Landscape changes and the effect of decollectivisation in the municipalities Rătești and Stăncuța (South-Eastern Romania) during the post-communist period (1989-now)

M. H. Snoeijer

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“To document is to interpret” - Jones, 1991

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Foreword

Landscape is a very interdisciplinary and integrative field of study. Historical geography or landscape history is a field of study that concentrates on landscape changes through space and time. It integrates several academic disciplines and fields of inquiry, such as economic and political geography, natural sciences, history, archaeology, sociology and ecology, in order to construct a detailed picture of landscape change. This master thesis emerged from this interesting field of study, as it was written in the light of the research master program Landscape History at the University of Groningen.

I have always greatly appreciated the interdisciplinary aspect of our master program Landscape History. It made studying very varied and diverse, and no gap in research seemed to be too deep, or too wide to bridge. This meant that possibilities and opportunities appeared to be endless. However, building bridges never happened overnight, and sometimes bridges collapsed before they could even be used. For an enthusiastic and ambitious student as myself, this meant that I tried to build bridges over and over again; not always knowing where the bridge would go. The first year of my master studies, I would built a bridge in a couple of months or even weeks. However, as my study proceeded, I experienced that doing research and writing a thesis is not a sprint, but a marathon in great need of focus and mindfulness. As an extremely active and fast-living personality, this has been quite the challenge, but also I am grateful to have learned this lesson so early in life.

The bridge you are looking at right now, is built on this enthusiasm and ambition, and emerged from the desire to study landscapes on international scale. After dr. Bas Pedrol and Theo van der Sluis MSc presented their European project ‘VOLANTE’ at a Summer School on Lesvos Island (Greece) in 2012, I saw opportunities to graduate on an international research topic. However, beforehand I would never have expected to end up in rural South-Eastern Romania in a RV, camping at the Danube river bank, and sailing the Danube river during fieldwork. I feel fortunate to have experienced this, thanks to a combination of such an interesting field of study, enthusiasm and ambition, coincidence of meeting the right people, and of course most important, the willingness of people to help me achieve my goals. Because building bridges is a process that cannot be done alone. This thesis research would have never been executed without the cooperation, input, interest and advice of people who were committed to help me and share their knowledge, skills and support with me.

First of all, I am in great gratitude for the help and support I received from dr. G.B.M. (Bas) Pedrol and T. (Theo) van der Sluis MSc from Alterra Research Center – Wageningen University. It is difficult to find the words to describe their effort in supporting me through the whole thesis process and beyond. My personal challenges were understood and respected; even supported. Their seemingly unconditional believe in a positive result of the project made sure that I also stayed positive and optimistic. Always after a meeting with them, I felt confident to continue the work. Not only because I had to, but also because I wanted to provide them with a good report in order to thank them for the time and energy they put in the project.

Second of all, I am in gratitude with prof. dr. ir. T. (Theo) Spek. This gratitude goes beyond this thesis project, as he has been my mentor during the whole master program. I would like to express my admiration for him as a professor and as a person. I am indebted to him intellectually, and in addition, I am in deep gratitude of how he helped me develop as a student, face the struggles and how he showed his support and understanding through the whole process. I feel privileged for having been his student, and for learning from him.

Third of all, I am also indebted to organizations connected with the research and with the regions in Romania, particularly the Department of Ecology of the University of Bucharest and Alterra Research Center (Wageningen University) through the VOLANTE project. Their (financial) support during the fieldwork in Romania is greatly appreciated. From the University of Bucharest, I would especially like to thank dr. G. (Georgia) Cosor MSc for her input, and sharing her knowledge and skills on the case study areas. Due to her willingness to show me the case study areas, and sharing everything she knows about them with me, I was able to execute this study. Also from the University of Bucharest, I would like to thank prof. dr. A. (Angheluta) Vadineanu for sharing his knowledge, and M. (Marius) Bujor BA for sharing his RV and beer with me on the Danube river bank during fieldwork, and his courage to manoeuvre the RV on roads that are not built for RV’s. Without his help, the 2013 maps will not have existed today. Mulțumesc!
Fourth of all, I would like to thank all experts that shared their knowledge through interviews and e-mail questionnaires. They were willing to discuss my research, and provide me with input and advice. Their input is seen during the whole process: with some of them I discussed the study when I didn’t even know where I was going, and with some of them I discussed the outcomes of the research. Either way, they have helped me form the thesis as it lies before you. My sincere gratitude and appreciation goes out to dr. L. (Leo) Paul University of Utrecht; prof. dr. D. (Dirk) Strijker, University of Groningen; dr. C. (Cornel) Micu, dr. K.M. (Karl Martin) Born, University of Vechta; prof. dr. C. (Cristian) Iojă, University of Bucharest; C. (Colette) van Werkhoven MA; A. (Alexandru) Gavrilidis MSc, University of Bucharest; dr. M. (Mihai) Nitja, University of Bucharest; dr. D. (Daniel) Müller, Leibniz Institute of Agricultural Development in Transition Economies; I. (Ionela) Carlinescu MA, Oprea Iorgulescu School. Special thanks go out to dr. K.M. Born, who has not only shared his knowledge with me in an interview, but also helped me formulate the interview questions, and was willing to be the second reader of the thesis.

Last of all, I would like to thank all the persons standing close to me for their sincere and unconditional believe in my ability to do this research and to write this thesis. Their collective faith in me has inspired me to have a little more faith in myself, and for this I don’t even have the words to express how greatly appreciated and needed this was (and is), and how grateful I am. For now, thanking them in this special section of the thesis is the least I can do. Thank you family (in special Karin, André and Inge), and thank you friends.

Merit Snoeijer, June 2014
Summary

Landscape research is particularly interesting in areas where rapid changes take place, as for example in Eastern Europe where the effects of the fall of communism and the developments in (agricultural) policy and land ownership led to rapid landscape change. However, a gap has been identified in landscape research. Existing studies that analyzed landscape changes in post-communist Eastern Europe focused either on large study areas, limited their study to only one aspect of landscapes (mainly land use), combined data from different sources that are difficult to compare, and did not assess changes over time. Also, when studying driving forces of landscape change, the studies focused on the driving forces as such, and not on the actual physical effects of the driving forces on landscape. As a result, the present study was designed to determine the landscape changes in Rătești and Stâncuța in rural South-Eastern Romania, and to analyze the effect of decollectivisation as driving force of landscape changes in these two municipalities for the post-communist period (1989 – present). This has been studied following the research question:

“How can the landscape changes in the municipalities Stâncuța and Rătești in South-Eastern Romania in the post-communist period (1989-present) be characterized, how did decollectivisation influence these landscape changes and how do these landscape changes relate to those studied in other post-communist landscapes in Eastern Europe?”

In order to characterize, compare and explain the post-communist landscape changes in South-Eastern Romania, eight landscape indicators have been selected based on the systems approach of landscape studies. Physical geography, land use, parcellation pattern, field boundaries, infrastructure, water system, settlement structure and land ownership have been studied using literature, land use statistics and interviews with (local) experts. The main source of the empirical case study research is a map analysis, based on topographic maps from 1900, 1980 and 1997, an aerial photo from 2003 and a map from 2013. The latter one has been created during extensive fieldwork in August and October 2013. In order to fully understand the changes and processes in South-Eastern Romania, the two case study areas have been compared to other case studies in Eastern Europe, extracted from literature.

Returning to the question posed, it is now possible to state that in the post-communist era the largest changes occurred in land ownership and fragmentation of fields. This has been caused by the major changes Romanian agriculture has undergone in the transition from a planned to a market economy starting the fall of communism in 1989. During communism, almost all land was nationalized, and taken from the former landowners. After the fall of communism, this land had to be returned to the previous owners – a process called decollectivisation. The land reform following the fall of communism aimed at the redefinition of private land property rights and was launched in 1991 with Law 18/1991. Within this Law, that was later on supplemented by Law 1/2000, the restitution of agricultural land to its former owners was organized. The most important effect of decollectivisation is the shift in land ownership. In both Rătești and Stâncuța land was restituted, resulting in ownership shifts and emerging a large amount of private- and corporate-owned farms. This resulted in a fragmentation of landscape, as the restituted parcels had an average of three hectares, spread over ten till twenty parcels scattered over the municipality. The restitution process was largely completed by 2004.

The study has shown that besides land fragmentation and shifts in land ownership, the decollectivisation process caused land abandonment, the degradation of irrigation and drainage systems and the decay of infrastructure. These changes correspond with some of the eight landscape indicators, namely land use, parcellation pattern, infrastructure, water system and land ownership. The two indicators not significantly affected by decollectivisation were field boundaries and settlement structure, because field boundaries already largely disappeared during the scaling in the communist era, and settlements neither increased nor decreased significantly in post-communist times. Furthermore, the analysis has shown that in both Rătești and Stâncuța, the trends concerning land abandonment have not been significant, whereas in other case study areas in Eastern Europe, land abandonment could consist up to 20% of the area. Moreover, in Rătești and Stâncuța, a trend has been observed in the last couple of years, where abandoned fields are cultivated again.

The study has shown that concerning land use, the changes are not that large in Rătești and Stâncuța, considering the long period of twenty-five years. The total change in land use in Rătești is...
around 11.6%. The total change in land use in Stăncuța is 14.3%. In Râtești, mostly pasture and forest changed into cropland, which involved large extended fields, mostly along the river from North-West to South-East. Also, grassland and forest expanded. In Stăncuța the agricultural land area expanded with approximately 2.5%. The settlement structures in the case study areas are very different. Where Râtești has mainly linear villages, Stăncuța knows more concentrated villages. However, both settlement structures remained largely the same during the last twenty-five years. A slight growth in built up area has been identified in Râtești (1.5%) and Stăncuța (0.2%).

The biggest difference between Râtești and Stăncuța is the clear division in Stăncuța’s landscape between the eastern part (large scale rice cultivation in the former flooding area) and the western part (small scale private plots). The landscape in Râtești is more uniform. Overall, the post-communist landscape changes in Râtești and Stăncuța are quite similar, and they seem to represent the average South-Eastern Romanian rural landscapes. Today, in both areas, the land use consists of a mixture of agriculture, pasture and forest and have a very open character.

All these trends in communist and post-communist times led to the disappearance of small scale landscape elements such as tree lines, field boundaries, and small roads and ditches. The study has found that in both areas, field boundaries are not physically present in the landscape. One of the more significant findings to emerge from this study is the influence of decollectivisation on the infrastructure and water systems. Study shows that in both areas, the respectively drainage- and irrigation systems were degraded after the fall of communism due to the disappearance of national management of the systems. However, there seems to be a stronger decay observed in Râtești than in Stăncuța. The main reason for this seems to be the large Italian investor which maintained the rice field cultivations and therefore also the water system accompanying this.

The study on landscape changes and the effect of a driving force such as decollectivisation on landscape change shows the importance of holistic landscape research. It is alarming that although landscape changes have been identified throughout the scientific community, holistic landscape research is lacking, especially in Eastern Europe. Land use and land cover are studied to a great extent, whereas studies on landscape (changes) in Eastern Europe are lacking. No study has been done on spatial patterns in landscape. Therefore it is recommended that future studies not only consider land use changes when they are referring to landscape research, but follow the approach suggested in this thesis, by studying landscape following the eight indicators as a framework. Gaining insight into the most recent landscape changes can benefit the decisions managers and politicians have to make concerning landscapes, to make sure valuable cultural heritage does not get lost.
Samenvatting

In Oost-Europa hebben de gevolgen van de val van het communisme en de ontwikkelingen in (landbouw) beleid en grondbezit geleid tot snelle landschapsveranderingen. Onderzoek naar landschap is met name interessant in gebieden waar soortgelijke veranderingen plaatsvinden. Echter, er bestaat een hiat in het huidige landschapsonderzoek. Bestaande studies die zich richten op onderzoek naar landschappelijke veranderingen in Oost Europa focussen zich voornamelijk op één aspect van landschap: land gebruik. Tot dit doel worden data uit verschillende bronnen die moeilijk te vergelijken zijn gecombineerd, maar worden de landschappelijke veranderingen over tijd niet onderzocht. Daarbij komt, dat wanneer de drijvende krachten (‘driving forces’) achter landschappelijke veranderingen onderzocht werden, de studies zich voornamelijk richten op de oorzaken en niet op het effect dat deze hebben op het fysische landschap. Hieruit voortkomend geeft deze studie inzicht in de landschappelijke veranderingen in Răteşti en Stăncuţa in Zuidoost Roemenië, en analyseert het effect van decollectivisatie als drijvende kracht achter deze landschappelijke veranderingen voor de postcommunistische periode. Dit is gedaan aan de hand van de onderzoeks vraag:

“Hoe kunnen de landschappelijke veranderingen in de gemeenten Răteşti en Stăncuţa in Zuidoost Roemenië in de postcommunistische periode (1989-heden) worden gekarakteriseerd, hoe heeft decollectivisatie deze landschappelijke veranderingen beïnvloed en hoe staan deze landschappelijke veranderingen in verhouding tot andere postcommunistische landschappen in Oost Europa?”


Terugkomend op de gestelde onderzoeks vraag is het nu mogelijk om te stellen dat de grootste wijzigingen in het postcommunistisch tijdperk zijn terug te brengen naar grondbezit en de fragmentatie van land. Dit is veroorzaakt door de grote veranderingen in de Roemeense landbouw in de overgang van een planeconomie naar een markteconomie na de val van het communisme in 1989. Tijdens het communisme was bijna alle grond nationaal (collectief) bezit, afgenomen van de vroegere grondbezitters. Na de val van het communisme werd dit land teruggegeven aan de vroegere eigenaren – een proces dat decollectivisatie wordt genoemd. De landhervormingen na de val van het communisme waren gericht op de herdefiniëring van particuliere rechten betreffende grondbezit, wat gelanceerd werd met Wet 18/1991. In deze wet, later aangevuld met Wet 1/2000, was de restitutie van grond aan de vroegere eigenaren geregeld. Hierdoor is het belangrijkste effect van decollectivisatie de verschuiving in grondbezit. In zowel Răteşti als Stăncuţa heeft dit proces plaatsgevonden, wat resulteerde in verschuivingen in eigendom en een opkomst van grote hoeveelheden particuliere en commerciële boerderijen. Dit leidde vervolgens tot een fragmentatie van het landschap, omdat boeren gemiddeld drie hectaren terug kregen, verspreid over zeven tot twintig losse percelen. Het restitutieproces was grotendeels voltooid in 2004.

De studie heeft aangetoond dat naast de verschuivingen in grondbezit die gepaard gingen met fragmentatie van land, het decollectivisatieproces ook landverlating, degradatie van irrigatie en ontwateringssystemen en het verval van infrastructuur heeft veroorzaakt. Deze veranderingen corresponderen met sommige van de acht landschapsindicatoren, namelijk landgebruik, verkavelingsspatroon, infrastructuur, watersysteem en grondbezit en kunnen verklaard worden dat het centrale management dat tijdens het communisme het onderhoud regelde, wegviel. De twee indicatoren die niet significant zijn beïnvloed door decollectivisatie zijn perceelgrenzen en het nederzettingspatroon. De perceelgrenzen waren al grotendeels verdwenen tijdens de schaalvergroting
Samenvatting

gedurende het communisme, en het nederzettingspatroon is nauwelijks veranderd gedurende en sinds het communistische tijdperk. Uit onderzoek is gebleken dat zowel in Rătești als in Stâncuța landverlating niet significant aanwezig was gedurende het postcommunisme, terwijl in andere case study gebieden in Oost-Europa dit soms op kon lopen tot 20% van het totale oppervlak aan landbouwgrond. Bovendien is in zowel Rătești als Stâncuța in de laatste paar jaar een trend waargenomen waarbij verlaten grond weer in gebruik is genomen. Dit wordt voornamelijk veroorzaakt door de toetreding van Roemenië tot de Europese Unie en de daarmee beschikbaar komende landbouw subsidies.

In het onderzoek is aangetoond dat de veranderingen in landgebruik in zowel Rătești als Stâncuța niet groot zijn, de lange periode van vijfentwintig jaar in acht nemend. De totale verandering in landgebruik is voor Rătești vastgesteld op 11,6%, en voor Stâncuța 14,3%. In Rătești hebben vooral in Noordwestelijke en Zuidoostelijke richting langs de Argeș rivier veranderingen plaats gevonden. Veel bos is veranderd in akkerland en het oppervlak grasland is uitgebreid, wat leidde tot grote uitgestrekte velden en een open landschap. In Stâncuța is de voornaamste verandering het afgietsel van de landbouwgrond met ongeveer 2,5%. De veranderingen hebben verspreid over de hele gemeente plaatsgevonden. Het nederzettingspatroon in de twee case study gebieden is zeer verschillend; Rătești kent voornamelijk lineaire dorpen en Stâncuța meer geconcentreerde dorpen. In beide gebieden is weinig veranderd in nederzettingen afgelopen vijfentwintig jaar. In Rătești heeft een groei plaatsgevonden van 1,5% en in Stâncuța een groei van 1,2%.

Het grootste verschil tussen Rătești en Stâncuța is de duidelijke scheiding in Stâncuța’s landschap tussen het oostelijke deel met grootschalige rijstteelt en het westelijke deel met kleinschalige kavels. Het landschap in Rătești is meer uniform. Over het algemeen lijken de postcommunistische landschappelijke veranderingen in de twee gemeenten zeer sterk op elkaar, en lijken ze agrarisch Zuidoost Roemenië te representeren. In het huidige landschap bestaat in beide gevallen het landgebruik uit een combinatie van landbouw, weiland en bos en hebben de twee gebieden een zeer open karakter.


De studie naar landschappelijke veranderingen en het effect van decollectivisatie op deze veranderingen laat het belang zien van dergelijk onderzoek. Het is alarmerend dat ondanks de landschappelijke veranderingen – met name in de bredere context van Oost Europa – holistisch landschapsonderzoek ontbreekt. Landgebruik en bodembedekking worden ruimschoots bestudeerd, terwijl studies naar landschappelijke veranderingen in al haar facetten in Oost Europa ontbreekt. Daarom wordt aanbevolen dat toekomstige studies niet alleen rekening houden met landgebruik, wanneer ze trachten het landschap en de landschappelijke veranderingen te begrijpen, maar alle acht indicatoren in analyse meenemen, naar voorbeeld van deze scriptie. Het verkrijgen van inzicht in landschappelijke veranderingen kan beleidsmakers, politici en managers helpen de juiste keuzes te maken met betrekking tot landschappen, om zo waardevol cultureel erfgoed niet verloren te laten gaan.
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1. Introduction

1.1. Background of the research

Concern about rapid landscape changes and the fear that essential landscape values might get temporally or permanently lost, is becoming a popular theme in international scientific publications and conferences (e.g. the Pan European Biological and Landscape Diversity Strategy and the European Landscape Convention). In 2007, Schneeberger and others wrote: “The context, direction, and rate of landscape change have varied over space and time. During the last decades, high rates of change, and related problems, have attracted the attention of policy and planning and raised the need to understand the causes of high rates of landscape changes.” The changes add new layers to the existing landscapes, and new landscapes replace the traditional ones gradually or sometimes abruptly, with the risk of losing cultural heritage and causing homogenization of landscapes. Landscape changes as part of historical geographical studies are particularly interesting in areas where man’s influence has caused rapid changes. This is seen in for example highly urbanized areas, or in areas such as Eastern Europe where the effects of the fall of communism and the developments in (agricultural) policy and land ownership lead to rapid landscape changes.

The landscape changes observed throughout Europe are accentuated in Central and Eastern Europe, as an effect on the important political and socio-economic changes that have taken place during the twentieth and early twenty-first centuries. After the fall of communism in 1989, the transition from a communist centrally-planned economy to a free market-oriented economy during the early 1990s led to the drastic changes. In relation to landscape and land use, Eastern Europe experienced an ‘intensive broad scale shock’ with the transformation. The changes were, according to Lakes, Müller and Krüger caused by “the collapse of state support for agricultural production, changing ownership structures, the emergence of additional income opportunities, benefits from EU agricultural policies and a new geographic mobility, which resulted in massive emigration from rural areas.”

Both land use and landscape were highly affected by the transformation from communist to free market-oriented economy. Therefore, these socio-economic trends are considered as driving forces of landscape change. Driving forces are defined as “the forces that cause observed landscape changes, i.e., they are influential processes in the evolutionary trajectory of the landscape.” For example, during communism, all land and agricultural production was state-owned and organized in large-scale collective and state farms during the forty years of communism, and after the collapse in most cases the land was given back to the former owners, a process called decollectivisation.

Blacksell: “Collectivization during the 40 years of communism destroyed many of the most distinctive pre-existing landscape features, in particular field boundaries, drainage systems, local track networks, mixed farming systems, including small-scale forestry, and a multitude of traditional farms buildings.” These landscape changes during communism have been identified in all Eastern European countries, although varying in time and scale.

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2 Schneeberger et al., 2007, pp.349-361.
6 Kueummerle et al., 2009, p.1.
9 Bürgi et al., 2004, p.858.
12 Blacksell, 2010.
Decollectivisation is one of the driving forces of landscape change in post-communist Eastern Europe. Decollectivisation is defined as ‘the breakup of large-scale agricultural production units into individually operated farms’.

After communism, the agricultural production assets were privatized and state and collective farms were dismantled. Land was given back to the pre-communist land owners. This restitution of collective farmland to former owners is the most common form of decollectivisation in Eastern Europe, although patterns differ substantially amongst and within the countries, as alternative systems had different effects on the landscape.

Modern landscape changes in Romania

Romania is a particularly interesting study area because its agricultural sector is among the largest in Eastern Europe and it is one of the most populous countries in Eastern Europe, with over 21 million inhabitants, in comparison with for example Bulgaria (over 7 million) and Albania (over 3 million). Romania is also rich in traditional cultural landscapes. The country has a varied and dynamic landscape with agriculture as one of the dominant land use types. There seems to be the idea that in this country the traditional rural landscapes still survive, while in more industrialized Western Europe they have mostly been erased by urbanization and industrial development. Within Romania, some distinction needs to be made, because some regions have entirely changed due to collectivization and other processes, whereas other regions have stayed traditional because they were not collectivized. The traditional cultural landscapes survive most strongly in for example Maramures in Northeast Romania.

By identifying, characterizing and analyzing landscape change in Eastern Europe, the consequences of the landscape changes are considered, and certain trends in landscape changes can be mapped. In Romania, land was decollectivized almost instantaneously after the fall of communism in 1989, with the land law of 1991. However, the restitution process took long. In 2009 about 77% of the property titles were being issued, corresponding to 85% of the land area that had to be restitutioned. As the rapid changes in Eastern Europe, and especially in Romania, are leaving its traces on the landscape, it is relevant to study what effect decollectivisation had on the landscape and why. The period after communism (1989 – present) is most relevant to this study, but also the impact of previous landscape changes is discussed, since they are still of influence on current landscapes, and the post-communist trends need to be understood in their historical context.

1.2. State of the art

The study of landscape as part of geography started to develop in the nineteenth and the beginning of the twentieth century. Different perspectives came to rise (and fall), and by 1975, researchers were concerned with the systematical study of landscape. It was in this year that Juneja developed a model that represents the analytical process to systematically trace the relationship between land use and processes of landscape. This model, also analyzed by Berger in his ‘Guidelines for landscape synthesis’ of 1987, follows a tradition of landscape studies by many researchers such as Maaye, Sauer, Hills, Glickson and McHarg. However, the models do not integrate any historical discussion, and landscape changes are not taken into consideration. A couple of years later, in 1988, Baker and Langton showed that historical geography and landscape research are closely linked. They state that both are a tradition of geography and emphasize on the time-space relationships in landscape research: “The description and analysis of landscape change through space and time is a

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15 Cremene et al., 2005; Palang et al. 2006.
16 Verburg et al., 2005, p. 39.
18 Luca, 2010.
fundamental part of geographical enquiry and landscape research. Here the interactions between pattern, process, structure and function are of particular interest, with the character and condition of landscape analyzed as the product of these relationships."²¹ This historical perspective is important in order to understand the current state of the landscape and to forecast future trends. By that time, spatial modelling was still poorly developed, because landscape change itself was still poorly understood.²²

Within the scientific specialization of landscape changes studies, a common spatial change study focuses on land use changes. Already in 1987 the relation was studied by Berger, who stated that “the analysis of land use-landscape relationships explains how concurrences of landscape features linked by natural processes enhance or retard human use.”²³ Haase et al. showed that studying land use changes by using historical periods gives the opportunity to indicate how land use affects landscape functions. They stated that “changes caused by land use gives an indication for the resulting state of the landscape and changes of landscape”.²⁴ The clearest distinction between landscape and land use studies is that land use studies focus on the function that has been given to a certain area of land, whereas landscape studies focus on the landscape system as a whole with interconnected areas. However, land use change over time has been a critical factor in the creation of landscapes and environmental conditions over large areas and is therefore an important indicator of landscape.

In the early 1990s, human geographers debated intensively over the term landscape: what it meant and what the proper use of it was.²⁵ They pointed out that a) the term landscape hides several layers of meaning; b) the term landscape contains several unsolved conflicts, such as collective control versus private ownership, objective versus subjective, mental versus material; c) the terms landscape and nature are interlinked; and d) landscapes can be understood only in their historic context.²⁶ The time-space relationship that in the earliest studies was missing, had now been identified as an essential aspect of landscape studies. In 2000, Feranec et al. introduced a new landscape change analysis approach.²⁷ This approach is based on seven landscape change types, based on land cover change databases. The difference between land use and land cover, is that land cover concerns the whole overlay of the earth, including for example built up area and roads, and land use concerns the effective use of a type of land cover, as for example agriculture and pasture.²⁸ The landscape change types that were identified in this approach are: 1) changes of meadows – pastures or forest to arable land, as well as changes of arable land to vineyards, orchards, berry plantations, greenhouse management, etc.; 2) extensification of agriculture; 3) urbanization (industrialization); 4) enlargement or exhaustion of natural resources; 5) afforestation; 6) deforestation and 7) other landscape changes.²⁹

A more recent study of Bürgi and Russell presented two integrative models to study landscape changes.³⁰ They vow for an interdisciplinary approach that integrates landscape ecology and history in order to study landscape changes. Their two presented models therefore facilitate this integration. The first method is designed to improve the communication between the disciplines landscape ecology and history by defining interface categories to talk more specifically about human impact on ecosystems.³¹ The second method is designed to compare patterns of change with regional differences in the human activities with potential impact on the case study. This method is referred to as double comparative study.³² Although the models are very beneficial for the interdisciplinary approach to the concept landscape, they are very theoretical and lack in support for studying physical landscape changes in case study areas.

²³ Berger, 1987, pp. 303-305.
²⁵ see e.g. Keisteri, 1990; Jones, 1997; Duncan, 1994; 1995.
²⁸ Antrop, 2007.
²⁹ Ferance et al., 2010, p.20.
Parallel to the theoretical and methodological developments in landscape studies and the discussions on the concept of landscape, also more practical (case) studies emerged. Models and maps on land use and land cover change based on remote sensing or satellite data were used in order to track the changes over time in larger areas. CORINE is an example of such land cover database derived from satellite images that covers Europe as a whole, which makes it popular in use.\textsuperscript{33} However, when looking in detail to the methodology of landscape studies, it is remarkable to see that many studies base their findings on only land cover and land use databases, leaving other aspects of landscape out of study. Also, CORINE land cover data is useful on European scale, but does not have a high accuracy and precision when it comes to national, regional or case study analysis.

An example of a study based on the CORINE database is the study of Vanwambeke, Meyfroidt and Nikodemus who studied the last twenty years of rural landscape changes in Latvia based on CORINE land cover data.\textsuperscript{34} Unfortunately, although they state to study landscape changes, their study does not give a definition of the concept landscape. Based on their methodology it can be concluded that the ‘landscape changes’ described in the study are not based on landscapes as a system, but only on land use and land cover as part of landscape.\textsuperscript{35} Another study entirely based on the CORINE land cover data is from Feranec et al., who studied changes and flows in European landscapes from 1990 – 2000.\textsuperscript{36} They stated in their publication that the presented results about land cover changes, strongly determine changes in the landscape. However, also Feranec et al. give no clear definition of landscape.

Since the beginning of landscape studies, discussions about the definition of landscape have been circling the scientific world. In 2007, a comprehensive and generally accepted definition of landscape was included in the European Landscape Convention: “Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”.\textsuperscript{37} Scientifically, there are more ways to define landscape, also depending on the interdisciplinary character of the study, and applicability of the concept for a certain study.\textsuperscript{38} Besides being material and being the result of a human-nature relationship, landscape is also a container-concept of many other disciplines, ideas and perceptions. For this study, the definition of the European Landscape Convention is followed, since this is one of the most comprehensive, broadly accepted and widely used definitions of landscape. The goal of landscape change studies would then be to understand the complex interactions between human and nature.\textsuperscript{39}

In 2012, Benoît et al. took a dive into the deep with a suggestion of a new field for addressing agricultural landscape dynamics: landscape agronomy.\textsuperscript{40} Agronomy is the main discipline committed to the study of farming systems and agricultural economy.\textsuperscript{41} Landscape agronomy is defined as: “the emerging perspective of agronomy focusing on the relations among farming practices, natural resources and landscape patterns, which are involved in the dynamics of agricultural landscapes.”\textsuperscript{42} The work of Benoît et al. arose from a debate on the role of agronomy in landscape research. They state that although landscape dynamics increasingly challenge agronomists to explain how and why agricultural landscapes are designed and managed by farmers, nevertheless, agronomy is rarely included in the wide range of disciplines involved in landscape research. The researchers therefore describe how landscape agronomy can help explain the relationship between farming systems and agricultural landscape dynamics.\textsuperscript{43}

One of the more recent and leading articles for studying landscape change is the study of Pinto-Correia and Kristensen on linking landscape research to practice. They study landscape as a basis for integrating social and ecological perspectives of the rural and present their results in a structured way.\textsuperscript{44} They propose new approaches to combine the different factors that shape spaces.

\begin{itemize}
\item \textsuperscript{33} E.g. Feranec et al., 2010, pp.19-35.
\item \textsuperscript{34} Vanwambeke, Meyfroidt & Nikodemus, 2012, pp.241-249.
\item \textsuperscript{35} Vanwambeke, Meyfroidt & Nikodemus, 2012, pp.241-249.
\item \textsuperscript{36} Feranec et al., 2000.
\item \textsuperscript{37} Council of Europe, 2000a.
\item \textsuperscript{38} See e.g. Sauer, 1925; Jones, 1991; Anttrop, 2007; Claval, 2005.
\item \textsuperscript{39} Bastian, Kröner & Lipsky, 2006, p.363.
\item \textsuperscript{40} Benoît et al., 2012, pp.1385-1394.
\item \textsuperscript{41} Benoît et al., 2012, p.1385.
\item \textsuperscript{42} Benoît et al., 2012, p.1386.
\item \textsuperscript{43} Benoît et al., 2012, p.1385.
\item \textsuperscript{44} Pinto-Correia, & Kristensen, 2013, pp.248-256.
\end{itemize}
“Recently, literature on the multifunctional character of rural spaces and their transition pathways shows the need for spatially based approaches where the natural characteristics of a landscape are combined with the socio-economic and cultural drivers that affect its changes.”

However, although all above mentioned research emphasizes the complex and multifunctional nature of landscape, the vast majority of the studies does not conceptualize or break up the concept of landscape in order to study it in all its facets. If they do break up and conceptualize landscape, it is mainly to argue for the study of one indicator of landscape (generally land use) as a determinant factor of landscapes as a whole.

*Eastern European landscape research*

The first serious discussions and analyses of landscape changes in communist Eastern Europe emerged at the end of the 1970s with works from Freeman concerning agricultural development and rural change. Thereafter, in 1985, Rugg studied Eastern Europe’s landscapes through different aspects such as settlement systems, architecture and the influences of different systems on the landscape (e.g. feudal system). After the fall of communism in 1989, much more publications on land use change became available, as more researchers focused on the effects of the past communist era on land use. For example, Hillman, Berentsen, Lieberman and Aghion focused on the developments in post-communist Eastern-Europe, and the effects on land use and more generally on agriculture. The landscape changes during the 1990s are best documented in terms of land use changes and their consequences, much less is known about changes in landscape during that period.

Subject of how to deal with land fragmentation and landownership as a consequence of decollectivisation became topical around the turn of the millennium. The United Nations Food and Agricultural Organization (FAO) adopted the fragmentation- and decollectivisation-issue and set out to publish a survey among Eastern Europe. This resulted in a seminar and the ‘Munich Statement’, in which congregated experts laid down guidelines for land consolidation activities as a contra movement to the observed land fragmentation in Eastern Europe: “Throughout most of Eastern Europe, agrarian structure post-communism is characterized by high physical fragmentation of land, and this is notoriously cited as one of the main constraints to farming”. Key researchers during the first years of the new millennium on these themes were Sabates-Wheeler and Bürgi.

The next phase of studies and publications came with the Eastern enlargement of the European Union, in 2004 (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia) and 2007 (Romania and Bulgaria). Especially themes as land fragmentation, decollectivisation and privatization were on a rise. Again, land use and land cover was studied to a great extent, whereas studies on landscape (changes) on Eastern European scale were lacking. The focus on these land use changes during the second half of the first decade is outstanding.

Kuemmerle, MüllerMüller, Griffiths and Rusu for example, highlight that in 2009, only two previous studies focused on the fate of landscapes in post-communist times: “Dezso et al. (2005) compared Global Land Cover Characterization (GLCC) and Moderate Resolution Imaging Spectroradiometer (MODIS) land cover, which showed an 18% forest cover decrease in a sub-catchment of the Tisza

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45 Pinto-Corcia, & Kristensen, 2013, p.248.
46 Freeman, 1979.
48 Hillman, 1992
49 Berentsen, 1992
50 Lieberman, 1993
51 Aghion, 1993
52 Palang et al., 2006.
53 Van Dijk, 2003, pp.3-4.
57 E.g. Müller & Sikor, 2006.
58 E.g. Kuemmerle et al., 2009.
River in northern Romania; Mihai et al. (2007), focused on alpine vegetation in a small study region in the southern Romanian Carpathians, examined Landsat images from 1986 and 2002, which showed only moderate changes, most notably the regeneration of vegetation on barren lands and secondary succession on grassland. By their knowledge, no study has been done on spatial patterns in landscape such as land abandonment, parcel structure, forest cover change, village structure or land fragmentation.

A study of Palang et al. focused on temporal diversity and rural landscape change in Central and Eastern European landscapes, using examples from Estonia, Hungary, Poland and Slovenia, which could also be, to some extent, applicable to Romania. It is seen as a piloting study on Central and Eastern European (CEE) landscapes, although focusing more on the discussion of the study of CEE landscapes, than on the landscapes itself. Therefore, the study is too limited. This leaves a gap in current research, because only little research has been focusing on CEE landscapes on case study level.

**Romanian landscape research**

Only a hand full of studies are found concerning Romanian landscapes. Like for example Rusu et al. who studied land fragmentation and land consolidation in the agricultural sector whilst using a case study in Romania. However, again, this is just a fragment of landscape research, and the case study is not covering all aspects that need to be studied in order to draw conclusions on landscape changes. Another example of this is the study of Griffiths et al. who presented a model on land use change by using time-series of satellite images to assess the effects of forest restitution in post-communist Romania. With satellite images, they discussed how the drastic post-communist institutional and socio-economic transformations affected forestry. They investigated how three phases of forest restitution affected forest disturbances. By doing this, Griffiths et al. derived annual disturbances maps along with recovery dynamics. The aim of the study was to use a trajectory-based change detection approach in order to assess the effects of the collapse of communism and the Romanian forest restitution on forest disturbances. Their study also highlights the value of temporal depth of the Landsat archive in order to record land use/cover change, providing new insight into the dynamics of land systems to better understand the effect of rapid changes in land use. However, its focus is on land use, rather than landscape.

**Case study research**

Case study research is not popular in landscape change research in Eastern Europe, but around the turn of the millennium, there was a growing body of case studies on landscape changes, with different aims, questions, and approaches. One of these studies is made by Hedins, who focused on land restitution in the former Swedish settlement areas in Estonia, and the consequences for land ownership, land use and landscape. It is one of the more rare studies of its time that focuses on landscape changes in Eastern Europe. In other regions in Europe, during the 2000s, there are more examples of landscape change case study research.

One of the best examples of Eastern European case study research on landscapes is the study from Bell et al. that focused on a case study in Latvia, where they studied several landscape elements in order to present an holistic image of the landscape changes. Bell et al. studied “topography (including geology), land use pattern (land use types and configuration, ecology, etc.), landscape

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59 Kuemmerle et al., 2009, p.2.  
60 Palang et al., 2006, p.347.  
61 Palang et al., 2006, p.347.  
62 Rusu et al., 2002.  
63 Griffiths et al., 2012, p.213.  
64 Griffiths et al., 2012, p.213.  
66 Hedin, 2005, pp.35-44.  
67 Bell et al., 2009.
scale, settlement pattern (traditional house types and location patterns), the cultural landscape character is informed by historical aspects, communication patterns and key features such as churches, castles, unique landform or historical events and persons.\textsuperscript{68} This represents the only study that focuses on multiple indicators of landscape. Also, the methodology has close links to landscape change research as historical maps, ortho-photographs and recent maps are used in combination with archival research and field survey.

An example of a landscape case study in Romania is the study on Arad County, Romania, concerning the changing Romanian village. Within this study, different aspects of the village such as cultural history, sociology, occupation and settlement pattern were used to describe the changes in Semlac, Romania.\textsuperscript{69} It concludes that the rural society degraded, leading to adjustments in the villages around the first transition years after 1989. After the first transition years, upheaval has been observed that gave signs that prosperity was beginning to return in the villages, as higher incomes from agriculture benefited the rural economy.\textsuperscript{70} Another example of case study research on landscapes in Romania is the study of Licurici, who studied the impact of humans on the landscape of the Danube floodplain in Romania.\textsuperscript{71} The researcher, however, despite using landscape in the publication’s title, presents a more environmental and ecological approach to studying landscapes in the floodplain. Another case study is the study of Dawidson based on 205 interviews with landholders from East and West Romania.\textsuperscript{72} It and provides insight in the redistribution of rural land. Although the study’s title suggests a spatial approach, the study’s main focus is on land statistics (ha of land, percent of agricultural land, amount of privately owned land) and the changes in time represented in the statistics. One of the main conclusions was that land reform produced a farm structure dominated by small subsistence farms with low levels of commercial activity.\textsuperscript{73}

Most local studies that focus on historical changes in landscape are not necessarily representative for large areas and cannot provide information on the aggregate impact of these changes at national or (Eastern) European level.\textsuperscript{74} On the other hand, the existing studies at national and (Eastern) European scale provide an overview of the main land use changes but fail to integrate the different processes of landscape change, and are conducted at such spatial and temporal scales that they cannot provide insight into the landscape changes on case study level.\textsuperscript{75} Therefore theory and methodology is needed in order to bridge the gap between local case study knowledge and larger scale national and (Eastern) European studies. Research should use local knowledge in order to develop a model that is applicable to more Eastern European landscapes.

**Driving forces of landscape change**

The study of driving forces of landscape change has a long tradition in geography and landscape research. However, since the turn of the millennium, landscape researchers started to study drivers of landscape change more systematically.\textsuperscript{76} Driving forces are defined as “the forces that cause observed landscape changes, i.e., they are influential processes in the evolutionary trajectory of the landscape”.\textsuperscript{77} For example, Brandt \textit{et al.} created an analytical framework to analyze the drivers responsible for landscape pattern dynamics (see Figure 1-1). By applying their analytical framework to three rural case studies, they conclude that technology, natural environment, socioeconomics, public policies and cultural values are the key driving forces in rural land processes. All major changes are caused by one or more of the five driving forces in their study, although the major drivers vary in space and time with the specific type of change.\textsuperscript{78} They conclude that in all three

\textsuperscript{68} Bell \textit{et al.}, 2009.
\textsuperscript{69} Ioan, 1996.
\textsuperscript{70} Ioan, 1996.
\textsuperscript{71} Licurici, 2010.
\textsuperscript{72} Dawidson, 2005.
\textsuperscript{73} Dawidson, 2005.
\textsuperscript{74} Bürgi & Russel, 2001; Tress \textit{et al.}, 2001.
\textsuperscript{75} Bürgi \textit{et al.}, 2004, p.40.
\textsuperscript{76} Wood and Handley, 2001.
\textsuperscript{77} Bürgi \textit{et al.}, 2004, p.858.
\textsuperscript{78} Brandt, Primdahl & Reenberg, 1999.
examples, public regulation including planning policy, together with economics is the biggest driving force of rural landscape change.79

Figure 1-1 Analytical framework representing the driving forces that influence rural land use structure dynamics. Source: Brandt, Primdahl & Reenberg, 1999.

One of the more recent and frequently used studies on driving forces is the study from Bürgi et al. in 2004. They give an overview on past, current and new directions in studies of driving forces and they identify five major types of driving forces: socioeconomic, political, technological, natural and cultural driving forces, based on earlier studies of Brandt, Primdahl and Reenberg from 1999.80 Besides categorizing the driving forces of landscape change, Bürgi et al. also discuss the characteristics of driving forces. They state that among driving forces there should be distinction between:

1) Spatial, temporal and institutional driving forces
2) Primary, secondary and tertiary driving forces
3) Intrinsic and extrinsic driving forces
4) Intentional and accidental landscape changes as result of driving forces.81

Combining the five categories of driving forces with the different characteristics of driving forces, the standard procedure to study driving forces of landscape change, as proposed by Bürgi et al. has been graphically displayed in Figure 1-2. The first step of the framework is system definition. This includes defining the study area and the grain of the study, the study period and the landscape elements of interest. The next step is called system analysis and it focuses on three subsystems, i.e., the change and persistence of physical landscape change, the actors and institutions and the driving forces. The last step is the system synthesis in which the actors, institutions and driving forces are linked in causal relationships and their impact on the landscape elements under study is determined. This last step stresses the function of landscapes as a system, more than the sum of its elements.82

79 Brandt, Primdahl & Reenberg, 1999.
80 Bürgi et al., 2004; Brandt, Primdahl & Reenberg, 1999.
81 Bürgi et al., 2004, p.859.
The most recent work on driving forces and landscape is from Pinto-Correia and Kristensen (Figure 1-3). They propose a conceptual framework in which the local rural landscape is seen as the meeting point between two axes, representing two types of drivers which evolve over time. The proposed framework highlights the increasing interplay between production and consumption of the countryside through the close local-level interaction between users of the landscape. The two axes correspond to separate approaches from the more traditional scientific disciplines, one related to natural sciences and the other related to social sciences. The various factors of the two axes are interconnected, and the boundaries between them are not fixed or clear; there is often a gray zone of interaction between the elements and processes within the various factors.

Figure 1-3 Model representing the drivers of landscape change divided between socio-economic and cultural drivers, and natural and structural drivers. Source: Pinto-Correia & Kristensen, 2013, p.253.

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84 Pinto-Correia & Kristensen, 2013, p.253.
*Eastern European and Romanian driving forces research*

More specific studies on Eastern European driving forces arose from the 1990s, like *‘Human impact on rural landscapes in Central and Northern Europe’* from Mander and Jongman.⁸⁵ In this decade the first studies on decollectivisation emerged, including studies on decollectivisation as a driver for land use change.⁸⁶ Although the political and socio-economic transition is generally recognized as an important driver of landscape change,⁸⁷ few studies have assessed landscape changes in the context of the post-communist transformation in Eastern Europe.⁸⁸ Also, the current driving forces studies focus mostly on driving forces as phenomena that influences land use change, but lack to study to what extent and in what form the driving forces affect landscape.

In the European project VOLANTE, of which two case studies are located in Romania, the Romanian driving forces are divided into several categories.⁸⁹ This division is based on an extended discussion amongst Romanian experts from national research institutes, universities, ministries and NGOs and also local experts such as land users. The following drivers were named:

<table>
<thead>
<tr>
<th>Driving forces</th>
<th>Effect of driving forces</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy (regulations)</strong> e.g. forest shelter belts (can also be economical factor)</td>
<td>Change of cadastral system; How policy is implemented – institutional development; Positive influence: protection of natural areas; Lobbying of pressure groups</td>
</tr>
<tr>
<td><strong>Funds</strong></td>
<td>Rural development funds - agricultural payments; Financial incentives – for prevention of land abandonment or extension of farms; Investments private (often takes more time); Government/European funding: (faster) on different activities.</td>
</tr>
<tr>
<td><strong>Climate change</strong></td>
<td>Drought and floods (extreme events).</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>Channels for irrigation; Micro electrical plants and networks; Wind mills; Roads (rural) and airport – leads to development; Buildings, urbanization, pipeline; Flood protection, water areas; Energy – infrastructure, biofuels.</td>
</tr>
<tr>
<td><strong>Land propriety</strong></td>
<td>More small, mostly subsistence farmers; Also big farms – more commercial; Different development of private and commercial enterprises; The transition from large state collective farms with intensive agricultural practices, towards the private owned farms, had serious impact on land ownership and management, and resulted mainly in cropland abandonment, land fragmentation and dominance of subsistence farms (1-5 ha).</td>
</tr>
<tr>
<td><strong>Farming practices</strong></td>
<td>More mechanization of agriculture – bigger farms; Farm improvement, proper use of irrigation; Diversification of farms: agro-fisheries; Changing crops for bio-energy and changing consumption patterns.</td>
</tr>
<tr>
<td><strong>Demographic – social culture</strong></td>
<td>Transformation of the socialist agricultural system (e.g. from a small number of large commercial farms to millions of households, family size farms. Abandonment of farming activities on land or return to the traditional agriculture); Rural population aging – migration. The decay of the industry in the cities and the high cost of life in the urban areas has generated as a consequence an urban-rural migration process that tends to amplify in</td>
</tr>
</tbody>
</table>

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⁸⁹ Jepsen et al., 2013.
the near future; moreover, the migration rate increased, since much of the area’s work force shifted to the European Union market).

<table>
<thead>
<tr>
<th>Consumer behavior</th>
<th>Globalization; Eco tourism; Consumer expectation; Cultural changes Migration.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-sustainable use</td>
<td>Deforestation; Irresponsible use, not complying with rules; Easy profit; Mining extraction; Environmental degradation; Pollution (domestic waste management not sufficient – tourism – intensification); Tourism – negative influence on nature (infrastructure).</td>
</tr>
<tr>
<td>Economy</td>
<td>Land abandonment; Market prices.</td>
</tr>
</tbody>
</table>

*Table 1.1 Drivers of land use change and their general effects related to land use identified for the VOLANTE project in Romania. Source: VOLANTE meeting in Bucharest, October, 2011.

Decollectivisation as driving force of landscape change

Towards the end of the 1990s, and at the beginning of the decade thereafter, much literature has also focused on decollectivisation as a driving force of landscape change.\(^{90}\) Decollectivisation is a primary process that influenced the landscape directly, but also through constituent processes. It can be traced back to the socioeconomic and public policy driving forces from the study of Brandt *et al.*\(^{91}\), and to the socioeconomic and political driving forces of Bürgi *et al.* For the period after the fall of communism (1989 onwards), changing land ownership, agricultural reform policies and new land laws have been identified as the most important driving forces of landscape change.\(^{91}\) Following form this, this study analyzes the effect on landscape change of the primary process decollectivisation from which these driving forces emerge.

Gaps in research

Research on Eastern European landscape changes during the last twenty-five years focused on different aspects of landscapes with main publications coming from ecological, land use, economic-geographical and political perspectives. This is reflected in the journals. Journals who published most articles on Eastern European post-communist landscapes are *Landscape and Urban Planning, Landscape Ecology, Applied Geography, Land Use Policy*, and *World Development* (Table 1.2). Besides that, it is remarkable how many other journals have paid attention to the topic, as all the other articles on this topic are spread among a wide variety of other scientific journals. Most articles have been published in the first decade of the century, with a peak after the European Union expanded in eastern direction (2004 and 2007).


\(^{91}\) E.g. Aligica & Dabu, 2003.
Existing studies that analyzed landscape changes in post-communist Eastern Europe focused either on large study areas, limited their study to only one aspect of landscapes (e.g. land use), combined data from different sources that are difficult to compare (e.g., historical maps and satellite imagery), or did not assess changes over time.\textsuperscript{92} The most important gap in research concerns the gap between landscape and land use research. The concept of ‘landscape’ is used many times in publications, but when looking deeper into the study, the concept is mostly only studied from one aspect of landscape: land use. Relatively few studies have assessed landscape changes in the context of the post-communist changes in Eastern Europe. An explanation might be that landscape data covering the whole area of study is missing, causing researchers to use easy accessible land use data (e.g. CORINE) repeatedly, and other data such as maps, statistics and agricultural censuses are partly missing and differ in scale and accuracy.\textsuperscript{93}

As mentioned above, the driving forces underlying landscape change have been studied intensively since the turn of the millennium.\textsuperscript{94} However, studies focus on the constituent processes concerning driving forces, rather than the actual physical effects of driving forces on landscape change. The bridge between driving forces and landscape change has not yet been built, as far as the analysis of over a hundred on-topic publications has shown. The publications focus more in depth on the drivers itself and the fact that they influence landscape somehow, rather than connecting the drivers to the actual physical changes in landscape. Especially case study research is missing, in order to provide the analysis of driving forces on landscape changes with deeper insights. The studies are merely theoretical suggestions for real life situations.

### 1.3. Research themes, research period and research area

The problem definition of the thesis concerns landscape changes and decollectivisation as driving force of landscape changes. It has been observed and discussed in paragraph 1.2 that research on the effects of decollectivisation on landscape change on case study level in Eastern Europe is lacking. The study focuses on a period of time in which major changes are reflected in the landscape. Unquestionably, all elements of the system under change have a historical dimension. Not only landscapes are subject of change, but also the driving forces itself.\textsuperscript{95} The focus period of study is the post-communist period, starting in 1989 with the fall of communism, until present (2013); roughly the last 25 years. The choice of this period has emerged from literature analysis, in which it became clear that the last twenty-five years have had a very strong influence on landscape changes due to the rapid socioeconomic and political changes. To put the post-communist landscape changes and

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|c|c|c|c|}
\hline
 & no. & & & & & & & \\
\hline
Land use policy & 9 & 2 & 2 & 1 & 1 & 3 & & \multirow{2}{*}{1992, 1987} \\
Landscape and Urban Planning & 9 & 1 & & & & & & \\
Applied Geography & 3 & 1 & 1 & & & & & \\
World Development & 3 & 1 & & & & & & \\
Remote Sensing of Environment & 2 & 1 & & & & & & \\
Other journals & 26 & 1 & 6 & 4 & 3 & 1 & 4 & 2 & 1 \\
\hline
Total articles & 56 & 5 & 11 & 6 & 10 & 2 & 11 & 2 & 3 & 6 \\
\hline
\end{tabular}
\caption{Amount of analyzed papers on Eastern European post-communist landscapes per journal and over time.}
\end{table}

\textsuperscript{93}Kuemmerle et al., 2009, p.450.
\textsuperscript{94}Bürgi et al., 2004; Pinto Correia et al., 2013.
\textsuperscript{95}Bürgi, Hersperger & Schneeberger, 2004.
Introduction
decollectivisation issue into perspective, also the communist time (using maps from 1980) and the original cultural landscape from pre-communism (using maps from 1900) are taken into consideration.

Information on landscape changes cannot be limited to the study of general data (high scale maps, statistics, etc.), but requires focused case studies to identify and describe the landscape changes in different regions. Therefore, in-depth case studies are presented to provide a deeper analysis. The analysis complements the macro analysis at regional (South-Eastern Romania, two cases), national (Romania) and international scale (Eastern Europe). As cases, Stâncuţa and Răteşti municipality were selected by the European Union project ‘VOLANTE’, because the regions are characterized as representational rural post-communist landscapes. Moreover, the areas are identified as heterogeneous farming structures ranging from mainly small-scale farms in Răteşti to relatively large agricultural enterprises in the Stâncuţa Danube river-plain. Both regions are representative for the South-Eastern part of Romania, and in both regions, agriculture is the most important land use. For both municipalities additional maps and statistics can be found in the Appendices. The GIS files, fieldwork photos and additional data can be found on the attached DVD.

Răteşti is a municipality in Argeş County dominated by agriculture. This is represented by a landscape with an open character in which over 80% of the total area is occupied by cereal and vegetable crops. The municipality has a land area of of 80 km². The municipality covers seven villages: Răteşti, Tigveni, Pătuleni, Furduleşti, Ciupa-Mânciulescu, Nejlovelu, Mavrodolu, with a population of approximately 3300 people. There are two rivers with east-west orientation within the municipality: Argeş and Neajlov rivers. The capital of Argeş county, Piteşti, is located twenty kilometers northwest of the municipality, with direct access through a highway. Stâncuţa municipality (an area of 250 km²) is also dominated by agriculture, representing a very open landscape. About two-third of the area is arable land. It is located alongside the Danube river, in a former flooding area. Stâncuţa is located 45 kilometer south of the county capital Brăila. The municipality covers four villages: Stâncuţa, Stanca, Polizeştii and Cuza-Vodă, with a population of 3800 inhabitants. This study focuses on the cultivated and intensively used landscape west of the Danube river. However, concerning statistics, the whole municipality is taken into consideration.

96 Kuemmerle et al., 2009, p.2.
97 Kristensen et al., 2012; Kristensen et al., 2013; Sluis et al., 2013; Cosor et al., 2012.
98 Kristensen et al., 2012; Kristensen et al., 2013; Sluis et al., 2013; Cosor et al., 2012.
99 Kristensen et al., 2012; Kristensen et al., 2013; Sluis et al., 2013; Cosor et al., 2012.
100 Kristensen et al., 2012; Kristensen et al., 2013; Sluis et al., 2013; Cosor et al., 2012.
101 Kristensen et al., 2012; Kristensen et al., 2013; Sluis et al., 2013; Cosor et al., 2012.
Introduction

Land Cover 2013 in Rătești municipality

- Arable land
- Pasture
- Forests
- Natural vegetation
- Permanent crops - Orchards
- Rivers - Channels
- Lakes - Ponds - Reservoirs
- Built up area
- Roads - Railroads

1-4 Land cover and topography of Rătești municipality in 2013, with the location of Rătești in Romania in the insert map.
Land Cover 2013 in Stăncuța municipality

- Built up area
- Roads, railroads
- Natural vegetation
- Rivers, channels
- Forest vegetation
- Pasture
- Agriculture

1-5 Land cover and topography of Stăncuța municipality in 2013, with the location of Stăncuța in Romania in the insert map.
1.4. Problem definition, research aim and research questions

Up until now, drivers of Eastern-European land use and landscape change at broad spatial scale have been studied, but studies linking the driving forces to actual and physical landscape trends on case study level are lacking. The studies that focus on land use changes mainly use remote sensing methods, satellite mapping methods or other models for image classification, and land use map comparison.102 In order to study landscape change, a more comprehensive approach is needed, also focusing on other indicators besides land use that together form landscape. There is a need for more case study research, focusing on landscapes as a whole, and the influence of driving forces on the physical landscape. This study therefore aims at analyzing post-communist landscape changes and decollectivization as driving force of landscape change, in two case study areas in Romania, Eastern Europe. Secondary aim is to propose a more structured framework for case study research on landscape changes and decollectivization as underlying driving force. The observed gap is supported by several studies, giving the current study background and motives, legitimizing underlying study and providing it with a scientific basis.

To analyze the landscape changes and underlying driving forces in two cases in post-communist Romania, the following central research question has been formulated:

“How can the landscape changes in the municipalities Stâncuţa and Răteşti in South-Eastern Romania in the post-communist period (1989-present) be characterized, how did decollectivisation influence these landscape changes and how do the landscape changes and the influence of decollectivisation relate to those studied in other post-communist landscapes in Eastern Europe?”

In order to answer this question, the study has been divided into two parts, focusing first on landscape and landscape change, and second on decollectivisation as driving force of landscape change. The broader Eastern European context is discussed within these two themes. The two parts are divided into sub-questions, focusing on describing, comparing and explaining the post-communist landscape change phenomena in Stâncuţa and Răteşti in South-Eastern Romania.

Part I: Landscape change
How can the landscape changes in the municipalities Stâncuţa and Răteşti in South-Eastern Romania in the post-communist period (1989 to present) be characterized and how do these landscape changes relate to those studied in other post-communist landscapes in Eastern Europe?
1) How can the post-communist landscapes and landscape change (1989-present) of Răteşti and Stâncuţa in South-Eastern Romania be characterized based on a set of indicators?
2) What are the differences in post-communist landscapes and landscape change (1989-present) of Răteşti and Stâncuţa and how do they relate to other case studies from Eastern Europe?

Part II: Decollectivisation
How did decollectivisation influence the landscape changes in post-communist Răteşti and Stâncuţa (1989 – present) and how does the influence of decollectivisation on landscape change in Răteşti and Stâncuţa relate to other post-communist landscapes in Eastern Europe?
1) How did decollectivisation influence the post-communist landscape changes (1989-present) in Răteşti and Stâncuţa in South-Eastern Romania?

102 E.g. Palang et.al., 2006; Václavík & Rogan, 2009; Lakes, Müller & Krüger, 2009; Kuemmerle et.al., 2009; Vanwambeke, Meyfroidt & Nidodemus, 2012.
2) What are the different primary and constituent processes concerning decollectivisation and what were the effects of the processes on post-communist landscape change (1989-present) between Răteşti, Stăncuţa and other landscapes in Eastern Europe?

3) How can the different constituent processes and effects of decollectivisation on post-communist landscape change (1989-present) of Răteşti, Stăncuţa and other Eastern European cases be explained?

1.5. Theoretical framework

The State of the Art and the Theoretical Framework are seen as a contribution to the construction of a framework in which this thesis research is executed. The State of the Art showed the popularity of land use and landscape research in post-communist Eastern Europe. It discussed the different trends in research, and showed the existing gaps and science challenges on the effects of driving forces on Eastern European landscapes. Up until now, no study has focused on post-communist landscape changes and decollectivisation as underlying driving force in Romania, while the need for this is so high as landscape changes quickly. Land fragmentation and land consolidation are on the one hand realistic threats to authentic cultural landscapes but on the other hand also to agricultural yields and therefore also for a viable economy. Although the now existing theories do not present any overarching theory on driving forces on landscape change on case study level in Eastern Europe, they do provide building blocks for the below presented conceptual model for this study. Both parts (landscape and decollectivisation) are integrated in a newly proposed model (Figure 1-6). The conceptual model structures the relationships between landscape indicators, landscape change (processes) and decollectivisation.

![Conceptual model for Eastern-European landscape change and decollectivisation as driving force used in this study.](image)

**Landscape indicators**

Landscape in this study has been identified as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’. A traditional, broadly used and generally accepted way to study the landscape is based on its main characteristics, so called

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103 Council of Europe, 2000a.
The use of landscape indicators is becoming increasingly common and popular in landscape assessment, as both the Organization for Economic Co-operation and Development (OECD) and the United Nations promoted environmental indicator research. Landscape indicators are based on the physical and visual (‘as perceived by people’) characteristics of the landscape. An example of indicator research is the study of Bell et al. who study landscape indicators in a case study area in Latvia. Using landscape indicators has its roots in a systems approach to landscape change. This approach describes that in order to study the state of the landscape and the processes within the landscape, landscape systems can be decomposed into functional components, which can then be studied. The most popular landscape indicator for study is land use, as has been seen in the State of the Art. The eight landscape identified indicators for this research are tested in the case study areas Rătești and Stăncuța in Romania, and provides insight into the process of post-communist landscape changes. The following indicators are most relevant for the purpose of this study: Physical geography, land use, parcellation pattern, field boundaries, infrastructure, water system, settlement structure and land ownership.

1) Physical geography.
Physical geography is described by means of location, soil, bedrock, elevation and original vegetation.

2) Land use.
Land use is defined as the spatially and time specific expression of land use or natural vegetation. It includes a full range typology of natural features (e.g. Forest, marsh), semi-natural or fully agricultural situations (e.g. Grassland, orchards, arable land), and artificial land (e.g. Built up area, infrastructure). Land use has been built up by: arable land; meadows and pastures; vineyards; permanent crops (other than vineyards) and orchards; mixed cultivation pattern; built up area including yards; forests; natural vegetation such as grassland or land covered with reeds or rushes, marsh vegetation; rivers and channels; lakes, ponds and reservoirs; and roads and railroads.

3) Parcellation pattern.
Parcellation pattern reflects the physical conditions related to the spatial and temporal aspects of human land use (e.g. use of management technique, field size). It consists of the structural characteristics related to land use.

4) Field boundaries.
Field boundaries are strongly related to land use and parcellation pattern. They are linear and punctual landscape elements, mostly small scaled. For example: tree lines, fences, shrubs, small ditches and roads. They are the boundaries of man’s division of the land for productive use.

5) Infrastructure.
Infrastructure includes roads (primary, secondary and trails) and railroads.

6) Water system.
Water system is described according to (the pattern of) rivers, channels, ponds, reservoirs, lakes, drainage- and irrigation systems.

7) Settlement structure.
Settlement structure is represented in the villages and their structures in the landscape; the visual imprint made by man on the countryside in the process of occupancy. It includes settlement pattern, or distribution of farmsteads.

8) Land ownership.
Land ownership is any land that is owned by a person or entity.

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106 Bell et al., 2009.
108 Mücher et al., 2003, p.23.
109 Mücher et al., 2003.
Decollectivisation as driving force

Although the proposed standard procedure to study the driving forces of landscape change as suggested by Bürgi et al. is interesting for studying the causal relations between driving forces and landscape processes, it does not assess the effects of the driving forces on the actual physical landscapes. The procedure focuses on identifying and analyzing the relations between the phenomena, rather than the actual physical changes. Therefore, a model is proposed that puts more emphasis on the physical landscape than on the causal relationships between driving forces and landscape. One way to do this, is to avoid the study of actors of driving forces when studying landscape change. In this model, the Driving Forces – Change model, it is assumed that driving forces directly cause the observed land change: “In the Driving Forces-Change model, the causal relationship between driving forces and land changes is not of prime interest. (...) Linking land change directly to driving forces is probably the most commonly used approach in land change science. Most research based on this model searches for correlations within large, spatially explicit data sets of potential explanatory variables.”

When eliminating the actors from the model of Bürgi et al., and when shifting the observations on landscape change to the system definition, the below Figure 1-7 follows more accurately the division between firstly studying landscape and second driving forces, in order to come to the synthesis. Moreover, the arrows are reverted, as the driving forces influence landscape change, and not the other way around, as can be wrongly interpreted from the model of Bürgi et al.

This study focusses on decollectivisation as driving force of post-communist landscape change. The study of Bürgi shows that studying driving forces of landscape changes in all its facets is important in order to provide a holistic picture of the cases. However, in this study it has been chosen to focus only on decollectivisation as a driver of landscape change, as this has been identified as one of the primary drivers of post-communist landscape change (see State of the Art). Bürgi et al. emphasized that it is appropriate to limit a study to a subset of driving forces which are thought to be most important for understanding landscape changes of interest.

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112 Hersperger & Bürgi, 2007; 2009; 2010; Hersperger et al., 2010, p.3.
113 Bürgi et al., 2004.
114 Bürgi et al., 2004.
Introduction

Figure 1-8 Simplified model of decollectivisation as driving force of the different landscape indicators in the case study area, as decollectivisation influences the landscape changes over time.

1.6. Sources and Methods

Processes of landscape change are hard to trace, due to different temporal and spatial scale, the different trajectories of landscape change in different regions, and the fragmented and little data available. Also, landscape studies integrate several academic disciplines and fields of inquiry, such as economic and political geography, natural sciences, history, archaeology, sociology and ecology, in order to construct a detailed picture of geographical change.\(^{115}\) By working interdisciplinary, and integrating data and research methods, the landscape synthesis shows the relationship between phenomena and processes and not simply display a group of studies, all about the same place.\(^{116}\) This approach is necessary to fully grasp the complexity of landscapes.

The objective of this research design is to provide the study of a technical and specific framework on the data collection and analytical methods applied and quality of the data. Here below a short overview of the used sources is presented. A complete list of the sources is added with the bibliography at the end of this thesis.

The landscape changes in South-Eastern Romania are studied using maps available for several periods. When using maps, trends and changes can be observed in the landscape structure. Maps from 1910 (shows the situation around 1900), 1980, 1997 and 2003 (digitized aerial photo) are used, although at different scales and to different degrees of accuracy. The present land use and landscape structures were mapped from extensive fieldwork in October 2013, based on the 2003 digitized aerial photo, creating an additional map of the 2013 situation.

The 1980 topographic maps are scaled 1:25 000, and compiled by the Military Topographic Direction in 1979 for Râşcoaia 1980-1981 for Stâncea (referred to as 1980 maps). Because the civil applications in Romania used the Stereo 1970 projection, the analogue maps were compiled in a mosaic of images geo-referenced in Stereo 1970, and not in the original Gauss-Krüger. All the maps that cover Râşcoaia and Stâncea were clipped and merge into a mosaic. The same has been done for the 1997 and 2003 maps. After geo-referencing the maps and clipping and merging them into a GIS,

\(^{115}\) Turnock, 1993, p.83.
the maps were manually digitized. To allow overlaying and processing of the data. Spatial data processing and analysis of the transformation of land use and landscape was carried out using ArcMap GIS (ESRI GIS software).

All maps were digitized into points, lines, polygons. The original 2003 digitized map has been checked and updated by laying a grid over the map, and consequently checking all grid-compartments. The editing of the 2003 digitized map was done at a 1:5 000 scale in order to safeguard the right amount of detail and accuracy. For creating a map of the landscape in 2013, a grid of approximately four by four kilometer was laid over the 2003 aerial photographs. This made working in the field on higher detail and accuracy possible. The fieldwork and digitalization of the 2013 situation has been executed in October and November 2013. Pictures were made during fieldwork to support the mapping materials and as a reference of the landscape condition at that time.

The land use categories for the digitized maps (1980, 1997, 2003 and 2013) are:

<table>
<thead>
<tr>
<th>GIS abbreviation</th>
<th>Land cover categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA</td>
<td>arable land</td>
</tr>
<tr>
<td>PP</td>
<td>meadows and pastures</td>
</tr>
<tr>
<td>VI</td>
<td>vineyards</td>
</tr>
<tr>
<td>CP</td>
<td>permanent crops (other than vineyards) - orchards</td>
</tr>
<tr>
<td>MX</td>
<td>complex cultivation pattern</td>
</tr>
<tr>
<td>CC</td>
<td>built area, households, yards with complex cultivation pattern</td>
</tr>
<tr>
<td>PA</td>
<td>forest vegetation, shrubs, bushes</td>
</tr>
<tr>
<td>HN</td>
<td>natural vegetation, grassland or land covered with reeds or rushes, marsh vegetation or rare rows of trees and shrubs that cannot be used as pasture or meadows</td>
</tr>
<tr>
<td>HR</td>
<td>rivers, channels (running waters)</td>
</tr>
<tr>
<td>HB</td>
<td>lakes, ponds and reservoirs</td>
</tr>
<tr>
<td>DR</td>
<td>roads, railroads</td>
</tr>
</tbody>
</table>

Table 1.3. Land cover categories used in the digitized land cover maps of 1980, 1997, 2003 and 2013.

To define, characterize and explain decollectivisation as driving force of landscape change in Râtești and Stâncuța, it was crucial to find ways to combine qualitative and quantitative data, as also has been stated by Bürgi et al.\textsuperscript{117} The driving forces of landscape changes in the region were quantitatively studied using statistics, following a study of Nikodemus, Bell, Grine & Liepiņš.\textsuperscript{118} Additional statistics were used for studying the land use changes, extracted from:

- Romanian Statistical Yearbooks;
- agricultural statistics Romania of the Ministry of Agriculture;
- data on changing landownership;
- statistics from the VOLANTE questionnaire among farmers (especially information on landscape changes in the last decade).

Statistics on the two case study areas concern livestock, crops and land use (ha). Statistical analysis was carried out using MS Excel. For studying the changes in landscape, the percentages represent a decline or increase in relative percentage-POINT. This means that a decrease from for example 40% to 20% is not 50% decrease, but a decrease of 20% (percentage-POINT). The data and graphs are found in Appendix IV and on the attached DVD.

Information from the different data sources was supplemented with information from in-depth interviews with (local) experts from Romania, Germany and the Netherlands to explain and fully grasp the observed trends in both landscape changes and decollectivisation. To create insight into decollectivisation as driving force of post-communist landscape changes in South-Eastern Romania the interviews focussed on a) post-communist landscape changes, b) decollectivisation, and

\textsuperscript{117} Bürgi et al., 2004, p.865.
\textsuperscript{118} Nikodemus et al., 2005, pp.57-67.
c) the influence of decollectivisation on landscape change. The experts were selected on their expertise and knowledge of physical geography, human geography, ecology, agronomy and landscape (changes). The total list of interviewees is found in appendix V.

For the empirical study, a semi-structured list of interview questions has been used to give a certain direction to the interview, but also give the interviewee the opportunity to present findings freely. This semi-structured way of interviewing has also been chosen because there was too little information known about the topic discussed to generate a completely structured interview. Because qualitative research was used for this study, the interview data cannot be generalized to other regions than the regions discussed. In addition, although the interviewees are experts on landscape changes and the decollectivisation issue, they have never executed research in Rătești and Stănucuta, with exception of dr. G. Cosor MSc, prof. dr. A. Vadineanu and dr. C. Micu. Therefore it needs to be acknowledged that the data provides mainly general information on decollectivisation as driving force of landscape change in South-Eastern Romania. However, the data adds value as it was continuously compared with the theoretical data and the other sources and methods used for analysis.

The results from the case study research are compared to results from other Central and Eastern European cases from literature. The choice of former communist case study areas was based on an analysis of comparable countries. Four countries are analyzed in-depth, using several published case studies. Complementary to this, the study of Hartvigsen on all twenty five Central and Eastern European countries has been used providing a broader framework and theory for study. First country under study is Latvia, which is analyzed using three studies: 1) Vanwambeke, Meyfroidt and Nikodemus from 2012, focusing on the rural landscape changes in Latvia in the last twenty years. 2) The study of Bell, Nikodemus, Penee and Kruze from 2009 on the management of cultural landscapes in Latvia. And 3) The study of Nikodemus, Bell, Grīne and Liepiņš from 2005 on the impact of economic, social and political factors on the landscapes in Latvia. The second country under study is Estonia, for which findings from a study of Palang, Mander and Luud are used, focusing on landscape diversity changes in Estonia. The third country is the Czech Republic. The study of Bičík, Jeřeček and Štěpánek on land use changes and their social driving forces, and the study of Václavík and Rogan on identifying trends in land use/land cover change form the basis of this case study analysis. The last and fourth presented case study is Albania, for which a study of Müller and Sikor on effects of post-socialist reforms on land cover and land use is used. These four case studies areas correspond with the cases presented in this study, as the publications focus on (aspects of) landscape change and/or decollectivisation as driving force of landscape change. However, none of the publications study landscape in a comparable systematic way as presented in this study using landscape indicators.

120 Bryman, 2008.
121 Hartvigsen, 2014.
123 Bell et al., 2009, pp.425-455.
124 Nikodemus et al., 2005.
1.7. Outline of the thesis

The study is roughly divided into three phases. First, a thorough literature review forms the theoretical and methodological basis of the study. This review offers an overview of the existing knowledge and the gaps therein for the two main subjects of this thesis: landscape changes and decollectivisation as driving force of landscape change. Second, in South-Eastern Romania, fieldwork, statistics, map analysis and in-depth interviews with (local) experts provided the thesis with original data on the subject. Third, both the strong literature framework and the empirical data is integrated in order to present an interdisciplinary answer to the research questions stated for this thesis study.

The report is structured as follows. Part I of the thesis focuses on characterizing, describing and comparing the landscape changes in Răteşti and Stâncuţa. Part II of the thesis focuses on describing, comparing and explaining decollectivisation as driving force underlying the landscape changes in Răteşti and Stâncuţa. Within both parts, the findings of the case studies are placed in a broader Eastern European context, describing other cases in Eastern Europe, comparing them with Răteşti and Stâncuţa, and explaining the differences and similarities. After covering the two parts of the thesis, a discussion, conclusion and recommendation rounds up the thesis. The overall design of the three parts of the thesis research is shown in Figure 1-10 below.
Figure 1-10 Schematic overview of the outline of the thesis. Landscape changes in the two case study areas are explained with an analysis of decollectivisation as driving force of landscape change, and put into a broader Eastern European context by analysis of literature on other Eastern European case studies.
PART I: Landscape change

Scientific case studies on post-communist landscape change in Eastern Europe, including South-Eastern Romania, are scarce. Therefore, this part of the thesis presents a study of South-Eastern Romanian rural landscape changes, studied through Rătești and Stăncuța cases. The two case studies are described and compared, also in broader Eastern European context. Explaining decollectivisation as driving force of landscape change is done in the second part of the thesis.
2. Traditional cultural landscapes in South-Eastern Romania around 1900

2.1. Introduction

Landscapes are the product of the interaction between humans and nature, as seen in the Introduction. As landscapes are the result of series of preceding historical processes, not only the landscape changes since the fall of communism are taken into consideration, but the preceding developments during pre-communism (Chapter 2) and communism (Chapter 3) are also shortly discussed. The pre-communist reference landscape provides the basis for further change-analysis: the starting point. It has been chosen to describe the cultural landscape around 1900, as mapping material from 1900 – 1940 is available, complemented with findings from literature and interviews. The maps can be considered as a representation of the situation before the start of massive human intervention.129 Also, the period around 1900 represents an already strong agricultural character due to population growth, successive land reforms and technological process during the nineteenth century, but has not yet been radically changed due to the political changes in the twentieth century.130 These political changes and their effect on landscapes are the strong 'productivist' agrarian landscapes during communism 1947 – 1989 and the radical land reform after the fall of communism in 1989, discussed in chapters two and three.131

2.2. General cultural landscapes in (South-Eastern) Romania around 1900

The initial stages of development of the cultural landscapes in (South-Eastern) Romania originated far before 1900. From origin almost three-quarters of Romania’s land area was covered by forest (primarily Oak and Spruce).132 The fourth-quarter was considered steppe grassland, wetland and subalpine/alpine zones. Already from Neolithic times (ca. 11,000 BC) forest began to diminish, and this process has continued until present, with extremely high rates of decline in the nineteenth and twentieth centuries.133 Prior to 1700, there was little cultivation in the country, but this started to change during the eighteenth century when early agriculture expanded. From early to mid-1800s, peasants settled and a basic feudal structure emerged.134 The decrease in forest area is mainly caused by population growth and the following need to clear forests for more farmland to boost cereal production. Water-powered sawmills were used by the communities from the seventeenth century onwards and later on they were being joined by steam-powered installations for sawn timber at the expense of the Romanian forests.135

Mid nineteenth century, about two million hectares of land was used for farming, growing to six million hectares in 1916. By 1938, this had grown to 9.4 million hectares.136 Between 1829 and 1922, approximately three millions hectares of forest were cut down and cultivated for agricultural use, reducing the forested areas with thirty per cent. Another 1.3 million hectares were cut down between 1922 and 1945.137 The deforestation was mainly centered along rivers, resulting in fundamental changes in the landscape and land structure.138

130 Sasaki, 2007, p.113.
Around 1900 – 1940, agriculture mainly consisted of grain farming, which occupied about ninety per cent of the total arable land.\textsuperscript{139} South-Eastern Romania’s plain geomorphology and fertile soils made the landscape extremely suitable for agriculture. Cereals in general (e.g. rye, maize, wheat and sorghum) dominated the landscape for the most part in Romanian agricultural history, caused by the highly profitable cereal exports.\textsuperscript{140} Besides that, fruit trees (plums, cherries and walnuts) and vegetables (carrots, onions, potatoes, etc.) were held in more close surroundings of the settlements.\textsuperscript{141}

In general, villages were located in areas that were protected from strong winds coming from the Carpathian mountains, and near water sources. Settlements were characterized by the presence of houses built close to each other, with small courtyards and small agricultural areas around the house. The larger agricultural lands were located outside the settlements area.\textsuperscript{142} Pre-communists villages were small and homogeneous of culture and occupation. Also, there were many vegetable gardens and vineyards surrounding the farmhouses and villages.\textsuperscript{143} The density of rural settlements was relatively high in the plains and hills, already around 1900 (Figure 2-5; Figure 2-10). The two most common village types in South-Eastern Romania are the linear villages, settled along the roadsides, and centered villages with a clear village heart. The shape of the village centers was influenced by geomorphology, hydrological resources, soil, type of land ownership and infrastructure.\textsuperscript{144} Until the first agrarian reform in 1921 South-Eastern Romania was dominated by large estates. The agrarian reform split the land into small parcels and distributed these amongst the peasants. Initially the peasants received two parcels of 2.5 ha.\textsuperscript{145}

From 1854 the first railway on current Romanian territory came into use. By then, this region did not yet belong to the Kingdom of Romania but to the Austro-Hungarian Empire. In 1869, the Kingdom followed with a railway from Bucharest to Giurgiu, and since then, the network expanded fast.\textsuperscript{146} Besides a railway network, the main infrastructure consisted of small non-paved roads mainly used for agriculture and connecting the small villages. Between the two World Wars, the inhabitants had the obligation to contribute to road maintenance. During the communist period the local authorities were in charge of maintaining local roads in relatively good conditions. After the revolution, maintenance of local roads still falls under the local authorities’ duties, but only in the limits of the funds distributed by the County Council.\textsuperscript{147}

2.3. Cultural landscapes in Rătești around 1900

Rătești municipality is a local administrative unit in Argeș County. The area is representative for the southern part of Romania. Rătești municipality is a rural area; the principal occupation of the people is agriculture.\textsuperscript{148} Rătești is located in Romania’s southern plain (green on Figure 2-1). It’s fertile soils consist of brown forest soils and chernozem on loess deposits and alluvial soils in the floodplain next to the rivers (Figure 2-2).\textsuperscript{149} In proximity of the rivers Argeș and Neajlov the soil is sandy, and has a high fertility as the flooding has deposited fertile soil. Here, clay illuviation soil horizon (luvisol) developed. Also, clay illuviation took place in the loess soils. Fertile brown forest soils and chernozem soils formed in loess deposits in the higher areas of the municipality, and alluvial soils formed in the floodplain directly next to the rivers (Figure 2-2). Both caused highly organic soils, related to steppe and forest-steppe landscapes.

\textsuperscript{139} Fraser & Stringer, 2009, p.48.
\textsuperscript{140} Fraser & Stringer, 2009, p.48.
\textsuperscript{141} Fraser & Stringer, 2009, p.48.
\textsuperscript{142} Calinescu, personal communication, May 12, 2014.
\textsuperscript{143} Dawson, 1987, p.248
\textsuperscript{144} Calinescu, personal communication, May 12, 2014.
\textsuperscript{145} Micu, personal communication, June 4, 2014
\textsuperscript{147} Calinescu, personal communication, May 12, 2014.
\textsuperscript{148} Kristensen, 2011, pp.31-35.
\textsuperscript{149} Iojă, personal communication, April 25, 2014.
The geomorphology is characterized by gradual river terraces, and a wide floodplain in close proximity of the rivers Argeş and Neajlov. Răteşti is located between plain (green on Figure 2-1) and hill areas (yellow on Figure 2-1), causing gradual variations in elevation. The maximum altitude is around 250 meter above sea level. Răteşti village is located at 210 meter above sea-level, and the adjacent plain towards the river is located at 199 meter above sea level (Figure 2-3). The rivers provide a hydrologic system that creates a well-developed floodplain, while on the higher plateaus water is relatively scarce. However, the area is generally rich in groundwater.\footnote{Iojă, personal communication, April 25, 2014.}

The climate is continental, with an average annual temperature of 10.5 degrees Celsius with warm and hot summers and cold winters. The precipitation averages around 600 - 700 mm/year. This climate has its influence on the landscape due to the (snow)blizzards and drought periods. The original landscape of sylvo-steppe vegetation consisted of grassland with patches of forest and shrubs. The periodically flooded plain was originally covered with forest and meadows, alternated with marshes.\footnote{Sasaki, 2007, pp.113-124.}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2-1.png}
\caption{General geomorphological situation the South-Eastern Romanian plane, with the location of Răteşti highlighted. Source: Iojă, 2014.}
\end{figure}
Traditional cultural landscapes in South-Eastern Romania around 1900

Figure 2-2 Soil map of Rătești with the different soil categories present in the municipality. The categories are translated from English. The original category-names can be found in Appendix II. Source: University of Bucharest, 2014.

Figure 2-3 Digital Elevation Model (DEM) for Rătești with own highlights. The west-south orientation of the rivers towards the Danube river is clearly visible in the elevations of the landscape, which range from 250 until 190 meter above sea-level. Source: University of Bucharest, 2014a.
Around 1900, agriculture in Răteşti was occupied with extensive livestock husbandry, especially sheep, using the natural and semi-natural sylvo-steppe grasslands and floodplains next to the Argeş and Neajlov rivers as grazing land (Figure 2-4). However, already around that time, land was cultivated for grain crops (maize, wheat, oats, barley) in open field systems and cultivated land had become dominant in the landscape (Figure 2-5). Due to the high fertility of the soil, large areas of the municipality were early cultivated, and agriculture expanded fast. Especially along the Argeş river, patches of forest were located. To a lesser extent, this was also the case for the Neajlov river. Both rivers also played a role in protecting farmland from flooding, as seen in Valea Dragului case, also located next to the Argeş river.

The settlements were typical street villages, developed at convenient locations along main roads in the municipality, and created on natural elevations in the landscape. The first villages emerged on the most northern ridge of the village, close to the Argeş river (Figure 2-3). A second ‘row’ of villages was created parallel to the Neajlov river, also on small elevations in the landscape, although less visible on the Digital Elevation Model (Figure 2-3; Figure 2-5). The settlement structure that was already present around 1900, is still present today. The main roads were dirt roads, commonly used for local (agricultural) transport. Gardens surrounded the villages, while agricultural fields appeared in the lower lands of the municipality, as can be seen from a comparable case study of a rural South-Eastern Romanian village around 1900. In this study, Sasaki identified a “dense network of narrow, sinuous paths connecting the villages and the frequency of wells as indicators of livestock herding as the main local activity.” The water system was focused on the Argeş and Neajlov rivers that have a west-east orientation towards the Danube river.

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154 Sasaki, 2007, p.120.
155 Calinescu, personal communication, May 12, 2014.
156 Calinescu, personal communication, May 12, 2014.
2.4. Cultural landscapes in Stăncuţa around 1900

Stăncuţa municipality is a local administrative unit in Brăila County, Romania. It is situated along the Danube river stretch in Eastern Romania, about 150 kilometers before the Danube river delta, in a former flooding area.\textsuperscript{159} The area is representative for rural lowland areas such as former floodplains. Stăncuţa is located in a border area covering subsidence plains and higher plains (Figure 2-6) with a range in elevation from five meters below sea-level to thirty meters above sea-level (Figure 2-8). This makes the soil fertile, with mostly chernozem soils ("black earth"), consisting of dark soil, rich in organic material/humus, emerging from loess in an originally steppe-region (Figure 2-7).\textsuperscript{160} It produces a high agricultural yield. The most important river is the Danube river. The soils in Stăncuţa are also saline, like in most parts of former flooding areas with a warm climate. This is one of the reasons for the current rice cultivation, as during the growth of rice, when the fields are immersed with water, the salt dissolves and is washed away.\textsuperscript{161} The geomorphology of Stăncuţa is expressed in large flat surfaces, separated by a network of rivers. The areas in proximity of the Danube river are more sandy, and have lower fertility than the areas further away from the Danube.

The climate consists of (very) hot summers, and (very) cold winters. The area is not protected from the Siberian wind by any hills, therefore the climatic influence from Siberia is higher than in for example Râmeşti, which is protected by the Carpathians. This has a dry climate as result, with a maximum of 500 mm precipitation per year, including extreme drought in summer (Photos showing the drought in Stăncuţa in August 2013: Figure 4-51; Figure 4-52).

\textsuperscript{159} Kristensen, 2011, pp.31-35.
\textsuperscript{160} Iojă, personal communication, April 25, 2014.
\textsuperscript{161} Cosor, personal communication, May 4, 2014.
Figure 2-6 General geomorphological situation the South-Eastern Romanian plane, with the location of Stâncuța highlighted. Source: Iojă, 2014.
Soil map Stâncuța

- Cernozemuri gembice și cernozemuri argiloiluviale (în crovuri și padini)
- Cernozemuri gembice tipice, pe nisipuri (relief valurii eolian
- Cernozemuri carbonatice, freatic-umedo
- Cernozemuri geizate, pe depozite fluvio-lacustre recente
- Cernozemuri salinizate, pe depozite fluviale și fluvio-lacustre recente
- Cernozemuri semi-carbonatice, freatic-umedo
- Cernozemuri tipice, semi-carbonatice, pe depozite fluviale și fluvio-lacustre recente
- Cernozemuri vernice, carbonatice
- Cernozemuri vernice, semi-carbonatice
- Lacovisti pe depozite fluvio-lacustre recente
- Lacovisti saraturate, pe depozite fluvio-lacustre recente
- Lacovisti, cu gleizare relictă (drenate), pe depozite fluvio-lacustre recente
- Lacuri și băi
- Miastini
- Protosoluri aluviale
- Protosoluri aluviale gleizate
- Protosoluri aluviale salinizate
- Bolonreturi tipice ai solonreturii lunișe
- Soluri aluviale (inclusiv protosoluri aluviale)
- Soluri aluviale (inclusiv protosoluri aluviale) trecent gleizate
- Soluri aluviale salinizate
- Soluri gleice, cu gleizate relictă (drenate) pe depozite fluvio-lacustre recente
- Soluri gleice, pe depozite fluvio-lacustre recente

Figure 2-7 Soil map of Stâncuța with the different soil categories present in the municipality. Translation of the soil categories to English can be found in Appendix II. Source: University of Bucharest, 2014.
In contrast to Rătești municipality, large parts of Stâncuța municipality were not yet dominated by agriculture around 1900. The map therefore captures the landscape as it was before the large (rice) cultivations during communism (see Chapter 3). Although large parts of the municipality were not yet cultivated, the villages that are present nowadays were already present in the 1900 landscape. The villages were dense centered villages with well-defined hearts and a clear distance between neighboring villages. The centered character of the villages protected the houses from the cold northern wind. In particular areas, mostly on the flood plains in the North-East, there existed the seasonal settlements of the shepherds, known under the name ‘stână’. Close to the villages

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162 Carlinescu, personal communication, May 14, 2014.
163 Micu, personal communication, June 4, 2014.
The communal pasture was located, used for the animals inside the households.\textsuperscript{164} The villages Stâncuţa and Stanca were not yet protected from the Danube by the large dyke, and therefore had a high risk of flooding. Besides agriculture and animal husbandry, fishery was very important to these villages, hence the close location to the Danube river (Figure 2-10). The landscape around 1900 had an open character.

Originally, as seen from the 1900-1920 maps, Stâncuţa municipality was for a large part covered with marshes and meadows, alternated with big lakes (Figure 2-10). This rough and uncultivated area was located north of the line Stâncuţa (east) to Cuza-Vodă (west). Surrounding Stâncuţa and Stanca, mainly pastures and cultivated grounds could be found. South of the village Cuza-Vodă in the west, also some marshes and flood plains are found, from the smaller river there. Already around 1900, plans were made to cultivate and drain the area for agriculture. Nowadays, Stâncuţa municipality still consists for 35\% of a heterogeneous wetland system that contains numerous shallow lakes, marshes and channels. This area is covered by alluvial forests and natural grasslands within the Danube river and lake areas (Figure 2-9).\textsuperscript{165}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2-9}
\caption{Photo taken on the Small Island of Braila, giving an impression of the original uncultivated landscape of around 1900: A flooding area with marshes and swamps. Dry in summer – a lake during winter. Stâncuţa, August 2013.}
\end{figure}

\textsuperscript{164} Micu, personal communication, June 4, 2014.
\textsuperscript{165} Kristensen, 2011, pp.31-35.
2.5. Conclusion

Table 2.1 summarizes the landscape character of Râtești and Stâncuța around 1900. Both municipalities are located in the fertile South-Eastern Romanian plain and were already around 1900
largely dominated by agriculture. However, large parts of Stăncuţa were not yet cultivated around that time, and still belonged to the flooding area of the Danube river, characterized by marshes and lakes. Before 1921 the municipalities were dominated by large estates, but the agrarian reform law divided the land into small parcels of approximately 2.5 hectares and distributed them amongst the peasants. The animals were held in close proximity of the villages on common grounds. In both areas, the land can be characterized as very open.

<table>
<thead>
<tr>
<th>Case study</th>
<th>Răteşti</th>
<th>Stăncuţa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical geography</td>
<td>Climate: continental, precipitation 600-700mm/y; Soil: luvisol, chernozem and brown forest soils; Original vegetation: forest; Area municipality: 79km²; Geomorphology: Hills and lowlands.</td>
<td>Climate: dryer, continental precipitation 500mm/y; Soil: chernozem. More fertile soils than in Răteşti; Original vegetation: forest-steppe; Area municipality: 255km²; Geomorphology: (Flood)plain.</td>
</tr>
<tr>
<td>Land use</td>
<td>Mostly agriculture (mainly grain) and pasture (animal husbandry). Some wastelands.</td>
<td>Mix of agriculture (mainly grain), pastures (animal husbandry) around the villages and flooding areas next to the Danube river.</td>
</tr>
<tr>
<td>Parcellation pattern</td>
<td>Open fields and common grounds.</td>
<td>Open fields and common grounds.</td>
</tr>
<tr>
<td>Field boundaries</td>
<td>Mostly non-existent.</td>
<td>Mostly non-existent.</td>
</tr>
<tr>
<td>Settlement structure</td>
<td>Linear villages.</td>
<td>Centred villages.</td>
</tr>
<tr>
<td>Land Ownership</td>
<td>Feudal system. Large estates before 1921 agrarian reform split the land and distributed it amongst the peasants.</td>
<td>Feudal system. Large estates before 1921 agrarian reform split the land and distributed it amongst the peasants.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Non-paved small roads for agricultural use.</td>
<td>Non-paved small roads for agricultural use.</td>
</tr>
<tr>
<td>Water system</td>
<td>Argeş and Neajlov rivers.</td>
<td>Danube river.</td>
</tr>
</tbody>
</table>

Table 2.1 Summary of the traditional landscape character in Răteşti and Stăncuţa based on eight landscape indicators, around 1900.
3. Cultural landscape changes in South-Eastern Romania in the communist period (1947 -1989)

3.1. Introduction

With the described 1900 cultural landscapes in mind, the next episode in Romanian history is the communist period, which runs from 1947 – 1989. The socialist restructuring of landownership patterns and farming systems caused traditional rural landscapes to be replaced by ‘productivist’ agrarian landscapes.\textsuperscript{166} These shift in political and socioeconomic structures had strong effects on the landscape. As landscape (changes) cannot be understood without its historical context, this chapter first analyses the communist landscapes and landscape changes, before chapter four focusses in depth on the post-communist landscape changes.

3.2. General cultural landscape changes in rural (South-Eastern) Romania in the communist period (1947-1989)

Around 1950 the conversion of forest area into agricultural land intensified, as a consequence of large scale reclamations for agriculture. Between 1922 and 1945, 1.3 million hectares of forest was already cut down, after already large declines in forest area before 1922, as seen in chapter two.\textsuperscript{167} The process intensified from the 1950s onwards as a consequence of large scale reclamations for agriculture. Also, the war compensation Romania had to pay to the Soviet Union after the Second World War was mostly paid in fuel wood to the Soviet heavy industry. Therefore in 1948, Romania had only 28% of its territory forested.\textsuperscript{168}

With the introduction of a centrally planned communist regime in years 1947, the intensification of agriculture also led to the replacement of the fine-grained land-use mosaic with homogeneous landscapes as small fields merged. As small fields were joined, linear elements were reduced and boundary vegetation removed.\textsuperscript{169} The most radical changes were found in the landscape structure, which coincided with the homogenization of agriculture.\textsuperscript{170} These changes emerged mainly in the period between 1953 – 1969 due to the beginning of collectivization and the increasing intensification of agriculture that was aimed at high production.\textsuperscript{171} However, despite the drastic decline in landscape complexity and spatial heterogeneity, the land use remained fairly stable.\textsuperscript{172}

Agriculture kept on dominating the South-Eastern Romanian landscape. The main objective of socialist agricultural systems was to achieve production targets. Input and output prices were centrally controlled to have maximum control over production, land was confiscated from the people and reorganized into mainly state and collective farms, which regulated all agriculture.\textsuperscript{173} However, Baessler and Klotz found that the total area of agriculture did not increase as radically as would be assumed, but the drastic changes are more in the intensification and scaling of the landscape, upcoming mechanization and the nationalization of land.\textsuperscript{174}

\textsuperscript{166} Sasaki, 2007, p.113.
\textsuperscript{167} Vasile & Mantescu, 2009, p.97.
\textsuperscript{168} Vasile & Mantescu, 2009, p.97.
\textsuperscript{169} Baessler & Klotz, 2006, p.48.
\textsuperscript{170} Baessler & Klotz, 2006, p.48.
\textsuperscript{171} Baessler & Klotz, 2006, p.48.
\textsuperscript{172} Baessler & Klotz, 2006, p.48.
\textsuperscript{173} Fraser & Stringer, 2009, p.49.
\textsuperscript{174} Baessler & Klotz, 2006, p.48.
The push to a centrally planned production system led to changes in the parcellation pattern over the course of communism (1947 – 1989), but with a strong increase after the implementation of the first Agrarian Reform Law in 1945, and another strong increase after the 1949 Land Law. The first law collectivized holdings first larger than 50 ha, and the second one holdings around 50 ha. More details on the collectivization process can be found in Chapter five. The laws resulted in up scaling of the parcels, sometimes through land consolidation, and extending and intensifying agriculture leading to an open scale landscape with big parcels. Land improvement and large scale production caused a reorganization of field systems, creating mono-functional landscapes. These landscapes were characterized by large fields where few old landscape structures and landscape elements remained, such as boundary vegetation.\textsuperscript{175} Blacksell explains: \textit{“In particular field boundaries, drainage systems, local track networks, mixed farming systems, including small-scale forestry, and a multitude of traditional farm buildings disappeared form the landscape.”}\textsuperscript{176} However, there were striking differences between lowland plains and mountainous areas for instance. The plains of Southern Romania were marked by state-run and collective farming. Enormous patches of arable land dominated the landscape, whereas in the mountain areas, also private small scale land parcels remained.\textsuperscript{177}

The communistic innovation resulted in a landscape with new infrastructure. New irrigation channels and drainage systems were introduced in the landscape, and upgrading of the system caused the water systems to become more regulated. Around eighty per cent of the Romanian agricultural land was irrigated during communism.\textsuperscript{178} The centrally planned organization of the infrastructure and water systems maintained the system in almost the whole country.\textsuperscript{179} The whole system and infrastructure was improved for the benefit of the ‘productivist’ character of the land.\textsuperscript{180} For example, between 1967 and 1972 the first Romanian highway was created between Bucharest and Pitesti.

Settlement pattern and settlement systems are another aspect of the landscape that changed heavily under communism. Settlements are seen as one of the key-aspects of a cultural landscape, representing many social, cultural and spatial aspects of landscape.\textsuperscript{181} First of all, the modernization of villages was discussed by the national government, resulting in the designation of around 5,000 small rural settlements, identified as ‘irrational’.\textsuperscript{182} It meant that the villages were too small for cost-effective servicing, too remote for daily commuting or not in use anymore as a result of the formation of large cooperative farms.\textsuperscript{183} As a consequence, some settlements disappeared from the landscape. Secondly, not only village numbers, but also village structures changed. Centralized planning created new blocks of flats in village centers for cooperative workers, which also led to the abandonment of houses elsewhere. More on this phenomenon is discussed through the case study Stâncuța (Paragraph 3.4).

Thirdly, there has been a shift in settlement structure by the upgrading of villages to a town status. This upgrading concerned 300-400 villages and aimed to fill the empty rural areas, to provide a range of services and employment for every group of communes. In 1945 there were only 153 towns in Romania, and between 1950 and 1952 eight of them lost their town status. Therefore, the need for this development was high, so the communist party argued. By 1968, thirty-eight settlements were promoted to town status, and fifty-three more towns were created in that year.\textsuperscript{184} A quarter of all rural dwellers moved to the towns and only the selected villages grew into small cities, resulting in an out-migration and continuing depopulation of the rural areas.\textsuperscript{185} The changes in landscape were immense, as the built up area increased in some areas, and decreased in others. The depopulation of the villages led to a degradation and disappearing of individual farmsteads.

\textsuperscript{175} Kristensen et al., 2013, p.8.
\textsuperscript{176} Blacksell, 2010, p.21.
\textsuperscript{177} Emanuelssson, 2009, p.325.
\textsuperscript{178} Rugg, 1985, p.112.
\textsuperscript{179} Rugg, 1985, p.280.
\textsuperscript{180} Carlinescu, personal communication. May 14, 2014.
\textsuperscript{181} Bell et al., 2009, p.444.
\textsuperscript{182} Dawson et al., 1987, p.249.
\textsuperscript{183} Dawson et al., 1987, p.249.
\textsuperscript{184} Dawson et al., 1987, p.249.
\textsuperscript{185} Ioan, 1996, p.176.
Farmers were alienated from their farm land during communism. Through expropriation, a lot of local and regional elite – big land owners – fled the country, leaving their farms behind. This has also been identified in for example Răteşti, where old elite buildings were left to decay (Figure 3-1). \(^\text{186}\) This resulted in the decay of old feudalistic structures such as manor houses and of old and abandoned agricultural structures, in close proximity of the villages. They are relics of the old landscape. Collective and state farms mostly arose at the borders of the villages, constructing new agricultural buildings and new houses which also affected the landscape. \(^\text{187}\) Rugg: “The modernization of housing constitutes a striking change in the village landscape […]. Villages exhibited a mixture of old and new; houses that look little different from what they did in the nineteenth century, possibly with a few repairs or extensions, represent the old; the impact of industrialization in fostering houses or apartment buildings represent the new.” \(^\text{188}\) It has to be emphasized that under the communist ideology, each building must serve a functional purpose. \(^\text{189}\)

![Figure 3-1 Former landowners' house in Răteşti left to decay when the land was collectivized during communism. Răteşti, August 2013.](image)

\(^{186}\) Born, personal communication, March 28, 2014.

\(^{187}\) Rugg, 1985, p.284.

\(^{188}\) Rugg, 1985, p.290.

\(^{189}\) Rugg, 1985, p.288.
3.3. Cultural landscape changes in Rătești in the communist period (1947-1989)

Due to the rapid intensification of agriculture and due to large reclamations of land, already before communism but also during communism, forest area declined. Especially next to the rivers, such as the Argeș and Neajlov this has been identified, although still a belt of forest area next to the river remained. There are also forests south of Rătești village, and in the South-Western part of the municipality, as well as surrounding Nejlovelu and Mavrodolu villages. Comparing the 1980 and 1910 maps, it appears that the forests surrounding the villages emerged during communism, which can be explained by the emergence of production forests during communism. Through the nationalization of agriculture, the sector expanded and large companies took over the fields, increasing grain export rapidly, and turning the landscape into a more productive landscape. Corn and sunflower were most produced in Rătești. The type of land use did not change that much during communism, but mostly the land use intensity and structure changed. Agriculture continued to be the main land use during communism.

During communism, small scale fields were replaced by large plots. The plots in the villages for private use of cooperative farm members were reduced in size from 0.30 hectares in 1962-1969 to 0.15 in 1969-1978, and were restricted to the ground surrounding the house. Most radical changes in the field pattern were in the run up just before communism: 1953 – 1969, small scale landscape elements such as ditches, fences, and boundary vegetation disappeared and scaling took place due to the increase in productivity and emergence of large scale collective and state farms.

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190 Fraser & Stringer, 2009, p.48.
Large scale mono-functional homogeneous plots emerged, and the field boundaries consisted mainly of roads and irrigation channels. The parcels were rectangular, but differed in orientation (e.g. north of Rătești north-south direction; south of Rătești east-west direction; Figure 3-2; detail in Figure 3-3). The large square parcels were subdivided with roads in rectangular fields.

The infrastructure also changed, but not to a large extent. Some roads were updated, electricity was installed and some smaller roads disappeared from the landscape. The national government was responsible for this. However, the infrastructure was still poor in the region, and postponed development.\(^{193}\) The water system in Rătești was partly focused on the drainage of the area, due to the location on the subsidence plain, and the high levels of groundwater. In the higher parts, extensive irrigation systems were required. The water system was also centrally organized, which benefited of the utility and maintenance of the irrigation system. During communism, the biggest road in the municipality and the first highway in Romania, the A1 highway from Bucharest to Pitești, was constructed (1967-1972), dividing the area in two (Figure 3-2).\(^{194}\)

Rătești municipality is located in the vicinity of Pitești, a large industrial city. However Rătești did not develop towards industrial or residential use.\(^{195}\) The villages remained largely agricultural during communism, and were mainly linear villages, following the roads in the landscape (figure 2.2). Two of the villages were of the more centered type: Nejlovelu and Mavrodolu. These villages were also surrounded with forest area in the communist times.

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\(^{193}\) Kristensen, 2011, pp.31-35.

\(^{194}\) Carlinescu, personal communication, May 14, 2014.

\(^{195}\) Kristensen, 2011, pp.31-35.
3.4. Cultural landscape changes in Stâncuţa in the communist period (1947 – 1989)

Compared to the state of the landscape around 1900, a clear and large scale decline of natural areas is observed (Figure 3-4). Largest decline was around 1960, when large rice plantations of approximately 7000 hectares emerged in the landscape of Stâncuţa, draining and cultivating the original floodplain and wetlands North-East in Stâncuţa municipality.\footnote{Kristensen, 2011, pp.31-35.} Grand production plans such as the rice plantations continued during communism. The large rice plantations had a destructive impact on the landscape of Stâncuţa, as new landscape layers covered the original ones. The small island of Brăila (210 km$^2$) is one of the only remnants of the extensive wetlands which used to be part of Stâncuţa municipality before the structural configurations of the Inner Danube Delta in 1970.\footnote{Kristensen, 2011, pp.31-35.} Besides rice cultivation, also other agriculture intensified. Main crops in the area were cereal crops such as rye and wheat. In close proximity to the village, small parcels with vegetables and fruit trees were located.
The intensification of agriculture caused the scaling in landscape and parcellation pattern. Small scale fields were replaced by large scale parcels, and landscape elements such as fences, tree lines and field boundaries disappeared. The plots available in the villages for private use of cooperative farm members were restricted to the ground surrounding the house and were reduced in size from 0.30 hectares in 1962-1969 to 0.15 in 1969-1978. Most radical changes in the field pattern were in the run up just before communism: 1953 – 1969, with for example in 1960 the emergence of the largest rice plantation. The parcellation pattern follows the division in land use and land cover. In the eastern part of the municipality, the large rice cultivations make the parcellation rectangular, small, and with a high amount of small channels dividing the parcels for irrigation of the rice fields (Figure 3-4). The eastern part of the municipality is less physically divided by channels, and therefore has a different pattern than the eastern part. Here, the patches are divided into larger, more square patches, and narrow, small scale patches in closer proximity of Cuza-Voda village. This can be explained by the geomorphology of the western part of the municipality: small elevations in the landscape, and generally higher elevation than in the eastern part of the municipality. Through the scaling of agricultural land, some field boundaries were no longer needed and disappeared. For example boundary vegetation, fences, and small ditches had to make place for large scale cultivations. Larger field boundaries such as irrigation channels and roads appeared in the landscape (Figure 3-4).

The infrastructure was upgraded during communism. Electricity connections were installed, bringing electricity to all the villages in the area. Some smaller roads disappeared due to the scaling of the landscape, and some bigger roads were updated for the benefit of the intensified agriculture. Irrigation schemes were implemented using the water of the Danube and the inland rivers (also some groundwater sources) to supply the municipality of Stâncuța. Especially since the 1950s, when modernization influenced the water systems rapidly, as the idea was that Romania should be a strong and viable economy. This had an intensification of the agricultural lands as a result, including the cultivation of wetlands close to the Danube, and drainage systems to support this. In 1950, the wetland west of the Danube has been drained, and converted into agricultural land (comparing Figure 2-10 and Figure 3-4). To support this, a dyke was built along the Danube river. Also the irrigation systems were technologically updated and arranged from 1950 onwards. The grand production plans and accompanying irrigation and drainage systems had a destructive impact on the landscapes, not only visually, as old structures were overlaid by new structures, but also landscape ecologically, as ecosystems and nature values were destroyed.

Settlements originally settled in the plain because of the available water resources, and the protection from the cold winter wind with North-East direction (known as: “Crivatul”). The general background showed that many changes took place in settlement structure during communism, however, changes seem to be small when comparing the 1910 map with the 1980 map. The most changes took place within the villages, as dwellings were rationalized and centralized into blocks of flats in new village centers, as happened for example in Stâncuța village (Figure 3-5). House-blocks were created in the village centers, but houses were abandoned elsewhere. The loss in houses also emerged as a result of damage, deportation of the population, relocation to state farms and large-scale land amelioration programs. The land became property of the state during communism, and therefore former land owners were disowned from their land. Sometimes voluntarily (e.g. by churches or other companies) and sometimes by force. Former land owners therefore became land users.

198 Ioan, 1996, p.176.
200 Cosor, personal communication, October 25, 2013.
201 Kristensen, 2011, p.15.
202 Iojă, personal communication, April 25, 2014.
203 Bell et al., 2009, p.444.
204 Bell et al., 2009, p.444.
3.5. Conclusion

The most visible landmarks of communism include first of all, extensive fields created during the collectivization of agriculture, second of all, large housing developments on the outskirts of larger cities and blocks of houses within the villages, third of all the decay of buildings, as a result of outmigration of the people from the villages to the cities and state farms, fourth of all, land use intensified during the communist era. All these trends led to the disappearance of small scale landscape elements such as tree lines, field boundaries, and small roads and ditches. The developments in Rătești and Stâncuța have been very similar, with exception of the large scale drainage of wetland area in Stâncuța for the purpose of rice cultivation.

205 Berentsen, 1992, pp.137.
206 Kuemmerle et al., 2006, p.450.
4. Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

4.1. Introduction

Landscapes are dynamic phenomena, as has become clear from chapter two and three. Constant changes, influenced by several socioeconomic and political changes that are further discussed in chapter five, have formed the landscapes as they are today. The next step in landscape changes represents the focus of this thesis, the post-communist era (1989 – present). In Romanian history, two major political shifts have influenced the landscape. One is the socialist restructuring of landownership patterns and farming systems during communism (1947-1989), discussed in chapter three, and the second one is the political and socioeconomic shifts and land reforms that were put in motion after the fall of communism in 1989, discussed in this chapter and chapter five. Landscape changes during this last period are assumed to have influenced the present cultural landscape to a large extent. The research used both map-based and visual-description-based approaches to analyze the landscapes under investigation. This includes fieldwork and map analysis, supplemented by literature and data from interviews. The landscape changes are described following the seven selected landscape indicators: land use, parcellation pattern, field boundaries, infrastructure, water system, land ownership and settlement structure.

4.2. General landscape changes in rural (South-Eastern) Romania in the post-communist period (1989-present)

Land use

The most important post-communist land use changes were large-scale cropland and pasture abandonment in some areas. Fields were abandoned and regrowth caused an increase in forest areas. Between 1989 and 2006, cultivated area decreased from 9.6 million hectares in 1989 to 7.8 million hectares in 2006 (Figure 4-1). The main reason for this were “people’s uncertainty with regard to landed property, the precarious financial condition of the new owners, the inadequate farm structure, the high proportion of elderly people among the group of individual farm owners, the lack of materials and money to work the land, insecurity in selling the surplus of products at prices allowing resumption of the process of product in, and last but not least, the lack of prospects in the conditions of an adverse economic milieu.” Also, the state did not support the farmers enough, although this changed with the accession to the European Union in 2007, and the availability of EU funds after that time.

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208 Kristensen et al., 2013, p. 8.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

In contrast to the land abandonment, in areas where farmers were able to take over assets from former collective farms, large scale production with even more intensive use of modern technology, was established. Agriculture remained the most dominant land use. In several areas, foreign investors brought capital and equipment to modernize and expand previous agricultural production. However, land use change has been observed more in the structure (parcel size), than in the land use categories (agriculture/pasture/forest). Vineyards and orchards reported significant decreases after 1989, as they were replaced mostly by grassland and pastures (Figure 4-2).

The Romanian forests also undergone severe changes after the fall of communism. The people returned to the countryside after the property restitution, resulting in an increased demand for fuel wood for heating, construction and cooking, thus deforestation of large areas. The forest surface is officially declared to be 26% of the national territory, but in fact a big part of the forest surface was not replanted after the fall of communism. Technical innovations such as the chain saw and the tractor also affected the destiny of the Romanian forests for the worse and intensified the production of the forests.

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211 Kristensen et al., 2013, p.8.
212 Iojă, personal communication, April 25, 2014.
213 Fraser & Stringer, 2009, p.50.


**Parcellation pattern and field boundaries**

Despite a mono-functional (homogeneous) large-scale landscape would be expected after the communistic period, small scale-plots and land(scape) fragmentation are still most common in South-Eastern Romania. This means a transition took place after the fall of communism, reversing the scaling of the landscape caused by communism: “Before 1989, Romania was one of the countries with the largest physical size of agricultural holdings in Eastern Europe; after 1989, it became one of the countries with the smallest physical size of agricultural holdings.”

The trend that has been identified is a shift in the first years after communism from large scale fields to small scale fields, due to the privatization of former collectivized land and restitution of the land to the former owners (see part II of the thesis). A small scale landscape pattern emerged. Around the turn of the millennium from this newly formed pattern and restitution onwards, this trend started to shift a bit, as people decided to aggregate and consolidate the land by establishing associations, up scaling the land to larger fields. Therefore in the current Southeastern Romanian landscape, a mixture of small and large scale fields exist together.

The land fragmentation is reflected in the landscape by the parcellation pattern, showing small patches of fields and irregular parceling. On average, the Romanian inhabitant owns around one hectare, from which 0.67 ha is agricultural land (0.44 ha is arable land), and 0.26 ha is forest area. Average property is split into ten to twenty parcels, which can be located in different parts of the village, showing the high land fragmentation. Many small-scale farmers only produce for their own consumption and their products do not find their way to the markets. This is also reflected in the landscape where small plots with private crops surround the villages.

However, the landscape may look more homogeneous than this statistics assume, as the land owners are not always also the land users. Several land owners can rent out their land to one farmer, who consolidate the different small patches to one. Although land fragmentation has a negative influence on agricultural productivity, landscape diversity does benefit from it. This landscape diversity is reflected in a high number of paths, drainage ditches, linear shrubs and tree lines. Unfortunately, most of these systems have been destroyed or are in a severe state of decay. By 2006, only 3.14% of the overall managed agricultural area was irrigated, out of 3 million hectares that were provided with irrigation systems. The degradation of the systems negatively affected soil quality and agricultural productivity.

**Infrastructure and water system**

During communism, the infrastructure and water systems were nationally organized, and the maintenance was relatively good. Around eighty per cent of the Romanian agricultural land was irrigated, but in post-communist times, this dramatically decayed towards around twenty per cent. In 1989, the irrigated area was 3.067 thousand hectares, the drained area was 3.082 thousand hectares and the damned area 216 thousand hectares. Unfortunately, most of these systems have been destroyed or are in a severe state of decay. By 2006, only 3.14% of the overall managed agricultural area was irrigated, out of 3 million hectares that were provided with irrigation systems. The degradation of the systems negatively affected soil quality and agricultural productivity.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

overgrown with shrubs. The indirect effects in the landscape are for example a decline in agricultural yields, degradation of land, decay of irrigation- and drainage systems, and marginalization of land.227

Settlement structure and land ownership

In post-communist Romania, not much has changed in settlement structure. The houses that became abandoned due to collectivization stayed abandoned, and added to this, the former state- and collective farms became abandoned and decayed as well, which left their mark on the landscape. Due to population growth, the villages and cities in Romania also grew, resulting in an increase in built up area (Figure 4-3). The overall agricultural area dropped by 38.0 thousand hectares between 1990 and 2006 in favor of built up area which grew with 41.7 thousand hectares, particularly in the vicinity of large urban centers.228 Additional income opportunities in the cities caused massive outmigration from the rural areas and abandonment of farmsteads.229 On the verges of villages and cities, big houses were built to show the newly gained wealth of the people gained in Western Europe. Money made in Western Europe has been invested in real estate, creating large villas (sometimes unfinished) at the edges of cities and villages.230 Iojă: “The houses are to show that they are rich, and made a lot of money. However, the big houses do not have water supply nor sewage. It is only about the image. The people that made a lot of money in other European countries wanted to invest this in their own country through real estate.”231

Figure 4-3 The evolution of built up area in hectares from 2000 until 2006. Source: Balteanu & Popovici, 2010, p.99.

Starting the fall of communism, land ownership was restituted to the pre-communist land owners, and private farming increased extensively. This process was put in motion in the beginning of 1990, by the enactment of Land Lay 18/1991, later modified by Law 169/1997, Law 1/2000 and Law 247/2005, who arranged the decollectivisation process.232 More on this process can be found in part II of this thesis. Below, Figure 4-4 shows the increase in private property in the post-socialist era for Romania, divided in different forms of property and for different land use categories. “Before 1989, the main forms of land exploitation were the collective farms, which owned over 68.8% of the agricultural area, at an average of 2,375 ha and state farms, which held 29.7% of the country’s agricultural land. Private farms amounted to a mere 9.5% agricultural land, and it consisted largely

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227 Fraser & Stringer, 2009, p.50.
228 Balteanu & Popovici, 2010.
230 Iojă, personal communication, April 25, 2014.
231 Iojă, personal communication, April 25, 2014.
of pastures and natural hay-fields situated in the hill and mountain regions." This division of agricultural land changed to a large extent with the restitution of land. By 1997, family farms and household plots consisted of 67% of the utilized agricultural area, with an average size of around three ha. By 2005, when the last restitution Law was adopted, up to 99.5% within the 65% agricultural land was privately owned, with an average of 2.1 ha per farm, and an average of 3.7 parcels per farm. Table 4.1 shows these great differences in communist and post-communist times.

Table 4.1 Comparative number and size of farms for the communist period (state in 1989) and post-communist period (state in 2005) for Romania. Source: Balteanu & Popovici, 2010, p.99.

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Collective farms</td>
<td>State farms</td>
</tr>
<tr>
<td>Number</td>
<td>3,776</td>
<td>411</td>
</tr>
<tr>
<td>Average area (ha)</td>
<td>2.374</td>
<td>5.001</td>
</tr>
</tbody>
</table>

Figure 4.4 Land fund by categories of use and forms of property for Romania in the socialist and post-socialist era in percentage of agricultural land. Source: Balteanu & Popovici, 2010, p.99.

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234 Knight, 2010, p. 4.
4.3. Cultural landscape changes in Rătești in the post-communist period (1989-present)

Figure 4.5 Landscape changes in Rătești. The bright colors represent the changes between 1980 and 2013 per land cover category.

Figure 4.6 The location of change in Rătești between 1980 and 1997, 1997 and 2003 and 2003 and 2013. From this map only the location of changes is shown, not to which land use category the changes belong.
Land use

Some of the national land use changes that emerged since the fall of communism have also been observed in Răteşti, like for example land fragmentation and abandonment of agricultural land following land restitution. However, land abandonment emerged in much higher frequency in the northern region of Romania.235 The southern region, in which Răteşti is located, had better natural conditions, and easier market access, which benefited the development of profitable farming.236 Overall, the changes in land use over the long period of 1989 – present are not that large.

When looking at the long term land use changes since the fall of communism in 1989 until 2003, the VOLANTE project concluded a slight increase in cropland of around 4.3%, and an increase in built up area of around 2.2%. Forest increased by 161 hectares, and built up area with 50 hectares in Răteşti municipality. This increase was on the account of meadows and pastures, which decreased with 7.2%. However, during this long period, a reversed trend has been noticed. Between 1991 and 1994, a conversion from arable land to pasture took place. This resulted in a changing landscape pattern, as also the parcels increased in size. Since 2001, around 600 ha of pasture became in disuse, or was converted to arable land.237 The total amount of land use changes between 1980 and 2003 identified by the VOLANTE project was some 13%. They state that 87% of the land use in the area remained stable.

From the maps and land use statistics used in this study the conclusion of the VOLANTE project has been supported. It became clear that concerning land use, not much has changed. However, the changes observed in the municipality were not linear. For example, agriculture has increased with 0.6% between 1980 and 1997, and from 1997 to 2003 it decreased in hectares (1.4%). For the total area in hectares of pasture, this trend was the other way around. First a decline was observed (decline of 2.5%) and from 2003 onwards, a slight growth has been observed (0.5%). Forest area slightly increased in the post-communist era (1.4%) and also built up area increased (1.5%). Vineyards disappeared from the landscape, and orchards also almost disappeared (11.8 ha left in 2013). Figure 4-7 shows the changes in relative percentages in Răteşti between 1980 and 2013. The growth in forest, lakes & ponds, rivers, built up area and roads goes at the expense of arable land, pasture, orchards, natural vegetation and vineyards. In total, between 1980 and 2013, 11.6% of Răteşti’s landscape changed (decrease and increase included). Between 1997 – 2013 this was 9.6% change. Most change took place between 1997 and 2003. Then, the total amount of landscape change was 8.4%. Table 4.2 shows the land use changes in Răteşti between 1980 and 2013 per land use category in hectares and the relative change in percentages.

From 2003 until 2013, the identified trends continued. Orchards and grassland almost entirely disappeared, and it is hypothesized that previously abandoned land is cultivated again. The disappearance of orchards and vineyards is not only typical for Răteşti, but is a general trend in all of Romania, where a decline of 22.3% for vineyards and a decline of 34.5% for orchards since 1990.238 This is mainly caused by the disappearance of knowledge concerning the maintenance of orchards and vineyards, combined with a decrease in investments and money to invest in these land use types.239 By 2005, an increase in fragmentation of agricultural land was observed.240 However, land abandonment rates remained largely stable.241 In 2009 a mineral extraction holding (gravel pit) was established over an area of 370 ha on the Argeş river shore, for mineral exploitation at the expanse of forest area.

The land use changes in Răteşti are mainly located between the Argeş river in the north, and the Neajlov river in the south (Figure 4-6). Most pasture is found in close proximity of the highway, surrounding the forests south of Răteşti, and surrounding Nejlovelu village. Here, some forest patches have turned into pasture between 1997 and 2003. The forest south of Răteşti stayed more or

235 Kuemmerle et al., 2009.
236 Sluis, van der, 2013, p.28.
237 Sluis, van der et al., 2013, p.28.
238 Ioja et al., 2011, p.116.
239 Ioja et al., 2011, p.116.
240 Kuemmerle et al., 2009.
241 Müller et al., 2009.
less the same, although some changes are identified where the forest turned into natural vegetation. The forest that was surrounding Mavrodolu in communist times has been largely transformed into permanent crops such as orchards between 1980 and 1997. The southern part of the municipality remained largely the same until 2003. Most changes took place between 1997 and 2003. The changes in the last ten years (2003 – 2013) mostly center in the south and south-eastern part of the municipality, which before remained largely stable. The changes between 1980 and 1998 are more located in the north-west of the municipality.

Nowadays, over 80% of the landscape is occupied by agriculture (cereal and vegetable crops) in Răteşti. Forests covers about eight per cent of the area, and around three per cent is listed by the municipality as flooding area from Argeş and Neajlov river. Pastures allow small animal production farms, and there is built up area. Farmers are using their land with a diversity of crops. Interviews for the VOLANTE project show that the majority of the farmers include the practice of crop diversification up to three types of cereal crop in an average year. Usually they grow wheat, corn, barley, oatmeal, sunflower, rapeseed, alfalfa and corn (highest percentage of crops). Also the garden plots are used for agricultural productivity, for own use. This can be difficult to sustain due to low and variable annual rainfall in the area.

The trends observed in Răteşti for this period slightly differ from the general trends in Argeş county, as the study of Kuemmerle et al. shows that that cropland declined by 7.5%, mostly in the period from 1990-1995. Grassland increased according this same source by almost 16%. Forest cover and forest fragmentation remained remarkably stable despite the widespread ownership transfers, they conclude. However, their study focused on the larger area of Argeş country, of which Răteşti is a municipality.

<table>
<thead>
<tr>
<th>Categories</th>
<th>ha in 1980</th>
<th>% rel. change</th>
<th>ha in 1997</th>
<th>% rel. change</th>
<th>ha in 2003</th>
<th>% rel. change</th>
<th>ha in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arable land</td>
<td>6041.2</td>
<td>0.59%</td>
<td>6095.7</td>
<td>-0.78%</td>
<td>6019.9</td>
<td>-0.58%</td>
<td>5974.2</td>
</tr>
<tr>
<td>Pasture</td>
<td>701.9</td>
<td>-0.24%</td>
<td>683.9</td>
<td>-2.23%</td>
<td>506.0</td>
<td>0.46%</td>
<td>542.7</td>
</tr>
<tr>
<td>Forest</td>
<td>482.9</td>
<td>0.38%</td>
<td>513.8</td>
<td>1.04%</td>
<td>595.0</td>
<td>0.00%</td>
<td>595.0</td>
</tr>
<tr>
<td>Lakes &amp; ponds</td>
<td>18.3</td>
<td>-0.01%</td>
<td>17.3</td>
<td>0.38%</td>
<td>47.6</td>
<td>0.00%</td>
<td>47.5</td>
</tr>
<tr>
<td>Rivers</td>
<td>44.1</td>
<td>-0.01%</td>
<td>43.6</td>
<td>1.02%</td>
<td>123.9</td>
<td>-0.05%</td>
<td>120.2</td>
</tr>
<tr>
<td>Built up</td>
<td>205.3</td>
<td>0.02%</td>
<td>206.8</td>
<td>1.48%</td>
<td>323.6</td>
<td>0.01%</td>
<td>324.4</td>
</tr>
<tr>
<td>Permanent crops – orchards</td>
<td>74.1</td>
<td>-0.43%</td>
<td>40.0</td>
<td>-0.36%</td>
<td>11.8</td>
<td>0.00%</td>
<td>11.8</td>
</tr>
<tr>
<td>Roads - Railroads</td>
<td>184.4</td>
<td>-0.01%</td>
<td>184.1</td>
<td>0.26%</td>
<td>204.4</td>
<td>0.15%</td>
<td>216.6</td>
</tr>
<tr>
<td>Natural vegetation</td>
<td>151.1</td>
<td>-0.23%</td>
<td>133.3</td>
<td>-0.83%</td>
<td>67.4</td>
<td>0.00%</td>
<td>67.5</td>
</tr>
<tr>
<td>Vineyards</td>
<td>5.0</td>
<td>-0.06%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>7908.3</td>
<td>0.13%</td>
<td>7918.5</td>
<td>-0.11%</td>
<td>7899.6</td>
<td>-0.11%</td>
<td>7899.9</td>
</tr>
</tbody>
</table>

Table 4.2 Land use changes in Răteşti between 1980 and 2013 per land use category. The total hectares and the relative change are displayed.

242 Kristensen, 2011, pp.31-35.
243 Kristensen et al., 2012.
244 Fraser & Stringer, 2009, p.50.
245 Kuemmerle et al., 2009.
246 Kuemmerle et al., 2009, p.1.
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Figure 4-7 Graph showing the relative change in percentage per land cover category for Răteşti between 1980 and 2013.

Figure 4-8a and 4.8b Change in percentage of land cover categories in Răteşti for the years 1980, 1997, 2003 and 2013.
**Parcellation pattern and field boundaries**

The parcels decreased in size, in the post-communist period. The significant changes in the structure and management of the agricultural systems led to the breakup of large farms into small (10-15 hectares) and very small (1-3 hectares) private farms.\(^{247}\) This also influenced the parcellation pattern as small patches of private property emerged in the landscape in Rătești.\(^{248}\) This fragmentation of agricultural surfaces lead to a diversification of the landscape, as farmers were free to cultivate whatever they wanted after the fall of communism.

There are different shapes of fields in Rătești municipality (Figure 4-9). The largest share consists of narrow fields such as the fields directly north of Rătești village. There are also large square fields, which look like remnants from communist times (e.g. in the South-East of Rătești municipality, south of Neajlov river). In close proximity of the villages there are very diverse small fields. The parcellation pattern is therefore very diverse. Also because the orientation of the patches differs to a great extent. The pasture parcels are more square, or take various shapes and sizes. They seem to fill up the space left between the agricultural fields.

![Figure 4-9 Different fields forming a diverse and irregular parcellation pattern in Rătești municipality, displayed on the aerial photograph of 2003. Source: Agentia Nationala de Cadastru si Publicitate Imobiliara, 2003.](image)

Nowadays, the parcels in Rătești municipality are grouped together into large agricultural and pasture areas, divided by roads and ditches. Within these larger areas, there are narrow strips of land,

\(^{247}\) Kristensen, 2011, pp.31-35.

\(^{248}\) Nitja, personal communication, April 25, 2014.
with no clear field boundaries. The last five years, Iojă states that large scale cultivations are emerging again in the Southern plain, especially due to investments of Western European firms. He thinks that this trend will increase, since it is possible for foreign citizens to buy land in Romania since January 2014.\textsuperscript{249} Also dr. Nitja sees this trend in the past ten years: “By either buying or leasing the land by private investors, both Romanian and foreign, and cultivating large surfaces of single crops, the pattern returns to the communist situation.”\textsuperscript{250}

Although the parcellation pattern was reversed and turned back to a larger number of small plots in the post-communist era, the field boundaries did not increase simultaneously. One of the reasons for this is the small size of patches, which makes it difficult to maintain the boundaries. The field boundaries are largely invisible, or indicated by very small landscape elements such as small ditches and trenches or border-stones, as a contact in Romania explains: “Each person might have its own indicators; some landmarks for the property limits. Everybody knows the boundaries. They are just not visible.”\textsuperscript{251} This is affirmed by another Romanian expert in geography, who called them ‘imaginary straight lines that delineate the land’.\textsuperscript{252} In general, agricultural fields continued until the next road, with no protection area between them, with exception of national and county roads. Another Romanian expert explained that the field boundaries are more present in the areas close to – and within the settlements, as there the boundaries are expressed by fences as also seen in proximity of Răteşti.\textsuperscript{253}

Nowadays, roads separate the different parcels, with sometimes not more than a sand trail, used for agricultural machines, but most often used by horse and carriage for transport of the crops (Figure 4-14). In some rare occasions, the roads are accompanied by tree lines, shrubs and reed belts, as for example on Figure 4-13. Most of the roads and field boundaries are accompanied by ditches – still used for irrigation, or decayed (Figure 4-18). Along the roads, generally shrub-vegetation is found.

\textit{Infrastructure and water system}

After the fall of communism it became clear that infrastructure had not improved too much as a result of centrally planned large scale agriculture. The poor infrastructure in combination with the general economic situation in Răteşti postponed the urban development.\textsuperscript{254} Between Bucharest and Piteşti, the most important highway in Romania is located, dividing the landscape visually and physically in two. It has four lanes, and there are different exits in the municipality. With the mechanization, also the highway grew and became more busy, which influenced the landscape. The secondary roads in Răteşti are not of very good quality which is related to the very cold winters and snow blizzards that damage the roads every year, which is not always repaired.

The past couple of years infrastructure increased, because the development of a few residential and recreational projects in the municipality, and due to the availability of European Union subsidies after the accession of Romania in 2007.\textsuperscript{255} However, still most common are non-paved secondary roads and trails, dividing the parcels and mainly used for agricultural transport (Figure 4-14). In one special area in Răteşti the infrastructure has been created for a neighborhood to be built (both in roads and electricity), but the neighborhood itself was never built (Figure 4-15; Figure 4-16). This created an image of a deserted landscape.

During communism, the water system was well organized, and relatively good. However, in post-communist times, this dramatically decayed and water systems fell into disrepair.\textsuperscript{256} This has been caused by the disappearance of central management, and the lack of parties to take up the maintenance. Along the rivers Argeş and Neajlov some water reservoirs were created for water

\addcontentsline{toc}{section}{References}

\textsuperscript{249} Iojă, personal communication, April 25, 2014.
\textsuperscript{250} Nitja, personal communication, April 25, 2014.
\textsuperscript{251} Iojă, personal communication, April 25, 2014.
\textsuperscript{252} Gavrilidis, personal communication, April 28, 2014.
\textsuperscript{253} Nitja, personal communication, April 25, 2014.
\textsuperscript{254} Kristensen, 2011, pp.31-35.
\textsuperscript{255} Kristensen, 2011, pp.31-35.
\textsuperscript{256} Iojă, personal communication, April 25, 2014.
retention, irrigation and intensive fishery (Figure 4-17). Close to the rivers and irrigation channels there tree-lines and shrubs (Figure 4-19) observed during fieldwork in August and October 2013. The irrigation system is not always functioning to the benefit of the garden plots surrounding the farms and villages, which is difficult for the production of food for own use. Some, but not all, irrigation channels are supported by concrete (Figure 4-21).

**Settlement structure and land ownership**

Răteşti municipality covers seven villages: Răteşti, Tigveni, Pătuleni, Furduești, Ciupa-Mânciulescu, Nejlovelu, Mavrodolu, with a population of approximately 3300 people in an area of 80 km2. The general settlement structure of the villages in Răteşti is linear, following the roads and rivers in the area, characteristic for the Southern Romanian plane. However, due to growth in the post-communist era, the structure has been slightly less linear, but more centered and compact, concentrated on the village centers (e.g. Mavrodolu and Nejlovelu). Not many changes appeared in village structure during the post-communist times, and only a slight growth has been observed in built up area from the land use maps (1.5%).

Many land users bought land during the post-communist times. Big farms were fragmented into private ownership. This happened all over Romania, but the nuances are different. For example, some private farmers bought land of one hectare in five different places in some areas, whereas in other areas, cooperatives remain the main land owners. Another trend observed in post-communist Răteşti is the buying of land by private investors, for agricultural or residential purposes. For example South-West of Ciupa-Mânciulescu, an area has been prepared for building a new neighborhood or small settlement by large investors. In absence of large scale investors after the most intense changes, the landscape remained more or less the same, as the people did not have the means to change the landscape. Former collective and state farms turned into no-man’s land after the fall of communism, abandoned, and into disrepair (Figure 4-22; Figure 4-23; Figure 4-24; Figure 4-25). Also for example a house of a former land owner has been abandoned and decayed, after his land was nationalized in communist times (Figure 3-1). A lot of new villas built on the edges of the settlements in Răteşti, land is owned and/or rented by:

- 97 individuals as natural persons;
- 3 individuals as Certified Natural Person;
- 1 family holding;
- 5 Limited Liability Companies;
- 3 churches.

The average farm size is 76 ha, varying from 1.6 ha for non-farmers to 102 ha for full-time farmers. Of these ownership structures, “42% of the properties were obtained by land restitutions, 26% by inheritance and 19% by purchase from others. Seven respondents were not owners of the land, three being managers of LLC, other three representatives of the church and there is one part-time farmer that has no area in property or in a long term lease contract but rents land to farm.”

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257 Kristensen, 2011, pp.31-35.
258 Fraser & Stringer, 2009, p.50.
259 Kristensen, 2011, pp.31-35.
260 Kristensen, 2011, pp.31-35.
261 Iojă, personal communication, April 25, 2014.
262 Nitja, personal communication, April 25, 2014.
263 Cosor, personal communication, August 15, 2013.
264 Kristensen et al., 2012.
265 Kristensen et al., 2012.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-10 Land use: Mainly agricultural landscape in the plain towards the river Argeș. Rătești. August 2013.

Figure 4-11 Land use: Mainly agricultural landscape in the plain towards the river Argeș. Rătești. August 2013.

Figure 4-12 Field boundary: Trail next to the field for agricultural use only, a small ditch and some bushes as field boundary. Rătești, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-13 Infrastructure: Secondary road flanked by treelines on both sides. Râtești, October 2013.

Figure 4-14 Infrastructure: Sand trail for agricultural use and a small river through pasture fields. Râtești, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-15 Infrastructure: Deserted infrastructure. A neighbourhood was planned here, but the plan was never executed. Rătești, October 2013.

Figure 4-16 Infrastructure: Deserted infrastructure. A neighbourhood was planned here, but the plan was never executed. Rătești, October 2013.

Figure 4-17 Water system: Water reserve for agricultural purposes surrounded by pasture fields. Rătești, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-18 Water system: Old decayed irrigation channel next to a secondary road. Rătești, October 2013.

Figure 4-19 Water system: Shrubs and tree’s next to a channel. Rătești, October 2013.
Figure 4-20 Water system: Concrete-supported decayed irrigation channel. Rătești, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-21 Water system: Concrete-supported decayed irrigation channel in pasture fields. Rătești, October 2013.

Figure 4-22 Land ownership: Former collective farm left to decay. Nobody is using the buildings or land surrounding it. Rătești, August 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-23 Land ownership: Former collective farm. Nobody is using the buildings or land surrounding it. Rătești, August 2013.

Figure 4-24 Land ownership: Former collective farm. Nobody is using the buildings or land surrounding it. Rătești, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-25 Land ownership: Former collective farm. Nobody is using the buildings or land surrounding it. Rătești, October 2013
4.4. Cultural landscape changes in Stâncuța in the post-communist period (1989-present)

Figure 4.26 Landscape changes in Stâncuța. The bright colors represent the changes between 1980 and 2013 per land cover category.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4.27 The location of change in Stăncuța between 1980 and 1997, 1997 and 2003 and 2003 and 2013. From this map only the location of changes is shown, not to which land use category the changes belong.
Land use

The process of restructuring the land ownership and farming systems after the fall of communism has been accompanied by significant land abandonment. However, a slow re-installment of rice plantations has been observed in the last years, starting approximately 2005. After communism, there was an increase in pastures, especially in close proximity of the villages in Stăncuța municipality, caused by the abandonment of agricultural fields. In the last ten years, especially in the north of the municipality, more pasture emerged. The last ten years have also been identified as the period in which the most changes occurred (Figure 4-27). Before that, the landscape in Stăncuța was relatively stable. This is caused by the accession of Romania to the European Union, and the availability of EU subsidies, but also due to the investments of an Italian investor in the rice plantations.

The VOLANTE project compared total productive land for the period of 1980-2003, and concluded productive land decreased from 57% to 43.5% as a result of an increase of forest area and river surface. Also housing and infrastructure increased in this period. Land use changes do not occur all over the area but seem to concentrate mostly near settlements in the center and west. In total 11% of the land use changed between 1980 and 2003, while 89% was stable. Some large arable fields were established, and along the Danube river some forests and few grasslands in the west. Meadows and pastures decreased by 1.8%. Former rice fields were abandoned, and developed into meadows. In 2003, some afforestation has been observed in Stăncuța. This afforestation follows the management plan of the National Forest Fund. In 2005 a shift from arable land to pasture has been observed.

When looking at the data from 1980 until present (2013), the biggest change is the decline of arable land since 1997. Where from 1980 – 1997 there was still a slight growth in agriculture of almost one per cent, from 1997 until 2013, arable land decreased with 4.5%. An opposite trend took place in Stăncuța, as pasture first declined with almost one percent, and after increased with 3.3%. The forest area remained mostly stable, after an increase of 0.5% from 1980 – 1997. The changes in built up area are negligible (slight increase of 0.2%). Vineyards disappeared entirely from the landscape. The disappearance of orchards and vineyards is not only typical for Stăncuța, but is a general trend in whole Romania, where a decline of 22.3% for vineyards and a decline of 34.5% for orchards took place since 1990.

Figure 4-28 and Figure 4-29 show the changes in relative percentages in Stăncuța between 1980 and 2013. From this it becomes clear that the growth in pasture, forest, rivers, built up area, and roads comes at the expense of arable land, lakes, orchards, natural vegetation and vineyards. The reason for the orchards and vineyards to almost entirely disappear is the lack of funds to invest in this type of land use, and also the disappearance of knowledge to maintain the orchards and vineyards due to aging. The decline in lake area can be explained by the season of the 2003 aerial photo, which was summer. The low water tide can have caused a difference in mapping. In total, between 1980 and 2013, 14.3% of Stăncuța’s landscape changed (decrease and increase included). Between 1997 – 2013 this was 11.5% change. Most change took place between 1997 and 2003. The total amount of change was 5.9%. However, this does not differ much with the total amount of change between 2003 and 2013, when the total change was 5.6%.

Nowadays, land use in Stăncuța comprises a mixture of agriculture, forestry and pasture, with agriculture being over 80% of the land area. The biggest part of this are the large scale rice plantations in the municipality aligning the Danube river in North-South direction. The western part of the Stăncuța municipality is also made up of large scale arable fields and pastures, but no rice fields are found in this area. This is also related to the geomorphology of the area: the land in the eastern part of the municipality lies between five meter below sea-level until five meter above sea-level, the western part of the municipality consists of small elevations and hills up to thirty meter above sea-level. The farmers in the region are cultivating a diversity of crops, with exception from the large rice farms, which are mono-specialized. The two large rice-farms are only willing to

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266 Sluis, van der et al., 2013, p.29.
267 Sluis, van der et al., 2013, p.29.
268 Kristensen et al., 2012.
269 Ioja et al., 2011, p.116.
270 Ioja, personal communication, April 25, 2014.
participate in a crop diversity scheme if the financial support is satisfactory. In close proximity of the villages, the households usually own land used for small scale vegetable, corn or wine productions for their own use.

The large majority of farmers uses up to three crops a year, the usual begin wheat, corn, barley, oatmeal, sunflower, rapeseed, alfalfa; the highest surface being wheat and corn. Also crops are cultivated in the garden plots close to the houses and villages. In Stâncuța, also big rice fields are present. Figure 4-31 shows these rice fields in August 2013. Close to the Danube river, outside the dykes, there are some areas where (production) forests are found, as well as some small pasture patches. The forests show clearly different stages of planting, as some of the forest is still quite young (Figure 4-33; Figure 4-34; Figure 4-35; Figure 4-36). Land in Stâncuța municipality is also extensively used for cattle and sheep grazing (Figure 4-37; Figure 4-38; Figure 4-39; Figure 4-40). Mostly, grazing takes place in road side verges, in pasture, and sometimes also in agricultural fields.

<table>
<thead>
<tr>
<th>Categories</th>
<th>ha in 1980</th>
<th>% rel. change</th>
<th>ha in 1997</th>
<th>% rel. change</th>
<th>ha in 2003</th>
<th>% rel. change</th>
<th>ha in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total arable land</td>
<td>13376.3</td>
<td>0.83%</td>
<td>13548.7</td>
<td>-1.67%</td>
<td>13109.1</td>
<td>-2.78%</td>
<td>12400.7</td>
</tr>
<tr>
<td>Total pasture</td>
<td>925.9</td>
<td>-0.96%</td>
<td>678.4</td>
<td>-0.67%</td>
<td>506.6</td>
<td>2.57%</td>
<td>1163.4</td>
</tr>
<tr>
<td>Total forest</td>
<td>7712.3</td>
<td>0.52%</td>
<td>7821.6</td>
<td>0.29%</td>
<td>7887.0</td>
<td>0.00%</td>
<td>7887.0</td>
</tr>
<tr>
<td>Total lakes &amp; ponds</td>
<td>28.3</td>
<td>-0.01%</td>
<td>25.2</td>
<td>-0.10%</td>
<td>0.0</td>
<td>0.01%</td>
<td>2.8</td>
</tr>
<tr>
<td>Total rivers</td>
<td>2774.2</td>
<td>0.03%</td>
<td>2774.2</td>
<td>2.11%</td>
<td>3310.1</td>
<td>0.00%</td>
<td>3309.5</td>
</tr>
<tr>
<td>Total built up</td>
<td>304.1</td>
<td>0.01%</td>
<td>305.1</td>
<td>-0.02%</td>
<td>300.8</td>
<td>0.20%</td>
<td>353.0</td>
</tr>
<tr>
<td>Permanent crops - orchards</td>
<td>12.2</td>
<td>0.00%</td>
<td>11.7</td>
<td>-0.05%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
</tr>
<tr>
<td>Roads - Railroads</td>
<td>229.4</td>
<td>0.00%</td>
<td>229.4</td>
<td>0.58%</td>
<td>377.1</td>
<td>0.00%</td>
<td>377.1</td>
</tr>
<tr>
<td>Natural vegetation</td>
<td>223.9</td>
<td>-0.11%</td>
<td>195.7</td>
<td>-0.44%</td>
<td>82.8</td>
<td>0.00%</td>
<td>82.8</td>
</tr>
<tr>
<td>Vineyards</td>
<td>90.2</td>
<td>-0.31%</td>
<td>9.3</td>
<td>-0.04%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td><strong>25676.8</strong></td>
<td><strong>-0.30%</strong></td>
<td><strong>25599.3</strong></td>
<td><strong>-0.40%</strong></td>
<td><strong>25573.5</strong></td>
<td><strong>-0.39%</strong></td>
<td><strong>25576.3</strong></td>
</tr>
</tbody>
</table>

Table 4.3 Land use changes in Stâncuța between 1980 and 2013 per category. The total amount of hectares per land use category and the relative change are displayed.

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271 Kristensen et al., 2012.
272 Kristensen et al., 2012.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-28 Graph showing the relative change in percentage per land cover category for Stâncuța between 1980 and 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-29 Change in percentage of land cover categories in Stâncuța for the years 1980, 1997, 2003 and 2013.
Parcellation pattern and field boundaries

The parcellation pattern in post-communist Stâncuţa became slightly more fragmented during the post-communist era, due to the restitution of land to pre-communist land owners. This restitution process has been executed following four phases which are further explained in Chapter 5. There was an increase in private property, with the tendency to decrease the size of parcels, emphasizing the irregular field pattern. However, there are great differences. The area North-South directly following the Danube river consists of large fields with rice cultivation. The areas in proximity of the villages in the Western part of the municipality are smaller, and use crop rotation schemes (see land use). In both areas, the parcels are small and long. In the western part of the municipality, the fragmentation led to a diversification of the parcellation pattern and landscape, as the farmers were free to cultivate whatever they chose. Due to a large Italian investor in the eastern part of the municipality, the landscape was homogeneous, and large scaled in parcellation pattern. Figure 4-30 shows the diverse parcellation pattern. From large scale rectangular rice cultivation patches in the east, to narrow and smaller scale patches in the west. Also, there are some small patches in close proximity of the villages.

Figure 4-30 Detail of the 2003 aerial photo showing the diverse parcellation pattern in Stâncuţa displayed on the aerial photograph of 2003. Source: Agentia Nationala de Cadastru si Publicitate Imobiliara, 2003.
Field boundaries are not much observed in Stâncuţa municipality. Respondents to the interviews state that the boundaries are mostly imaginary, as every land owner knows its land.\textsuperscript{273} For small property in close proximity of the villages, the land owners use field boundaries to a higher extent, but for the large agricultural fields, no visual field boundaries such as hedgerows were found. There, the fields are divided with (secondary) roads, trails and ditches. Figure 4-42 shows the dyke protecting the agricultural lands lying behind from the Danube river, which can overflow in winter and spring. Almost all parcels in Stâncuţa are surrounded by ditches, sometimes accompanied by elevations (Figure 4-43; Figure 4-44), or reed beds, although there are large differences between the eastern part and western part of the municipality.

\textit{Infrastructure and water system}

The infrastructure in Brăila county and Stâncuţa municipality remained more or less the same after the fall of communism.\textsuperscript{274} There are no railroads in Stâncuţa, and the road system does not seem to have changed a lot from the maps. The secondary roads in the area are not of good quality. Especially in the Eastern part of Romania, including Stâncuţa, there is a problem related to the winter season which brings snow blizzards and extreme cold which damages the roads.\textsuperscript{275} The quality of the secondary roads depends on the responsible parties such as localities and land owners.\textsuperscript{276} This in contrast to the communist times, where all road infrastructure was the responsibility of the national government. The last years since 2007 the quality of the roads is improving with EU-funding. Nowadays, there is a dyke with a road on top of it protecting the agricultural land and the villages from the sometimes overflowing Danube river (Figure 4-42), which has been constructed during communism. Most infrastructure in Răteşti municipality consists of secondary non-paved roads (Figure 4-45). They are mainly used for agriculture, and most vehicles are horses and carriages, and some tractors.

Stâncuţa municipality is partly located in a former flooding area. On the west side of the Danube river embankments and drainage channels were built after 1950 to obtain land for intensive agriculture.\textsuperscript{277} Later, in post-communist times, irrigation schemes were implemented using the water of the Danube and the inland rivers (also some groundwater sources) to irrigate the area of 250km\textsuperscript{2}. In 1965, the large hydro-technical pomp was installed, permitting the irrigation of around 1000 hectares in Stâncuţa.\textsuperscript{278} Without the irrigation system, the productivity of the agricultural land would be very low, making the irrigation system obligatory for agriculture.\textsuperscript{279} The irrigation systems developed in the communist period for increasing the productivity in this area are now almost totally destructed. Especially the first years after 1989 were detrimental to its reduction in size and functionality.

Irrigation schemes were implemented using the water of the Danube, the inland rivers and groundwater sources to supply the area. Figure 4-49 shows one of these irrigation channels, which are present in a high frequency in Stâncuţa. Almost all irrigation channels are covered with reed beds (Figure 4-48). The irrigation system relies on the Danube river due to the low and variable annual rainfall in the area. Today, the irrigation system can cover up to 205,000 hectares, but is not used in full capacity. There are, besides the large pump, ten floating units on the Danube, with a flow of 180 mc/s.\textsuperscript{280} Figure 4-51 and Figure 4-52 show that the Danube river has a low water tide in August (2013). Stâncuţa municipality has a large irrigation pump, pumping the water from the Danube into the agricultural fields (Figure 4-54). Within the municipality, there are also some water reservoirs located (Figure 4-55).

\textsuperscript{273} Iojă, personal communication, April 25, 2014; Nitja, personal communication, April 25, 2014.
\textsuperscript{274} Micu, personal communication, October 27, 2013.
\textsuperscript{275} Kristensen, 2011, pp.31-35.
\textsuperscript{276} Kristensen, 2011, pp.31-35.
\textsuperscript{277} Kristensen, 2011, pp.31-35.
\textsuperscript{278} Cosor, personal communication, May 4, 2014.
\textsuperscript{279} Iojă, personal communication, April 25, 2014.
\textsuperscript{280} Cosor, personal communication, May 4, 2014.
Settlement structure and land ownership

Stâncuţa is located 45 km south of the county capital Brăila (234 000 inhabitants). The municipality covers four villages: Stâncuţa, Stanca, Polizeşti and Cuza-Vodă, with a population of 3800 inhabitants. The settlements are compact settlements, concentrated along the village centers. The more compact village structures emerged as protection against the cold snow blizzards in the winter. After the fall of communism, the blocks of apartments in Stâncuţa maintained, and they are still in use today. There are some unused buildings from former state farms at the borders of the village, and spread through the rest of the landscape.

Ownership changed during the post-communist era. Farmers shifted from being only land users to land owners again, as they were (or their families were) before communist times. After decollectivisation, not only local farmers repossessed the land, but also foreign investors and other private investors. In Stâncuţa, an Italian agro-investor has restored and expanded a rice production scheme and is now cultivating 3500 ha of land. In contrast to this large scale landscape, former collective farm workers or local citizens who have received land under the privatization scheme or from land restitution process cultivate small farms measuring less than five ha. In the last couple of years, farmers started to buy land from elderly to merge the parcels, since their children have migrated to the cities and are not coming back to reclaim their inherited land.

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281 Kristensen, 2011, pp.31-35.
282 Nitja, personal communication, April 25, 2014.
283 Kristensen et al., 2013, p.8.
284 Kristensen et al., 2013, p.8.
285 Micu, personal communication, October 27, 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-31 Land use: Extensive rice fields. Stâncuța, August 2013.

Figure 4-32 Land use: Large agricultural field, surrounded by a dyke and an irrigation channel. Stâncuța, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-33  Land use: Forest regrowth next to the Danube river. Stâncuţa, October 2013.

Figure 4-34  Land use: Different stages of production forest. Here: newly planted production forest. Stâncuţa, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-35 Land use: Different stages of production forest. Here: a slightly older production forest. Stâncuța, October 2013.

Figure 4-36 Land use: Different stages of production forest. Here: an older production forest. Stâncuța, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-37 Land use: Sheep grazing in the road side verges. Stâncuța, October 2013.

Figure 4-38 Land use: Cattle grazing in road side verges. Stâncuța, October 2013.

Figure 4-39 Land use: Sheep grazing in large pasture fields. Stâncuța, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-40 Land use: Cattle grazing in agricultural fields. Stâncuța, October 2013.

Figure 4-41 Parcellation pattern: Rectangular, narrow and long patches. Stâncuța. October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-42 Field boundaries: Dyke close to the Danube river. Stâncuța, August 2013.

Figure 4-43 Field boundaries: Ditches and elevations as (former) field boundaries and old, decayed irrigation channels. Stâncuța, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-44 Field boundaries: Ditches and elevations as parcel boundaries and old and decayed irrigation channels. Stâncuța, October 2013.

Figure 4-45 Infrastructure: Secondary non-paved road, mainly used for agriculture. Stâncuța, October 2013.
**Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)**

*Figure 4-46 Infrastructure: Main road accompanied by tree lines. Stâncuța, October 2013.*

*Figure 4-47 Infrastructure: Main road accompanied by a paved ditch. The tree line had to give way for this. Stâncuța, October 2013.*
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-48 Water system: Irrigation channels covered in reed beds. Stâncuța, August 2013.

Figure 4-49 Water system: Irrigation channel in use. Behind: rice fields. Stâncuța, August 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-50 Water system: Paved irrigation channel. Stâncuța, October 2013.

Figure 4-51 Water system: Low water tide in a side river of the Danube. Stâncuța, August 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-52 Water system: Low water tide in the Danube. The depression in the landscape is a side river of the Danube during winter, when the water tide is a couple of meters higher. Stâncuța, August 2013.

Figure 4-53 Water system: Large irrigation channel. Stâncuța, October 2013.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Figure 4-54 Water system: Large irrigation pumps pumping the water from the Danube into the irrigation channels. Stâncuța, October 2014.

Figure 4-55 Water system: Water reservoir for agricultural use. Stâncuța, October 2013.

Figure 4-56 Settlement pattern: An impression of Stâncuța village. Stâncuța, October 2013.
4.5. Synthesis of trends in cultural landscape changes in Rătești and Stăncuța in the post-communist period (1989 – present)

The cultural landscape changes in Rătești in the post-communist period (1989 – present) can be traced back to several trends. The first important trend is the continuity in land use over the long period of 25 years. The observed changes in land use are relatively small, and not always significant. This can be explained due to the good natural conditions (fertile soil), easy market access and therefrom resulting profitable farming. The total amount of land use changes between 1980 and 2013 is around 11.5% in Rătești and 14.3% in Stăncuța. A second trend in landscape changes is the downscaling in parcellation pattern, causing land fragmentation. During the last 25 years, large scale farms have been broken up into small (10–15 ha) and very small (1–3 ha) private farms, on average divided over ten to twenty parcels per private farmer. This process can be explained by the decollectivisation process further analyzed in chapter five. A third trend in landscape changes is the degradation of infrastructure, water system and the degradation related to settlement structure. This degradation is mainly caused by the disappearance of national management, and the lack of substituting general management after the fall of communism. Also, the small scale farmers did not have the means to maintain the systems. The last trend in landscape changes is the privatization in ownership structures due to the decollectivisation process. Land was restituted to the pre-communist land owners, which is strongly related to the changes in parcellation pattern.

4.6. Comparing the post-communist landscape changes in Rătești and Stăncuța and other cases from Eastern Europe

Land use

The main post-communist trend in many Eastern European landscapes is land abandonment, which is occurring in unprecedented rates, as study form Kuemmerle et al. shows. They state that large areas are converting from agricultural land to grassland and forest due to abandonment, and that secondary succession and forest regrowth on marginal arable land have enhanced this trend in the post-communist period. For example, they observed an abandonment rate of 21% in South-Eastern Romania. However, more recent studies nuance these findings, stating that abandonment rates in South-Eastern Romania depicted only 9% abandoned farmland.

Another example is Latvia, where land abandonment goes together with forest increase, and the abandonment rate is around 16.8%. In Latvia, a strong decrease in agricultural land has been observed, concomitant with an increase in uncultivated agricultural lands. Especially in areas where there was little scope for amelioration and large scale agriculture, forest area expanded. Given the natural and climatic conditions in Latvia, these abandoned lands quickly reverted to forests, causing great transformations in the landscape. Especially in the uplands of the province of Vidzeme, Latvia, the changes are big. "Subsequent to the collapse of Communism and the restitution of land to the original landowners, many of whom are old, non-resident or not interested in agriculture, land abandonment started and has continued to the present day. This is manifested by scrub growing on

287 Kuemmerle et al., 2006.
288 Alcantara et al., 2013.
289 Alcantara et al., 2013.
290 Bell et al., 2009, p.443.
291 Nikodemus et al., 2005, p.58.
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

Many fields, a sign of their eventual transformation into forest.292 Another example is Estonia, where 30% of agricultural lands used in Soviet times had been abandoned by 1993. The general idea is that especially on formerly state owned land, land abandonment is common, and is often accompanied by shrub encroachment.293 This is can be explained by the lack of investment of the national governments, who are still the owners of some of the former collective- and state farms. A more recent study of Alcantara et al showed that by 2013, the abandonment rate in Estonia has decreased to almost 17%.294

When comparing Rătești and Stâncuța with these findings, the most striking difference is concerns the scale of changes. Where only small changes emerged in South-Eastern Romania, in other case areas, decollectivisation caused immense large scale changes concerning land abandonment. In this study, there were no significant findings of land abandonment in the municipalities, whereas other studies identified abandonment in South-Eastern Romania between 9% – 21% of the total land area.295 These differences can be explained by the fact that the Eastern European case study areas are located in more remote areas, causing marginalized lands. Especially in North-Eastern Eastern Europe and in the mountainous areas, land abandonment rates are high (Figure 4-57).

![Figure 4-57 Abandonment rates by administrative units (country-scale for small countries, state/province scale for larger countries). Blue colors relate to low abandonment rates, yellow to medium abandonment rates, red to high abandonment rates. Source: Alcantara et al., 2013, p.6.](image)

In Rătești and Stâncuța, the total land use changes from 1980 until 2013 were respectively 11.6% and 14.2%. Comparing this with case studies from for example Latvia, these changes are very small. There, the landscape changed with approximately 44% in Dzerbene, Priekule and Vecpiebalga municipalities, and approximately 30% in Vecsaule, Barta and Nautreni municipalities between 1990 and 2000.296 The case studies are comparable, expecially Vecsaule, Barta, Priekule and Nautreni,

292 Bell et al., 2009, p.428.
293 Kuemmerle et al., 2006, p.463.
294 Alcantara et al., 2013.
295 Kuemmerle et al., 2006; Alcantara et al., 2013.
296 Bell et al., 2009, p.440.
which are similar in soil type and quality (luvisols and chernozem soils), topography (plain, lowland) and municipality size. The main changes occurred there were an increase in forest area (average 17% increase), and decrease in agricultural area (average 9% decrease). The categories in which the change have been observed correspond with Răteşti and Stăncuţa, although the changes are much smaller with an average forest area increase of 1% and an average decrease of agricultural area of 2.5% between 1980 and 2013. The large differences are traced back to different historical events, policy changes, socioeconomic developments and also social factors, which are further explained in Chapter five.

The limited changes in Răteşti and Stăncuţa are surprising, considering the immense changes that have taken place in the Romanian countryside. However, they are not rare, as also in other countries the changes have been small. For example in Albania, where the study of Müller and Sikor has shown that the landscape changes per category between 1988 and 2003 are also all below 10%. For example, forest first increased with 3% between 1988 and 1996, and after decreased with 3% between 1996 and 2003. Cropland increased by 6.5% between 1988 and 2003. The similarities can be explained by the comparable decollectivisation processes in Albania and Romania.

Overall, Răteşti had better natural conditions than Stăncuţa, and easier market access, which benefited the development of profitable farming and therefore the increase of agriculture. The differences between the two areas are highlighted in Table 4.5 below, for the post-communist era, based on the set of indicators. The results of the study show that there are more similarities than differences between Răteşti and Stăncuţa. Both Stăncuţa and Răteşti were quickly collectivized in the 1950s, and that to that account, they are similar. Both areas are characterized by wide open agricultural plains, with few small scale landscape elements such as tree lines and hedgerows. Also, both areas were fairly stable over the past twenty-five years. For both areas, most changes occurred between 2000 and 2005 (Table 4.5). Both areas are representative for other agricultural landscapes in South-Eastern Romania.

**Parcellation pattern and field boundaries**

The parcellation pattern changed rigorously throughout Eastern Europe after the fall of communism. One of the main processes concerning these changes is land fragmentation. In Albania, the decollectivisation of cooperative land produced more than 379,000 family holdings of each 0.8-2 ha, and with an average size of 1.85 ha after the fall of communism. It is comparable with the small field size in South-Eastern Romania (average <5 ha), but extremely different from for example the Czech Republic, where the average field size is 89.3 ha. In the Czech Republic the size of holdings remained very large, as 86% of the utilized agricultural land was leased by cooperative farms from new owners, but mostly within the communist farm structures. Also in Hungary a large scale landscape preserved after the fall of communism, as co-operative farms were maintained as business entities after the fall of communism, even though the participating farms were privatized. The small scale and fragmented character in for example Romania and Albania is caused by the complete breakup of large-scale collective and state farms after the fall of communism. Fragmentation in rural landscapes is observed highest where private land ownership was allowed during socialist times, as for example in Romania, and where state farms were dissolved and the land was made available to the people, as for example in Ukraine or the Baltic States.

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297 Bell et al., 2009, pp.439-443.
298 Bell et al., 2009, p.443; Nikodemus et al., 2005.
299 Müller & Sikor, 2006.
300 Müller & Sikor, 2006.
301 Sluis, van der, 2013, p.28.
302 Sluis, van der et al., 2013, pp.42-43.
303 Micu, personal communication, October 27, 2013.
305 Hartvigsen, 2014, p.337.
308 Kuemmerle et al., 2006, p.463.
Besides the size, also the spreading of the parcels influenced the parcellation pattern. For example, in Romania, the land is spread over ten to twenty parcels, which is high compared to other Eastern European countries. In Albania, in early 1990s the average of 1.05 ha was divided into two to five parcels. By 2011, the average increased to 1.26 ha of agricultural land, divided into 4.7 parcels with an average parcel size of 0.27ha. Field boundaries and other small scale landscape elements already largely disappeared throughout Eastern Europe during communism: “Initially, increased landscape heterogeneity has been observed during the post-communist times, which may later change to become a more homogeneous landscape.” The underlying processes and mechanisms of different land reforms and resulting land fragmentation and spreading of the parcels in Eastern Europe is further discussed in part II of the thesis.

<table>
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<tr>
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<th>Level of fragmentation of land use in agricultural land</th>
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</table>

Table 4.4 Current level of ownership and land use fragmentation in 25 Central and Eastern European Countries. Source: Hartvigsen, 2014, p.339.

**Infrastructure and water system**

Infrastructure was organized on national scale during communism, and after, different parties became responsible for the organization and maintenance of the roads and water systems. Therefore in almost all Eastern European countries, the systems which required maintenance broke down after the fall of communism. This has also been observed in Rătești and Stâncea. The collapse of ‘socialist’ infrastructure was due to low investments in all post-communist economies, and also “caused by the radical change in production and trade patterns, causing an equivalent radical change in the use of infrastructure.” For example, between 1989 and 1994, a decline of over 50% has been observed in rain freight volumes. In the last years, especially after Eastern European countries joined the

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310 Bell et al., 2009, p.428; Nikodemus et al., 2005, pp.57
311 Bell et al., 2009, p.443
European Union in 2004 and 2007, infrastructures are starting to develop again, sometimes with the help of European funds.\textsuperscript{314}

**Settlement structure and land ownership**

Historically, the villages in Eastern Europe are ubiquitous as form, because in feudal times a nucleated settlement was created near the landlord’s house, which provided water and protection, and common fields were used for agriculture. However, many villages have been altered by the process of modernization, introduced in the communist times.\textsuperscript{315} Rugg: “The layout of the villages in Eastern Europe varies considerably: irregular, wherever settlement took place over a long period, a feature especially evident in mountainous regions; regular in those areas where German colonization took place, because linear villages were easily established.”\textsuperscript{316} Therefore, in general the settlement pattern in Eastern Europe is more regular, consisting of mainly linear village types, than in Western Europe, where irregular forms dominate.\textsuperscript{317}

The most important case study on post-communist settlement structures is from Latvia. The results show that there are changes in settlement types, with a reduction in the traditional settlement types.\textsuperscript{318} Traditional settlement types are identified as 1) homogeneous dispersed farmsteads, found in open and mainly arable plains; 2) areas of dispersed farmsteads with occasional linear concentrations along valleys; 3) most farmsteads in small hamlets with a few scattered ones in between; 4) almost all farmsteads in small hamlets; 5) clusters of houses in hamlets; 6) linear settlements along roads.\textsuperscript{319} In Rătești, mostly linear villages are observed, and in Stăncuța, mainly homogeneous dispersed farmsteads were found. The disappearance of traditional settlement types is mainly because also in Latvia, settlement patterns changed as people were moved into blocks of flats constructed in the new village centers, together with new production facilities, during communism.\textsuperscript{320} The construction of blocks has also been observed in Stăncuța village, although the loss in cultural landscapes as identified in Latvia does not seem to appear there. Mainly because in both Rătești and Stăncuța, built up area did not increase nor decrease in post-communist times. The researchers state that in Latvia “there is no longer any extensive traditional cultural landscape left from before the Soviet era and that, whilst smaller relics may survive, the dominant character is formed from the activities of the collectivization period.”\textsuperscript{321} Overall in Eastern Europe, and also in Rătești and Stăncuța, the most important changes in settlement structure have been dominated by changes that took place during communism, rather than during post-communism, when continuity took place due to shortage of money and investments.\textsuperscript{322}

Diverse rural property relations have emerged within the broad shift in ownership, after the communist period. Land was restituted to the former owners, shifting the ownership from large collective and state farms, to more private ownership. However, there are large regional differences within Eastern Europe where in some countries, farmers united into bigger co-operative enterprises (e.g. Czech Republic), and in others, almost all land was restituted to small private farmers (e.g. Romania).\textsuperscript{323} These differences are influenced by pre-reform farm structures, land reforms, privatization policies and broader agricultural policies, more explained in Chapter five.\textsuperscript{324} Ownership in Eastern Europe knows different forms such as farming landowners, landowners with additional leased land, partnerships such as joint ownership and operation, various types of cooperatives and private companies working land leased from hundreds of land owners.\textsuperscript{325}

\begin{flushleft}
\textsuperscript{314} Bell et al., 2009, p.428  
\textsuperscript{315} Rugg, 1985, p.112.  
\textsuperscript{316} Rugg, 1985, p.112.  
\textsuperscript{317} Rugg, 1985, p.112.  
\textsuperscript{318} Bell et al., 2009, p.444.  
\textsuperscript{319} Bell et al., 2009, p.428.  
\textsuperscript{320} Bell et al., 2009, p.428.  
\textsuperscript{321} Bell et al., 2009, p.453.  
\textsuperscript{322} Bell et al., 2009, p.444.  
\textsuperscript{323} Dijk, van, 2007, pp.506-507.  
\end{flushleft}
4.7. **Conclusion**

The study has shown that concerning land use, the changes are not that large in Răteşti and Stăncuţa, considering the long period of twenty-five years. The total change in land use in Răteşti is around 11.6%. The total change in land use in Stăncuţa is 14.3%. In Răteşti, mostly pasture and forest changed into cropland, which involved large extended fields, mostly along the river from North-West to South-East. Also, grassland and forest expanded. There is almost no change in built up area in both municipalities. Today, in both areas, the land use consists of a mixture of agriculture, pasture and forest (Table 4.5).

The findings suggest that in general, land fragmentation occurred in post-communist era in both Răteşti and Stăncuţa. However, these changes are not significant. The study has found that in both areas, field boundaries are not physical. The infrastructure and water system degraded in post-communist times. These findings were supported during fieldwork in August and October 2013, as many channels were decayed and not in use anymore. The settlement structures in the case study areas are very different. Where Răteşti has mainly linear villages, Stăncuţa knows more concentrated villages. However, both remained largely the same during the last twenty-five years. A slight growth in built up area has been identified in Răteşti (1.5%) and Stăncuţa (0.2%). More changes have been found in ownership structures, where land restitution caused the emergence of private property holdings. Overall, the post-communist landscape changes in Răteşti and Stăncuţa are quite similar, and they seem to represent the average South-Eastern Romanian rural landscapes.

The main trends observed in post-communist Eastern European land use are land abandonment and land fragmentation. However, the changes between countries are extensive. The two trends seem to be the result of a shift in ownership and secondary processes such as changes in parcellation pattern, which also caused a decay in infrastructure and water systems, as the central organization was transferred to individual management. The trends observed in Răteşti and Stăncuţa are comparable with the general trends in Eastern Europe. However, in the two South-Eastern Romanian cases, land abandonment is less severe than in the rest of Eastern Europe. On the other hand, land fragmentation is relatively higher in Răteşti and Stăncuţa compared to other Eastern European countries due to the splitting of parcels in ten to twenty parcels per farmer.

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326 Kuemmerle et al., 2006, p.450.
### Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Rătești</th>
<th>Stăncuța</th>
<th>Similarities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical geography</strong></td>
<td>Climate: continental, precipitation 600-700mm/y; Soil: luvisol, chernozem and brown forest soils; Original vegetation: forest; Area municipality: 79km²; Geomorphology: Hills and lowlands.</td>
<td>Climate: dryer, continental precipitation 500mm/y; Soil: chernozem. More fertile soils than in Rătești; Original vegetation: forest-steppe; Area municipality: 255km²; Geomorphology: Floodplain.</td>
<td>Soil: chernozem and loess; Geomorphology: plains.</td>
</tr>
<tr>
<td><strong>Land use</strong></td>
<td>Pasture decreased (2%); Vineyards increased (0.1%).</td>
<td>Pasture increased (1%); Vineyards decreased (0.4%).</td>
<td>Predominantly agricultural land use (cereal crops); Rătești -1.0%/ Stăncuța -3.6%</td>
</tr>
<tr>
<td><strong>Parcellation pattern and field boundaries</strong></td>
<td>Small scale parcellation pattern.</td>
<td>Bigger parcels for rice cultivation in the eastern part of the municipality; Small scale parcellation pattern in the western part of the municipality.</td>
<td>Land fragmentation; Long and narrow fields; Disappearance of small field boundaries.</td>
</tr>
<tr>
<td><strong>Infrastructure and water system</strong></td>
<td>Drainage of agricultural land due to the presence of groundwater and the location of Rătești on the subsidence plain; Argeș and Neajlov rivers.</td>
<td>Irrigation of agricultural land due to the extremely dry climate; Danube river.</td>
<td>Degradation of infrastructure and water systems;</td>
</tr>
<tr>
<td><strong>Settlement structure and land ownership</strong></td>
<td>Seven villages; Linear settlement structure.</td>
<td>Four villages; Concentrated settlement structure;</td>
<td>No significant changes in settlement structure; Ownership shifts to private farming.</td>
</tr>
</tbody>
</table>

*Table 4.5 Differences (first two columns) and similarities (last column) of landscape change in the post-communist era (1989-2013) between Rătești and Stăncuța. The first two columns represent the differences, the last column represents the similarities between Rătești and Stăncuța.*
Cultural landscape changes in South-Eastern Romania in the post-communist period (1989-present)
PART II: Decollectivisation

In the previous part of the thesis, the changes Răteşti and Stăncuţa are described, analyzed and compared, also in a broader Eastern European context. This analysis focused on the actual physical landscape, and what has changed over time. The second part of the thesis takes the analysis one step further. It focuses on decollectivisation as driving force of landscape change, and explains the underlying mechanisms of landscape change. Aim of this part is to describe, explain and compare the phenomena in Răteşti and Stăncuţa, again also in comparison with other examples from Eastern Europe with the aim to assess the relative importance of decollectivisation as driving force of landscape change.
5. Decollectivisation as a driving force of landscape change

5.1. Introduction

The transition to free-market-oriented economy after the fall of communism in 1989 drastically changed the political, socio-economic, and demographic structures in Eastern Europe. State-support for agriculture disappeared, new land management policies were issued, and land reforms resulted in massive land ownership transfers.\(^{327}\) The landscape changes are to a large extent, but in various degrees, caused by these developments. During communism, a socialist reorganization of agriculture was carried out in Eastern Europe. As in Romania, it concerned a collectivization and nationalization of agricultural holdings according to the Soviet models. The state farms and collective farms became dominant in almost all Eastern European countries, except Poland.\(^{328}\) This collectivization process was finished around the 1960s, and a planned economy emerged.

However, in each area (between and within countries) the developments were different as factors influencing the system differed. For example, in Albania the socialist state controlled all land, controlled the flow of produce and inputs and isolated the country from the West and East, whereas in Romania, not all land was nationalized, and private farming was still possible in the mountainous areas. Nevertheless, the goal was the same in all the countries: central planning towards pre-established targets. This had its repercussions on the landscape, as large scale agricultural projects destroyed many of the most distinctive pre-existing landscape features, such as field boundaries, drainage systems, local track networks, mixed farming systems, including small-scale forestry, and a multitude of traditional farm buildings.\(^{329}\)

5.2. Conceptualizing decollectivisation

Decollectivisation was the main process which took place in agriculture after the fall of communism. Decollectivisation is a process that had strong reflections on the mainly agrarian rural landscapes in Eastern Europe. Trends that were distinguished, are the re-organization of state enterprises as autonomous units, the abolishment of centralized planning and the creation of the premises for basing agriculture on private ownership.\(^{330}\) Putting the concepts into practice, these processes are referred to as ‘turning back the clock’ to pre-communist conditions, including land ownership structures.\(^{331}\) This has frequently resulted in “the division of large economically efficient units into numerous, small and economically barely viable private plots”.\(^{332}\)

Decollectivisation is strongly related to concepts such as privatization, property rights, restitution and land ownership. As seen in the introduction, decollectivisation is defined as ‘the breakup of large-scale agricultural production units into individually operated farms’.\(^{333}\) Decollectivisation causes individually operating farms (‘individual farms’) and their creation as autonomous production units independent of the government.\(^{334}\) The ownership changed, as, the land of farmers’ co-operatives and state farms was returned to the legal owners of the land prior to the communist land confiscation and forced collectivization.\(^{335}\) The process of decollectivisation is complex, and therefore first a couple of concepts concerning decollectivisation are explained before looking at the developments of Romanian decollectivisation over time.

\(^{327}\) Lerman et al., 2004; Mathijs & Swinnen, 1998.
\(^{328}\) Csáki, 1990, pp.1237-1238.
\(^{330}\) Gravilescu, 1994, p.178.
\(^{331}\) Dijk, van, 2007, p.505.
\(^{332}\) Dijk, van, 2007, p.505.
\(^{334}\) Pryor, 1992.
\(^{335}\) Dijk, van, 2007, pp.505-506.
Decollectivisation as a driving force of landscape change

To understand decollectivisation, it is also good to have a look at what preceded decollectivisation: collectivization. Csáki and Lerman explain: “Socialist agriculture in East-Central Europe and Former Soviet Union was traditionally based on the Soviet model of large-scale mechanized farm enterprises cultivating thousands of hectares of land and employing hundreds of people. The socialist farm, like any industrial enterprise, was an integral part of the centrally planned national economy. The objective of agriculture policy was to produce the quantity of food needed to satisfy the planned level of personal consumption and industrial demand: self-sufficiency.” The political-economic system aimed at low food prices and low wages, which were artificially kept low. Quantity had priority over quality, and increasing agricultural production was the most important.

The concept of privatization is interchangeably used with decollectivisation. The distinction being the difference in rights that were transferred from collectivization to either privatization or decollectivisation. Privatization refers to the transfer of legal ownership rights and effective property rights to individuals or private institutions, and decollectivisation refers to the transfer of ownership rights. The concepts are both used when describing the change from state-ownership to individual-ownership after the fall of communism. Barzel defines property rights of individuals over assets as ‘the rights, or the powers, to consume, to obtain income from, and to alienate these assets’. Aim of privatization was to establish a viable structure of private sector farming, expecting high productivity and profitability of individual farming.

A fourth concept to describe the processes concerning property after the fall of communism is restitution. Restitution refers to a form of privatization that returns property rights to those defined as ‘legitimate’ owners from before the communist era. However, this process was sometimes difficult, as original assets not always existed anymore, or had decreased dramatically in quality. Also, sometimes plots that had little infrastructure might have drainage and irrigation systems, or even buildings on them, or were consolidated with other fields, creating new infrastructures. “Plots of land which prior to collectivization were adjacent to a road might now be in the middle of a grain field. Plots previously located close to villages might now be far away.”

5.3. Developments in Romanian decollectivisation

Collectivization and later on, decollectivisation, did not emerge overnight. In 1945, after the Second World War, the first agrarian reform law was passed to collectivize the agricultural land from holdings larger than fifty hectares. After this first law, several other laws followed nationalizing almost all land area. In 1949, another law confiscated all estates, land and buildings (including the family home), of around fifty hectares that were excepted from the previous 1945 land reform law: “All livestock, agricultural and semi-industrial equipment and all ‘the goods and the materials that may be used in agriculture’ were transferred to the state.” In 1959, a further confiscation Decree was passed, confiscating all privately owned land which was not directly cultivated by the owner and his family. The period of over a decade between 1945 and 1959 has therefore been called ‘the socialist transformation of agriculture’, establishing collective and state farms. The collectivization process was completed in 1962. A very small private sector still remained, mostly located in the mountainous areas in North-west Romania: “In 1989 around 28 per cent of the total agricultural land in the country was in the state sector, the collectives accounted for around 65 per cent while the

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Decollectivisation as a driving force of landscape change

rest was held in private, usually mountain farms and in small personal allotment plots.”346 The phasing of the collectivization process is displayed in Table 5.1.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Period</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I: Collectivization of holdings larger than 50 ha.</td>
<td>1945 – 1949</td>
<td>In 1945 the first agrarian reform law was passed to collectivize the agricultural land from holdings larger than 50 ha.</td>
</tr>
<tr>
<td>Phase II: Collectivization of holdings around 50 ha.</td>
<td>1949 - 1959</td>
<td>In 1949 land laws were implemented confiscating all estates, land and buildings (including family homes) of around 50 ha that were excepted from the 1945 agrarian reform law.</td>
</tr>
<tr>
<td>Phase III: Collectivization of all privately owned land.</td>
<td>1959 – 1962</td>
<td>In 1959 a Decree was passed, confiscating all privately owned land which was not directly cultivated by the owner and his family. The collectivization process was completed in 1962.</td>
</tr>
</tbody>
</table>

Table 5.1 The three phases of the collectivization process between 1945 and 1962, when the collectivization process was completed, according to three agrarian reform laws.

After the implementation of the agrarian reform laws in 1945, 1949 and with the end of the collectivization process in 1962, the production structures of farms have remained almost unchanged until the fall of communism in 1989.347 This year marked a fundamental turning point for Romania. A transition from planned market economy to free markets was put in motion, marking the beginning of a complex and long-term process.348 The situation of agricultural land utilization in 1989 is represented in Table 5.2.

<table>
<thead>
<tr>
<th>Total agricultural land</th>
<th>Arable land</th>
<th>Pastures</th>
<th>Hay fields</th>
<th>Vineyards</th>
<th>Orchards</th>
</tr>
</thead>
</table>
| Private producers' holdings | 9.5% | 5.0% | 7.5% | 44.7% | 3.7% | 16.5%
| Agricultural production cooperatives | 60.8% | 72.3% | 46.8% | 46.8% | 68.3% | 53.5%
| State farms | 13.6% | 16.5% | 4.2% | 4.2% | 20.7% | 18.6%
| Other state units | 16.1% | 6.2% | 4.3% | 4.3% | 7.3% | 11.4%
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |


Soon after the fall of communism, Land Law 18 emerged, which is the most important law concerning decollectivisation, and therefore also the most studied law concerning decollectivisation.349 It is the so-called “Land Restitution Law”, “Law on Agricultural Land Resources”, “Land Fund Act” or in short, “Land Law” that was enacted in early 1991. In short, Law 18 “stipulated the constitution and re-constitution of property rights to land, starting with the earlier collective farms.”350 It liquidated collective farms and returned the land to the former owners.351 The most important feature of the Law was the fact that a family or an owner could not receive less than 0.5 hectares and more than 10 hectares, regardless what the size of ownership was before collectivization. This was done to prevent large differences in the level of holdings between land

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346 Cartwright, 2000, pp.2-3.
348 Goetz, Jaksch & Siebert, 2001, p.57.
350 Rusu et al., 2002, p.3.
 owners, and in anticipation of the large number of expected land claims. Land Law 18 attempted to recreate the property situation that had existed forty to forty-five years earlier.\textsuperscript{352} The restitution of the land was different for the mountainous and plane regions in Romania. In the mountainous regions, land was restituted and assigned to the former owners in its previous location. In the plain regions, land was also restituted to the former owners, but this was not always in its previous location. However, land from the same quality and size was generally restituted. Only the location could vary.\textsuperscript{353} In whole Romania, property rights were given to each landowner who was forced to join a collective farm during communism. When the landowner died during that period, the rights were transferred to the heirs, who had to divide the land between them.\textsuperscript{354} Landless farm employees who had worked for at least three years in a cooperative also were assigned to land ownership rights following a ‘constitution arrangement’. Also young landless families who were willing to move to the countryside and start farming were assigned with ownership rights.\textsuperscript{355} By 1993, around forty-three per cent of agricultural land was voluntarily restituted to cooperative forms of production.\textsuperscript{356} Forestland was also affected by Law 18. Some 350,000 hectares of forests were restituted to their former owners. The individuals could get up to one hectare of forest restituted per individual, or ten hectares per family, regardless of the previous forest area they possessed.\textsuperscript{357} Resulting from this, approximately 353,000 hectares were returned to more than 400,000 former landowners or their descendants.\textsuperscript{358} To avoid fragmentation, these small areas were grouped together and located in isolated forest areas or at the forest border.\textsuperscript{359} The next land law concerning the ownership right reconstitution of agricultural and forest land was Law 1/2000. By this law, it was possible to reconstitute the land formerly owned over ten hectares, but within the limit of fifty hectares per owner.\textsuperscript{360} Based on Law 1/2000 it was possible to get up to ten hectares of forest restituted for individuals. Also the forests that were previously owned by towns, villages, churches and schools was restituted, up to twenty hectares per community member, or thirty hectares for churches and schools.\textsuperscript{361} By the year 2004 the privatization process was practically completed, after a generally successful process, although in some cases there were some corruption suspicions.\textsuperscript{362} Law 247/2005 was the last restitution step. It stated the last corrections in the field of agricultural land ownership restitution, before Romania’s accession to the European Union. It also modified and completed Law 18/1991.

<table>
<thead>
<tr>
<th>Ownership type</th>
<th>Thous. hectares</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>10,989.2</td>
<td>74%</td>
</tr>
<tr>
<td>Legal entities</td>
<td>1,298.8</td>
<td>9%</td>
</tr>
<tr>
<td>Individuals</td>
<td>9,690.4</td>
<td>65%</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Private-domain”-privatizable</td>
<td>3,867.6</td>
<td>26%</td>
</tr>
<tr>
<td>State</td>
<td>3,235.3</td>
<td>22%</td>
</tr>
<tr>
<td>Counties and municipalities</td>
<td>1,015.7</td>
<td>7%</td>
</tr>
<tr>
<td>“Public-domain”-non-privatizable</td>
<td>2,219.6</td>
<td>15%</td>
</tr>
<tr>
<td>State</td>
<td>632.3</td>
<td>4%</td>
</tr>
<tr>
<td>Counties and municipalities</td>
<td>418.4</td>
<td>3%</td>
</tr>
<tr>
<td>State</td>
<td>213.9</td>
<td>2%</td>
</tr>
<tr>
<td>All agricultural land</td>
<td>14,856.8</td>
<td>100%</td>
</tr>
</tbody>
</table>

\textit{Table 5.3 Type of land ownership in Romania, December 2000. Source: Dawidson, 2005, p.621.}

\textsuperscript{352} Rusu \textit{et al.}, 2002, p.10.  
\textsuperscript{353} Rusu \textit{et al.}, 2002, p.3.  
\textsuperscript{354} Rusu \textit{et al.}, 2002, p.3.  
\textsuperscript{355} Dawidson, 2005, p.620.  
\textsuperscript{357} Ioras & Abrudan, 2006, p.362.  
\textsuperscript{358} Abrudan, 2012.  
\textsuperscript{359} Abrudan, 2012, p.276.  
\textsuperscript{360} Luca, 2010, p.297.  
\textsuperscript{361} Ioras & Abrudan, 2006, p.362.  
\textsuperscript{362} Luca, 2010, p.298.
and 1/2000, and speeded up the trials that were related to land property restitution. By the end of 2009, about seventy-seven per cent of the ownership titles were issued, corresponding to eighty-five per cent of the land area that had to be restituted.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I: Decollectivisation of holdings between 1 – 10 ha.</td>
<td>1991 – 1997</td>
<td>In 1991 Land Law 18/1991 was implemented which liquidated collective farms and returned land between 0.5 ha and 10 ha.</td>
</tr>
<tr>
<td>Phase II: Decollectivisation of holdings between 10 – 30 ha.</td>
<td>1997 – 2000</td>
<td>In 1997 Land Law 169/1997 accepted land ownership right reconstitution claims for the difference between 10 ha and 30 ha per family.</td>
</tr>
<tr>
<td>Phase III: Decollectivisation of holdings between 10 – 50 ha and forest up to 10 ha.</td>
<td>2000 – 2005</td>
<td>In 2000 Land Law 1/2000 was enacted concerning the restititution of agricultural and forest land between 10 ha and 50 ha agricultural land, and up to 10 ha forest land.</td>
</tr>
<tr>
<td>Phase IV: Decollectivisation of all other holdings.</td>
<td>2005 - present</td>
<td>In 2005 Land Law 247/2005 was implemented as the last restitution step, restituting all other holdings that were privately owned before communism.</td>
</tr>
</tbody>
</table>

Table 5.4 The four phases of decollectivisation between 1991 and present, according to four different land laws.

Figure 5-1 Indication of the influence of decollectivisation on landscape, according to the four phases of decollectivisation. The first two land reform laws (phase I and II) had more effect on the restitution and therefore on the landscape than the third and fourth land reform laws (phase III and IV).

After more than two decades of transition, Romanian agriculture is characterized by four types of agricultural holdings representing different organizational forms. First of all, there are the individual or household farms of less than 2.5 hectares in average size. Together they hold nearly seventy per cent of Romanian land (up from fifteen per cent in 1989). Second, the private corporate farms are legal entities that have emerged from former collective farms, and therefore emerged since 1991. They account for around ten per cent of Romania’s agricultural land (down from sixty-seven per cent in 1989). Thirdly, there are the family or informal associations that are “spontaneously created voluntary associations of individual farmers that are not registered as legal entities.” Their average size is about 120 hectares and they account for a total of five per cent of the total agricultural

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land. Fourth are the state-controlled agricultural companies, the successors of the former state farms. They account for fifteen per cent of the land, but not all is under active cultivation.

The progress of land privatization in Romania is illustrated in Figure 5-2 below, showing the pattern of private land ownership at the end of the collectivization campaign in 1969, in the early stages of land privatization in 1994, and after the last phase of land privatization in 2000. It shows that the areas in Northern Romania and Southern Romania were privatized rapidly fast, in contrast to Western Romania, where the process went quite slow. This is mainly due to the weakness of the collective farms in these hilly areas. The private land ownership displayed in these maps is summarized in Table 5.5 across seven geographical zones.

**Figure 5-2** Agricultural private farming in 1969, 1994 and 2000 by the amount of privately owned land in percentage. Dark indicates a high percentage of privately owned land, lighter indicates lower percentages of privately owned land. Source: Dawidson, 2005, pp.622.

<table>
<thead>
<tr>
<th>Zone</th>
<th>1969</th>
<th>1994</th>
<th>2000</th>
<th>Topography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>8.7%</td>
<td>78.2%</td>
<td>98.3%</td>
<td>Mountains</td>
</tr>
<tr>
<td>South</td>
<td>11.0%</td>
<td>71.5%</td>
<td>94.9%</td>
<td>Plains</td>
</tr>
<tr>
<td>Southeast</td>
<td>3.8%</td>
<td>63.7%</td>
<td>93.0%</td>
<td>Plains, hills</td>
</tr>
<tr>
<td>Center</td>
<td>12.3%</td>
<td>66.0%</td>
<td>98.0%</td>
<td>Mountains, hills</td>
</tr>
<tr>
<td>Northwest</td>
<td>14.3%</td>
<td>71.5%</td>
<td>97.5%</td>
<td>Mountains, hills</td>
</tr>
<tr>
<td>Southwest</td>
<td>13.4%</td>
<td>80.2%</td>
<td>96.7%</td>
<td>Plains, hills</td>
</tr>
<tr>
<td>West</td>
<td>19.3%</td>
<td>63.0%</td>
<td>89.4%</td>
<td>Plains, hills</td>
</tr>
</tbody>
</table>


### 5.4. Decollectivisation and the Romanian landscape

The below described relationships between decollectivisation and landscape changes are shown in Figure 5-3 below. Decollectivisation as a primary process has several constituent processes, which might be for example political or economic. This is related to the different characteristics of decollectivisation as driving force, as identified in the study of Bürgi et al. on driving forces of landscape change. The figure presented below shows the primary (decollectivisation) and secondary driving forces (constituent processes of decollectivisation) of landscape change. These processes caused changes in the landscape. All landscape changes are linked to the landscape indicators in the figure.

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372 Bürgi et al., 2004, p.859
Decollectivisation as a driving force of landscape change

Figure 5-3 The relationship between decollectivisation and landscape changes graphically displayed.

**Shifting land ownership**

First of all, the most important effect of decollectivisation is the shift in land ownership. As a result of the application of Law 18 and Law 1/2000 and the related Laws, the character of landownership in Romania completely changed.\(^{373}\) One of the main problems concerning the land restitution is that many individuals did not know the exact location of the land they owned before collectivization, because cadastral evidence was missing.\(^{374}\) Yet for restitution, the exact location of land had to be established. This especially led to problems when some members wanted to leave the association to farm it on an individual basis or to sell it.\(^{375}\) The restitution process was arranged on a local scale, and the land assigned to individuals was mainly based on records from the city halls. However, as cadastral evidence was missing, this was mainly based on property documents and field measurements and visual identification by the former land owners and neighbors.\(^{376}\) When there was no conflict between the owners, descendants, neighbors and officials, the restitution process went very fast, about two to three years. However, when there were problems concerning the land restitution, the process could be very slow, up till present time. By 2009, about 77% of the ownership titles were issued, corresponding to 85% of the land area that had to be issued.\(^{377}\)

Besides this, the ownership shifts on the landscape led to a diversification of land uses. Nitja: “Romanians understood the privatization a bit strangely, somehow by the logic ‘now this is my land, and I can’t do what I want with it, and I don’t need no one from an association telling me what I should grow on it or when to do it’. When they realized this isn’t the right approach it was a little too late.”\(^{378}\) These consequences are related to the landscape indicator ‘land ownership’.

**Abandonment of agricultural land**

Second of all, decollectivisation led to a restructuring in agriculture, which thereafter caused widespread transformations in land use systems. This paragraph will discuss the constituent

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\(^{373}\) Rusu et al., 2002, p.3.

\(^{374}\) Rusu et al., 2002, p.10.

\(^{375}\) Luca, 2010, pp.293-304.

\(^{376}\) Cosor, personal communication, June 4, 2014.


\(^{378}\) Nitja, personal communication, April 25, 2014.
processes of decollectivisation and the effects of these processes on the Romanian landscape. Loss of traditional landscapes due to decollectivisation is closely related to the abandonment of agricultural land, rural depopulation and extensification of agriculture. However, unfavorable topography had a high influence on the abandonment issue, as land was more often abandoned in the mountainous region of Romania, than in the plains. Due to the legal and administrative reorganization, buildings were abandoned due to investment and innovation in the last two decades.

Land abandonment also occurred in post-communist Romania as many landowners withdrew completely from farming after the fall of communism. This is related to the disappearance of big farms, especially animal farms. Land abandonment was also pushed by the migration of the young population from the west of the country to the major cities. These two abandonment-related factors also led to the disappearance of different types of crops such as orchards and vineyards, and areas of intensive agriculture have been converted to grassland and forest. The land abandonment-trend is related to the landscape indicator ‘land use’, and the relationships between decollectivisation and these landscape changes is reflected in Figure 5-3.

**Land fragmentation**

Third of all, decollectivisation emerged as the appearance of small properties, whereby the splitting of large, previously economically efficient parcels into numerous small private property owned plots, caused the physical fragmentation of arable land. This so called land fragmentation is generally considered as one of the major obstacles for technological and economic progress in Romanian agriculture. It is also seen as having a negative effect on irrigation systems, soil erosion, drainage, tillage and production costs. Through time, Romanian land always has been characterized by small parcels of land, as for example in 1948, rural household with less than 1 hectare represented 36 per cent of the total land area. By 1998, this had increased until 45 per cent of the total land area. Around that time, individual farms had an average size of 2.3 hectares. The land area of each household was divided into four to five parcels, which contributed to even greater land fragmentation, and the plots of agricultural lands were laid out in straight lines, as a consequence of the collectivization by cooperatives. After splitting the parcels due to decollectivisation they became rectangular. In several cases the parcels are very narrow (e.g. 3 m wide and 1 km long). The average width is 25 m, while the average length is 1 km. Land fragmentation is a consequence of decollectivisation that is related to the indicators ‘parcellation pattern’ and to a lesser extent ‘field boundaries’.

**Degradation of irrigation and drainage systems and the decay of infrastructure**

Fourth of all, degradation of irrigation and drainage systems and the decay of infrastructure occurred. Water control systems have not been maintained, as central planning was eliminated, and former cooperative farmland reorganized. The absence of central coordination meant that various components of the irrigation, drainage, and road systems became the property and responsibility of different companies, organizations, associations and individuals. During communism, the national

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379 Sikor, 2003, p.278.
380 Müllner et al., 2009, p.109
381 Born, personal communication, March 28, 2014
382 Václavík & Rogan. 2009, pp.55-56.
383 Ioja, personal communication, April 25, 2014.
384 Ioja, personal communication, April 25, 2014.
386 Dijk, van, 2007, pp.505-506.
390 Rusu et al., 2002, p.11.
391 Rusu et al., 2002, p.4.
government was responsible for the maintenance of all the roads. After, the responsibility of maintaining the roads was divided between the Ministry of Transport (national roads/highways), County institutions (county roads), the Forestry Institution for the forestry roads, and the Municipalities concerned for the local roads. The agricultural roads were the responsibility of the land owner.\textsuperscript{393} Directly after communism this resulted in a decline of quality, as no single party or institution took up the organization and planning of the irrigation systems.\textsuperscript{394} Besides the lack of central coordination, the high costs for maintaining and using the infrastructure and water systems could not be sustained by the individual owners, and the systems decayed. However, after entering the European Union (2007), and being able to apply for funds, an increase in quality has been observed.\textsuperscript{395} These consequences are related to the landscape indicators ‘infrastructure’ and ‘water system’.

\textbf{5.5. Decollectivisation and the landscapes of Râteşti and Stâncuţa}

A study of Müller and Kuemmerle in Argeş County, Romania, showed that after the fall of communism in 1989, cropland decreased with twenty-one per cent from 1990 – 2005. For their study, which also includes Râteşti municipality, they state that vast areas of cropland were abandoned in this period, and are also partly regrowth with shrubs and forests. This abandonment was caused by the low agricultural yields in the marginalized areas and the outmigration of population to the cities. The study shows that cropland abandonment has widespread, location specific effects on ecosystem services, including carbon storage, soil stability, and water quality, and impinges on biodiversity.\textsuperscript{396} Cropland abandonment threatens traditional cultural landscapes\textsuperscript{397} and

\textsuperscript{393} Iojă, personal communication, April 25, 2014.
\textsuperscript{394} Fraser & Stringer, 2009, p.50.
\textsuperscript{395} Iojă, personal communication, April 25, 2014.
\textsuperscript{396} Müller & Kuemmerle, 2009, p.221.
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Their biodiversity. To quote Müller and Kueblerle: “Most abandonment occurred at the start of the transition from the communist command to a market-oriented economy. Overall, cropland became more stable between 1995 and 2005, but there were still high abandonment rates in some areas. Hilly areas experienced the highest absolute decrease in cropland during the post-socialist period.” However, land abandonment in Râțești has not been identified to the same rate as in the whole Argeș County. In Râțești, post-communist break-down of agricultural structures caused conversion of only a hundred hectares of arable land into grazing land and land abandonment, and also in Stâncuța land abandonment rates are very low. This is due to better natural conditions and an easier market access, which benefited the development of profitable farming. In Râțești, the ownership transfer of 600 ha of pastures (former collective agricultural land) to local municipality lead to present disuse and abandonment of the fields.

In both municipalities decollectivisation caused the breakup of large crop farms and animal husbandries into small (10-15ha) and very small (1-3ha) private farms. This influenced the parcellation pattern, and land fragmentation emerged. By 2005, a further increase in fragmentation of agricultural land took place. However, during the last five years, land consolidation took place, especially due to investments of Western European firms.

Maps for Stâncuța show that the parcellation pattern became slightly more fragmented as a result of decollectivisation. The increase in private property, resulted in a decrease parcel size. However, within the municipality of Stâncuța there are differences. In the area directly adjacent to the Danube river, large fields with rice cultivation can be found. Fields near the villages in the West are smaller, and use crop rotation schemes. In the western part of the municipality, the fragmentation led to a diversification of the parcellation pattern and landscape, as the farmers were free to cultivate whatever they chose.

Both in Râțești and Stâncuța, the degradation of water systems is observed as in the rest of Romania. However, there seems to be a stronger decay observed in Râțești than in Stâncuța. The main reason for this seems to be the large Italian investor which maintained the rice field cultivations and therefore also the water system accompanying this in Stâncuța. The quality of the roads in Râțești and Stâncuța depends strongly on the actors responsible. In Râțești, after the fall of communism, infrastructure did not improve too much as a result of centrally planned large scale agriculture. The poor infrastructure in combination with the general economic situation in Râțești postponed urban development. The past couple of years the infrastructure has improved, also because the development of a few residential and recreational projects in the municipality.

399 Müller & Kueblerle, 2009, p.221.
400 Sluis, van der, et al., 2013, p.28.
401 Kristensen, 2011, pp.31-35
402 Kueblerle et al., 2009.
403 Kristensen, 2011, pp.31-35
404 Kristensen, 2011, pp.31-35
<table>
<thead>
<tr>
<th>Year</th>
<th>Developments in Răteşti</th>
<th>Developments in Stâncuţa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>Expropriation of land by the Agrarian Reform Law: 66% of landowners’ property.</td>
<td></td>
</tr>
<tr>
<td>1945</td>
<td>Agrarian reform: Seizure of land holdings larger than 50ha.</td>
<td></td>
</tr>
<tr>
<td>1947</td>
<td>Start of communist period. Socialist Republic Romania.</td>
<td></td>
</tr>
<tr>
<td>1948</td>
<td>All forests became state owned.</td>
<td></td>
</tr>
<tr>
<td>1949</td>
<td>Initiation of socialist agriculture: Confiscation of all estates around 50ha.</td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>Investments in infrastructure and water system started.</td>
<td>Drainage of the wetland are west of the Danube river; Dyke along the Danube river was built; Conversion of the drained area into agricultural land.</td>
</tr>
<tr>
<td>1953</td>
<td>Collectivization of fields; Homogenization of agriculture; Increasing intensification of agriculture.</td>
<td></td>
</tr>
<tr>
<td>1953 - 1969</td>
<td>Most radical changes in landscape due to the collectivization process: small scale landscape elements disappeared; Large scale fields emerged; Investments were made in infrastructure and water systems; Increase in quality and quantity of infrastructures and water systems.</td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td></td>
<td>Large rice plantations of approximately 7000 ha emerged; Founding of an extensive irrigation system to support the rice production; A large wetland area was drained and reclaimed for agriculture.</td>
</tr>
<tr>
<td>1962 - 1969</td>
<td>Reducing of plots for private use of cooperative farm members from 0.3 ha to 0.15 ha.</td>
<td></td>
</tr>
<tr>
<td>1962 - 1989</td>
<td>Period of centrally-planned agriculture; State farms – collective farms – a very small private sector.</td>
<td></td>
</tr>
<tr>
<td>1965</td>
<td></td>
<td>Installation of a hydro-technical pomp permitting the irrigation of 1000 hectares.</td>
</tr>
<tr>
<td>1968</td>
<td>Upgrading of 38 villages to town status; Creation of 53 supplementary towns; Followed by a depopulation of rural areas.</td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>Fall of communism; Transition from command to free-market-oriented economy; State support for agriculture disappeared; New land management policies; Land ownership transfers.</td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>Land Law 18 emerged; Collective farms were liquidated and the land returned to the previous owners; Owners could not receive less than 0.5 ha and more than 10 ha.</td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>Breakup of large farms into small (10-15 ha) and very small (1-3 ha) private farms.</td>
<td></td>
</tr>
<tr>
<td>1980 – 1997</td>
<td>Arable land increased with 0.6%; Pasture decreased with 2.5%; Forest increased with 0.4%; Orchards decreased with 0.4%; Natural vegetation decreased with 0.2%.</td>
<td>Arable land increased with 0.8%; Pasture decreased with 1%; Forest increased with 0.5%; Natural vegetation and vineyards decreased with 0.4%.</td>
</tr>
<tr>
<td>Year Range</td>
<td>Events</td>
<td>Landscape Changes</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1991 – 1994</td>
<td>Conversion from arable land to pasture.</td>
<td>Degradation of irrigation system as a result of the disappearance of general management.</td>
</tr>
<tr>
<td>1997 – 2003</td>
<td>Arable land decreased with 0.8%; Pasture decreased with 2.2%;</td>
<td>Arable land decreased with 1.7%; Pasture decreased with 0.7%;</td>
</tr>
<tr>
<td></td>
<td>Forest increased with 1%;</td>
<td>Forest increased with 0.3%;</td>
</tr>
<tr>
<td></td>
<td>Built up area grew with 1.5%;</td>
<td>Rivers increased with 2.1%;</td>
</tr>
<tr>
<td></td>
<td>Orchards decreased with 0.4%;</td>
<td>Roads increased with 0.6%;</td>
</tr>
<tr>
<td></td>
<td>Natural vegetation decreased with 0.8%.</td>
<td>Natural vegetation, orchards and vineyards decreased with 0.6% eliminating vineyards and orchards entirely from the landscape.</td>
</tr>
<tr>
<td>2000</td>
<td>Law 1/2000 emerged; Ownership right was constituted with in the limit of 50 ha per owner.</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>600 ha of pasture became into disuse or was converted to arable land.</td>
<td></td>
</tr>
<tr>
<td>2003 – 2013</td>
<td>Arable land decreased with 0.6%; Pasture increased with 0.5%;</td>
<td>Arable land decreased with 2.8%; Pasture increased with 2.6%;</td>
</tr>
<tr>
<td></td>
<td>Forest area remained stable;</td>
<td>Forest area remained stable;</td>
</tr>
<tr>
<td></td>
<td>Orchards and grassland almost entirely disappeared, only 11.8 ha left in 2013.</td>
<td>Built up area increased with 0.2%.</td>
</tr>
<tr>
<td>2004</td>
<td>Privatization process was practically completed.</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>Last corrections in land ownership by Law 247/2005;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Last restitution step.</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>Accession of Romania to the European Union</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Investments of Western European investors in Romanian agriculture.</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Investments of Western European investors caused scaling of the land and land consolidation for large scale agricultural production.</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>Establishment of a mineral extraction holding (gravel pit) of 370 ha on the Argeş river shore.</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>77% of the ownership titles were issued, corresponding to 85% of the land area that had to be restituted.</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.6 Timetable with most important dates and events in Romania and more specifically in Rătești and Stâncuța concerning collectivization, decollectivisation and the landscape changes. The events highlighted in blue are the general political and economic developments, the other developments are the developments and changes in landscape.
### Decollectivisation as a driving force of landscape change

<table>
<thead>
<tr>
<th>Landscape indicators</th>
<th>Case study area</th>
<th>Time</th>
<th>Specification of indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use</td>
<td>Răteşti</td>
<td>1945</td>
<td>Forest decrease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1950</td>
<td>Agriculture increase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1955</td>
<td>Pasture increase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1960</td>
<td>Built-up area slight increase</td>
</tr>
<tr>
<td></td>
<td>Stăncuţa</td>
<td>1945</td>
<td>Forest decrease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1950</td>
<td>Agriculture strong increase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1955</td>
<td>Pasture decrease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1960</td>
<td>Built-up area slight increase</td>
</tr>
<tr>
<td>Parcellation pattern</td>
<td>Răteşti</td>
<td>1945</td>
<td>Up scaling of the land due to the different phases of collectivisation</td>
</tr>
<tr>
<td></td>
<td>Stăncuţa</td>
<td>1945</td>
<td>Parcellation caused by restitution laws</td>
</tr>
<tr>
<td>Field</td>
<td>Răteşti</td>
<td>1945</td>
<td>decay and disappearance through scaling of the fields</td>
</tr>
<tr>
<td></td>
<td>Stăncuţa</td>
<td>1945</td>
<td>Field boundaries change</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Răteşti</td>
<td>1945</td>
<td>investments during communism</td>
</tr>
<tr>
<td></td>
<td>Stăncuţa</td>
<td>1945</td>
<td>investments during communism</td>
</tr>
<tr>
<td>Water system</td>
<td>Răteşti</td>
<td>1945</td>
<td>investments during communism</td>
</tr>
<tr>
<td></td>
<td>Stăncuţa</td>
<td>1945</td>
<td>investments during communism</td>
</tr>
<tr>
<td>Settlement structure</td>
<td>Răteşti</td>
<td>1945</td>
<td>Construction of state and collective farms</td>
</tr>
<tr>
<td></td>
<td>Stăncuţa</td>
<td>1945</td>
<td>Construction of state and collective farms and blocks of houses in the village centres</td>
</tr>
<tr>
<td>Land ownership</td>
<td>1945 - 1959</td>
<td>Phase I: Collectivisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1949 - 1959</td>
<td>Phase II: Collectivisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1959 - 1962</td>
<td>Phase III: Collectivisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>Fall of communism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1991 - 1998</td>
<td>Phase I: Decollectivisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1997 - 2000</td>
<td>Phase II: Decollectivisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000 - 2005</td>
<td>Phase III: Decollectivisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2005 - 2013</td>
<td>Phase IV: Decollectivisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2007 - EU access</td>
<td>2007-2013</td>
<td></td>
</tr>
</tbody>
</table>

**COMMUNISM**

**POST-COMMUNISM**
5.6. Comparing the constituent processes of decollectivisation and the effects of the processes on landscape in Răteşti, Stâncuţa and other Eastern European cases

The aim of this paragraph is to compare the case study results to each other and to the broader Eastern European context. By comparing several case studies from different Eastern European case studies, the relative importance of broad scale political and socioeconomic drivers such as decollectivisation on landscape change can be assessed. This has been done following the eight landscape indicators (part I of the thesis), and the five main landscape changes observed caused by decollectivisation (part II of the thesis).

Figure 5-5 Main land reform approaches in Central and Eastern European countries. Main difference in land reform approaches is between 1) restitution of land rights to former owners, and 2) distribution of land rights to the rural population. Source: Hartvigsen, 2014, p.334.

After the fall of communism, in most of Eastern European countries, almost immediately laws were implemented that handled the privatization and restitution of agricultural land. Like Land Law 18 in Romania, also other countries adopted laws concerning decollectivisation and the restitution of land to its former owners. However, there are differences observed among countries, and even within

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Decollectivisation as a driving force of landscape change

The shift from a socialistic planning system to a market economy resulted first of all in the breakup of collective and state farms in all Eastern European countries. These changes in land ownership and fragmentation of farm fields are the main changes after 1900 in Eastern Europe. The main difference in land reform approaches lies between 1) the restitution of land rights to former land owners such as in Romania, Latvia and Bulgaria and 2) the distribution of land rights to the rural population such as in Albania and Ukraine. This division of land reform is based on historical background, land ownership situation at the time of collectivization and ethnicity.

In Eastern European countries, the restitution of collective farmland to former owners and the sale of state farmland were the most common forms of land privatization. Ideally, former owners were restituted their pre-communist land in historical boundaries, or they received property rights from plots with comparable size and quality. The decollectivisation process has some differences amongst the countries. For example in Albania, where land was distributed equally on a per capita basis, in contrast to Romania, where land was distributed to the former land owners, and where part of the collective land was allocated to member-workers. This led to a fragmented land ownership, which contrasting to this, did not always lead to a fragmented land cultivation due to land leases. In general, Hartvigsen identified six land reform approaches from which four apply to the restitution process, and two apply to the distribution process. The approaches can be related to each other and also applied in combination with each other. The approaches are:

1) Land reform approaches related to restitution:
- Restitution to former owners (including allocation of other land when restitution in the old boundaries is not possible);
- withdrawal of formally private land from collective farms;
- compensation (in state vouchers, bonds or money);
- privatization through sale of state land.

2) Land reform approaches related to distribution:
- Distribution in physical parcels;
- distribution in land shares.

In the most common restitution procedure citizens were given a deadline to claim land for restitution and to submit documentation at the local administrative unit. Mostly, this deadline was stated in the early 1990s. Land was restituted in the former boundaries. If this was not possible, the state restituted other state land instead of the lost property. In Romania, land was quite rapidly restituted to individuals, as well as in Albania. But in other countries, such as the Czech Republic, a limited shift to individual farming has been observed, as many agricultural companies and individuals organized themselves in cooperatives. The land was therefore more large scaled in the Czech Republic than in other Eastern European countries: “The large-scale successor organizations of the former state and collective farms still dominate in these countries. In contrast, Albania, Armenia and Latvia have experienced a massive break-up of their collective farms, resulting in a domination of individual farms.” It seems to be that post-communist Eastern Europe is divided into large scale cooperative farms on the one hand, and small scale private farms on the other.

A strong relationship between decollectivisation and landscape in Eastern Europe can be traced back to the parcellation pattern and -size, which differs enormously throughout Eastern

407 Kuemmerle et al., 2006, p.450.
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Europe, as seen in the previous paragraph. Small size holdings in Romania are on the opposite pole of the large scale holdings in the Czech Republic. These changes are due to the different policies applied in the agriculture transition to market economy, and also due to the different decollectivisation policies. For example, in Latvia the land was restituted to citizens, including those living in cities and abroad, who have been unable to farm the land themselves or make use of it otherwise, leading to large amounts of land abandonment. In contrast to this is for example Albania, where the land was only restituted to farmers and former land owners, leading to a relatively low abandonment rate. The results of these different processes on land use and parcel size are reflected in Table 5.8, where the share of arable land, and the average size of agricultural holdings is reflected for communist and post-communist times, in four different ownership categories (collective/cooperative farms; state farms; new cooperative farms; individual farms).

<table>
<thead>
<tr>
<th>Country</th>
<th>Collective/cooperative farms</th>
<th>State farms</th>
<th>New cooperative farms</th>
<th>Individual farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of arable land (%)</td>
<td>74</td>
<td>22</td>
<td>20</td>
<td>n/a</td>
</tr>
<tr>
<td>Albania</td>
<td>58</td>
<td>42</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>61</td>
<td>43</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Hungary</td>
<td>80</td>
<td>28</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Romania</td>
<td>59</td>
<td>12</td>
<td>29</td>
<td>21</td>
</tr>
<tr>
<td>Slovakia</td>
<td>69</td>
<td>60</td>
<td>26</td>
<td>15</td>
</tr>
</tbody>
</table>

| Average size (ha) | Albania | 1,053 | n/a | 1,588 | n/a | n/a | 0.1 | 1.4 |
|                  | Bulgaria | 4,000 | 637 | 1,615 | 735 | n/a | 0.4 | 1.4 |
| Czech Republic   | 2,578 | 1,447 | 9,443 | 521 | 690 | 5.0 | 2.7 |
| Hungary          | 4,179 | 833 | 7,138 | 7,779 | 204 | 0.3 | 3.0 |
| Romania          | 2,374 | 451 | 5,001 | 3,657 | n/a | 0.5 | 2.7 |
| Slovakia         | 2,667 | 1,509 | 5,186 | 3,056 | 1,191 | 0.3 | 707 |


5.7. Conclusion

Romanian agriculture has undergone major changes in the transition from a planned to a market economy starting 1989. The land reform aiming at the redefinition of private land property rights was launched in 1991 with Law 18/1991. Within this Law, that was later on supplemented by Law 1/2000, the restitution of agricultural land to its former owners was organized. The restitution process was for the most part completed by 2004. There are five general constituent processes of decollectivisation observed. These five changes are 1) land abandonment, 2) land fragmentation, 3) degradation of irrigation and drainage systems, 4) decay of infrastructure, and 5) shifting land ownership. They correspond with some of the eight landscape indicators, namely land use, parcelation pattern, infrastructure, water system and land ownership. The two indicators not significantly affected by decollectivisation were field boundaries and settlement structure, because

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418 Müller & Sikor, 2006, p.189.
field boundaries seem to have already largely disappeared during the scaling in the communist era, and settlements increased nor decreased significantly in post-communist times.

The five constituent processes of decollectivisation show distinct correlations with several of the landscape indicators, namely land use, parcellation pattern, infrastructure, water system and land ownership. Field boundaries and the settlement structure have not been significantly affected by decollectivisation. The reason for this is that field boundaries already largely disappeared during the up scaling in the communist era, and settlements increased nor decreased significantly in post-communist times.

The general trends have also been identified in Răteşti and Stăncuţa. Most abandonment occurred at the start of the transition, as in Răteşti for example a conversion took place from arable land into grazing land and land abandonment. In Stăncuţa, the trends concerning land abandonment do not seem to be severe. Moreover, a trend has been observed in the last couple of years, where abandoned rice fields are cultivated again. The analysis has shown that in both Răteşti and Stăncuţa, the trends concerning land abandonment have not been significant. Concerning land fragmentation, the results show that in both areas, this phenomenon took place, as the parcellation pattern changed in post-communist times. However, during the last five years, land consolidation and scaling took place, due to investments of Western European firms and the European Union funding since 2007. The biggest difference between Răteşti and Stăncuţa is the clear division in Stăncuţa’s landscape between the eastern part (large scale rice cultivation) and the western part (small scale private plots). The landscape in Răteşti is more uniform.

One of the more significant findings to emerge from this study is the influence of decollectivisation on the infrastructure and water systems. Study shows that in both areas, the respectively drainage- and irrigation systems were degraded after the fall of communism. However, there seems to be a stronger decay observed in Răteşti than in Stăncuţa. The main reason for this seems to be the large Italian investor which maintained the rice field cultivations and therefore also the water system accompanying this. Another significant finding is the shift in land ownership, that emerged in whole Romania, and also in Răteşti and Stăncuţa. In both areas, the trends were the same: Land was restituted, resulting in ownership shifts and emerging a large amount of private- and corporate-owned farms.

Some nuances are necessary when it comes to the influence of decollectivisation in different Eastern European case studies. Large farm structures and their associated man-made large scale landscapes have remained intact in some regions after decollectivisation, although in other, decollectivisation caused small scale landscapes and the changes emerged during communism seem to be reverted. The primary thought is that decollectivisation fragmented the landscape, but in some areas it was only the management systems that are changed, and not the physical landscapes or parcellation patterns.\textsuperscript{420}

\textsuperscript{420} Blacksell, 2010, p.21.
<table>
<thead>
<tr>
<th>Year</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>Expropriation of land by the Agrarian Reform Law: 66% of landowners’ property.</td>
</tr>
<tr>
<td>1945</td>
<td>Agrarian reform: Seizure of land holdings larger than 50ha.</td>
</tr>
<tr>
<td>1948</td>
<td>All forests became state owned.</td>
</tr>
<tr>
<td>1949</td>
<td>Initiation of socialist agriculture: Confiscation of all estates around 50ha.</td>
</tr>
<tr>
<td>1962-1989</td>
<td>Period of centrally-planned agriculture;</td>
</tr>
<tr>
<td></td>
<td>State farms – collective farms – very small private sector.</td>
</tr>
<tr>
<td>1989</td>
<td>Fall of communism;</td>
</tr>
<tr>
<td></td>
<td>Transition from command to free-market-oriented economy;</td>
</tr>
<tr>
<td></td>
<td>State support agriculture disappeared;</td>
</tr>
<tr>
<td></td>
<td>New land management policies;</td>
</tr>
<tr>
<td></td>
<td>Land ownership transfers.</td>
</tr>
<tr>
<td>1991</td>
<td>Land Law 18 emerged;</td>
</tr>
<tr>
<td></td>
<td>Collective farms were liquidated and the land returned to the previous owners;</td>
</tr>
<tr>
<td></td>
<td>Owners could not receive less than 0.5 ha and more than 10 ha.</td>
</tr>
<tr>
<td>2000</td>
<td>Law 1/2000 emerged;</td>
</tr>
<tr>
<td></td>
<td>Ownership right was reconstituted within the limit of 50 ha per owner.</td>
</tr>
<tr>
<td>2004</td>
<td>Privatization process was practically completed.</td>
</tr>
<tr>
<td>2005</td>
<td>Last corrections in land ownership by law 247/2005;</td>
</tr>
<tr>
<td></td>
<td>Last restitution step.</td>
</tr>
<tr>
<td>2007</td>
<td>Accession of Romania to the European Union</td>
</tr>
<tr>
<td>2009</td>
<td>77% of the ownership titles were issued, corresponding to 85% of the land area that had to be reinstated.</td>
</tr>
</tbody>
</table>

*Table 5.9 Timetable with most important dates and events in Romania concerning collectivization and decollectivisation.*
Decollectivisation as a driving force of landscape change
PART III: Synthesis and conclusions
6. Conclusions and recommendations

The aim of this research was to analyze the landscape changes and decollectivisation as underlying driving force in two case study areas in South-Eastern Romania in the post-communist period, to compare the findings with other Eastern European countries, and to propose a structured model for case study research on landscape changes and driving forces. The study shows the relationships, differences and similarities amongst the cases Rătești and Stâncuța, also in a broader Eastern European context. Landscape changes in the municipalities Stâncuța and Rătești in South-Eastern Romania in the post-communist period have been characterized based on a set of eight landscape indicators: physical geography, land use, parcellation pattern, field boundaries, infrastructure, water system, settlement system and ownership structures. Processes of landscape change are hard to trace, due to different temporal and spatial scales, as well as the different trajectories of landscape change in different regions, and due to the fragmented and limited data available. Therefore, this study used a series of four maps (1980, 1997, 2003 and 2013), complemented by literature, interviews, statistics and fieldwork in order to study the post-communist landscape changes in Rătești and Stâncuța, South-Eastern Romania.

6.1. Sub-conclusions

Part I: Landscape changes

Changes in ownership structures have been identified as the most significant changes in South-Eastern Romanian post-communist landscapes. Due to privatization and the restitution of land, large scale collective and state farms have been abolished and a strong increase in private farmers emerged. This process has been very different amongst the various former communist countries in Eastern Europe, and also the result of decollectivisation has been different in the countries. For example in Romania, a large private sector emerged, whereas in the Czech Republic, private farmers joined strengths in cooperatives, keeping the large scale landscape intact. It can be discussed that ownership structures relate different to landscape changes as the other landscape indicators. This study has shown that the ownership structures largely influenced the physical representation of the landscape through different processes such as land fragmentation and land abandonment. Therefore, the shifting ownership structures did not directly influenced the physical landscape, but indirectly, through the processes it influenced. This is in contrast to the other seven landscape indicators, who are directly related to the physical landscape.

The changes in ownership structure resulted in changes in the parcellation pattern in post-communist Rătești and Stâncuța. This process also caused the fragmentation of the landscape. However, the identified changes in Rătești and Stâncuța are relatively small compared to the changes in other Eastern European countries. For example in Estonia changes in parcellation pattern caused a high degree of fragmentation, and high rates of land abandonment of up to thirty per cent which has not occurred in Rătești and Stâncuța. Because the land here provides high agricultural yields, in contrast to other - especially mountainous - areas in other Eastern European countries. The parcellation pattern data and results presented in this thesis may not reveal the full extent of changes in parcellation pattern as the digitized 2003 and 2013 maps have only mapped the outer borders of the grouped parcels, leaving the small scale changes in parcellation pattern out of the GIS analysis. However, these changes have been visually analyzed during fieldwork, complemented with findings from agricultural statistics and interviews.

Decollectivisation caused the restitution of land to its former owners, returning the landscape into pre-communist character: small scaled, open landscape, highly fragmented and consisting of a mosaic of patches. In some areas, due to the 2007 European Union accession of Romania, land

422 Bičík, Jeleček & Štěpánek, 2001; Kuemmerle et al., 2006, p.463.
423 Bell et al., 2009, p.443.
consolidation took place and the landscape became more large scaled again. The aging of the rural population and the outmigration of youth to the cities intensified this process as large investors bought or leased the patches from the private farmers to consolidate the land for higher agricultural yields. Both Răteşti and Stâncuţa are highly fragmented, the average property is around one hectare, spread over ten to twenty parcels per land owner. In Stâncuţa the landscape remained large scaled after communism, but parcels in Răteşti are smaller, making the landscape more heterogeneous. The main land use type in both municipalities continued to be agriculture during post-communism. In both areas, parcels decreased in size and are generally long and narrow.

During post-communist times, small scale landscape elements such as tree lines disappeared, but it has to be emphasized that they were never largely present in the landscape. Field boundaries are ‘invisible’ in both Răteşti and Stâncuţa, except for land in the proximity of settlements. This corresponds with the other cases from Eastern Europe, where open, large scale agricultural landscapes are the most common. Orchards and vineyards almost completely disappeared in Răteşti and Stâncuţa. This has been caused by a loss of knowledge and equipment to maintain the orchards and vineyards, which require high maintenance for sustaining them. Also the infrastructure and water system decayed, due to lack of management, and division of responsibilities concerning the maintenance of the systems. This trend has been observed in all Eastern European countries. However, maintenance increased after countries accessed the European Union (2004 and 2007) and EU subsidies became available.

Overall, the trends in Răteşti and Stâncuţa are very similar. The most important differences concern the parcellation pattern, settlement structure and water systems. Land use changes have not been significant, in Răteşti around 11.6% from 1980 – 2013, and in Stâncuţa, 14.3% in total, which is remarkable, considering the long time span of 33 years. The low rate of changes contradicts to some extent with the study of Kuemmerle et al. who found that changes were widespread and severe, especially cropland abandonment with an abandonment rate of 21.1%. However, although this study has been executed in the same county as Răteşti, Argeş, the abandonment is mainly located in the hill areas, and to a lesser extent in the plain areas in which Răteşti is located. They also noted that forest cover and forest fragmentation stayed remarkably stable, despite widespread ownership transfers, which affirms the results from this study.

Part II: Decollectivisation

It has been assumed that severe landscape changes took place after the fall of communism, from 1989 onwards, with the change in land ownership and property structure – a process also referred to as decollectivisation. Decollectivisation has been defined as ‘the breakup of large-scale agricultural production units into individually operated farms’ following the transition from a communist and centrally-planned economy to a free market-oriented economy during the early 1990s. State-support for agriculture disappeared, new land management policies were issued, and land reforms resulted in massive land ownership transfers. Through a series of different land laws, decollectivisation influenced the landscape changes in post-communist Southeastern Romania. Although initially decollectivisation has been identified as one of the most important driving forces of landscape change in post-communist Southeastern Romania, it now needs to be nuanced that the process was not as primary as first assumed, but its constituent processes were the primary processes, under the umbrella of container concept decollectivisation, complemented with other political and socioeconomic driving forces of landscape change.

The most important constituent processes of decollectivisation affecting the Romanian landscape change was the restitution of land to former land owners with the emergence of Land Law 18 in 1991. Land 18 liquidated collective farms and returned the land to the families that had given their holdings during the collectivization period. The owners could not receive less than 0.5 hectares, and more than 10 hectares, regardless of the size of ownership before communism. Later on, Law

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424 Kuemmerle et al., 2009.
425 Kuemmerle et al., 2009.
427 Lerman et al., 2004; Mathijs & Swinnen, 1998.
Conclusions and recommendations

1/2000 was adopted, and ownership right was reconstituted for the differences between the area of 10 ha per family and the area effectively contributed to the cooperative, with a limit of 50 hectares. By 2004, the privatization process was practically completed. As a result of the restitution of land to the pre-communist land owners, the landscape changed. The result of decollectivisation can be categorized into the following changes: 1) physical fragmentation of land parcels due to the splitting of large parcels formerly owned by state co-operatives; 2) land abandonment; 3) decay of water systems such as drainage and irrigation channels; 4) degradation of infrastructure and 5) shifts in ownership.

Changes due to decollectivisation in Răteşti and Stâncuţa were limited. A small proportion of Agricultural land was afforested, or turned into pasture in post-communist times. The processes do not differ too much, although there were some nuances in the developments in Răteşti and Stâncuţa. Most important difference is the Italian investor in Stâncuţa, who kept the landscape large scaled and intensively used in the post-communist times. Therefore, the negative effects of decollectivisation such as land abandonment and land fragmentation have less impact in Stâncuţa than in Răteşti. In Răteşti and Stâncuţa, as well as in the rest of Eastern Europe increased land fragmentation has been observed after the fall of communism due to the different restitution processes.

Besides this, land abandonment occurred almost everywhere in Eastern Europe, in contrast to Răteşti and Stâncuţa. However, land abandonment varied in degrees of intensity over the different Eastern European countries. This can be explained by the different processes of decollectivisation. As in Romania the land was restituted to the pre-communist land owners, land became highly fragmented as farmers first received between 0.5 and 10 ha in 1991 (in 2000 restituted up to 50 ha), divided over ten parcels on average. In other countries, like for example Ukraine, land was proportionally distributed amongst all citizens. This meant that also citizens living abroad or in the cities received their share of land. This led to a high degree in land abandonment.

6.2. Conclusion

Concerning post-communist landscape changes in Răteşti and Stâncuţa, it can be concluded that 1) a continuity in land use has been observed over the last 25 years since the fall of communism in 1989. This continuity can be explained due to the decollectivisation process which restituted the land to the pre-communist owners, who maintained the agricultural character of the landscape; 2) a downscaling in field pattern, causing land fragmentation. This can also be explained due to the decollectivisation process which restituted averagely less than three hectares spread over ten to twenty parcels to former land owners. The results of this study do not support the general land abandonment trends in Eastern Europe; and 3) a decay in the landscape indicators infrastructure, water system, settlement structure and field boundaries. This degradation is mainly caused by the disappearance of general national management after the fall of communism in 1989, but also due to the outmigration of youth and to the lack of money to invest. Since the EU accession, and the EU subsidies that became available for agriculture, the systems have been upgraded again. Also, the (foreign) investors reversed the degrading trend of the systems.

Decollectivisation is the principle process that influences several landscape indicators through constituent processes. These landscape indicators are land use, parcellation pattern, infrastructure, water system and land ownership, and to a lesser extent parcel boundaries. Settlement structure is hardly influenced by decollectivisation. Therefore, although decollectivisation does not directly influence all landscape indicators, indirectly it influences the whole landscape, as the indicators are interconnected, representing the landscape as a whole. However, the study showed that the indicators relate differently to the physical landscape. For example, ownership structures influence the landscape indirectly, whereas parcellation pattern has a more direct relationship to physical landscape changes. Also, an hierarchy can be distinguished amongst the landscape indicators. Field boundaries can be seen as part of the analysis of parcellation pattern, as both are strongly interlinked, and changes in the parcellation pattern directly influence the field boundaries. When describing the landscape changes in Răteşti and Stâncuţa it therefore became clear that land use, parcellation
pattern, infrastructure and water system are more dominant in describing landscape changes than land ownership and parcel boundaries.

6.3. Methodological and theoretical reflection

Availability and use of sources

One of the main limitations of underlying study was the use of primary sources. This limitation emerged from the limited availability of sources, but also due to a language barrier and restricted time to execute the study. This has posed frustrations and concerns, as it challenged the possibility of answering the research questions and executing the research. The limited availability of sources was reflected for example in the archival material that has not yet been catalogued, has been lost, or was only selectively available. Besides that, the archival sources since the fall of communism are mostly too recent to be publicly available. For example the archives in Brăila (Stăncuţa) are only publicly consultable until 1989. After, the archives are closed. A lot of data has not been filed, leaving gaps and limiting the study, and cadaster data is only available after 2000. However, the cadaster data only consists of the registration of transactions; there are no maps. When after 2000, land became more expensive, the cadaster system changed, and location was also registered. This was also necessary in order to apply for European Union subsidies.

Other limitations of archival work are clearly stated by Kligman and Verdery, who found that: “Despite a superficial inclination to think that archives are of unquestioned veracity as repositories of the written word, historians will be the first to acknowledge that nowhere is this case. One has to learn to read them – and how to read documents against one another – in order to squeeze anything of value out of them. We believe that for countries in particular, written sources that might be reliable in other contexts are often of questionable validity – a fact that places them on a footing similar to oral histories, which are also problematic.” Since archival sources of the communist era challenge assumptions regarding their reliability, and because in post-communist era the archives are to a large extent impossible to access, this study does not use archival research in order to answer the research questions, but focuses on the strong parts of the study: a multiple source interpretation in order to vouch for the validity of the study. Literature study was supplemented by primary sources as (historical) map analysis, statistics, fieldwork, and interviews, focusing on gaining new theoretical models for post-communist landscape change studies in Eastern Europe.

Using maps

Studies of landscape change are dependent on the availability of data, as just discussed. There are some examples where a great amount of data was available, such as the study of Schneeberger et al., where they were able to look at eleven periods in time through different maps (1885 – 1997). Unfortunately, the availability of such an extended data source is rare. Frustratingly, most studies have to rely on much smaller data sources, such as for example in the study of Latvia by Bell et al., discussed in Chapter 4. They used a data set of three maps: 1900, 1970 and 2000 in order to study landscape changes in Latvia. Underlying study has been fortunate with the availability of four maps for landscape change study: 1980, 1997, 2003 and 2013. It has to be noted, however, that the 1997 map is mostly based on the 1980 map, and the 2013 map is based on the 2003 map. Nevertheless, the maps do provide basic landscape information, which, in combination with other sources, is valuable for research.

428 Micu, personal communication, October 27, 2013.
429 Micu, personal communication, October 27, 2013.
430 Kligman & Verdery, 2011, p.17.
431 Schneeberger et al., 2007.
432 Bell et al., 2009, pp.425-455.
When using maps for landscape research, it has to be noted that caution is needed when dealing with issues of scale, resolution and interpretation. Maps differ greatly in survey techniques, details, accuracy, production and map content.\textsuperscript{433} For this study, two researchers (Cosor and Snoeijer) have digitized the 1980 topographical map and the 2003 aerial photo, and one researcher (Snoeijer) was committed to the digitalization of the 1997 topographical map and the 2013 map, digitized from field data. One of the main goals for digitizing the different maps, is to create possibilities for comparing the different maps and allowing easier comparison between different time periods. When digitizing, the legend categories were made even, and also the landscape elements that were mapped were made similar in all the maps. By unifying the legend categories in all maps, the differences are outweighed, and digital change analysis became possible. However, digitizing maps can mean a loss of information and human mistakes are possible, making the data less reliable. Despite this limitation, digitizing the maps, and making them compatible, added great value to the study.

While the map analysis cannot provide a holistic image of the landscape as studied through the eight landscape indicators, field visits, interviews, statistics and literature help study the landscape changes. Especially concerning small scale landscape elements such as for example hedgerows, field boundaries, shrubs and trees, maps are limited sources for study. Therefore, the maps are limited regarding their ability to reflect the whole content of a landscape. However, during fieldwork and through photos, interviews and literature, an attempt has been made in order to supplement the limited data from the maps.

Starting this research, the aim was to use all the five maps of the areas available. This would mean an additive 1900-1920 map to the collection of 1980, 1997, 2003 and 2013 maps. However, as the time lapse between 1900-1920 and 1980 would be 60 – 80 years, it has been chosen to leave the 1900 map out of the analysis. The study of Bell \textit{et al.} shows that using a time lapse of 90 years is too big, and was a potential problem for analysis.\textsuperscript{434} Also, the focus of the thesis lies on the post-communist period, with some analysis of the communist times as reference. Therefore the 1900 map would not suit well for this study. These two arguments have led to the reflectance of the 1900 map in digital analysis. The map has therefore also not been digitized, such as the 1980 and 2003 maps. Nevertheless, the 1900 map has served for visual analysis concerning the pre-communist times.

Maps are limited sources as they provide the research with a static “one moment” recording of the landscape.\textsuperscript{435} Some researchers state that it is impossible to study the historical change of landscape by static map representations for discrete time periods, since landscape change is a continuous process.\textsuperscript{436} To avoid a static representation of the landscape, time series of maps are used to study the landscape changes over the last 25 years. These time series are important for long-term landscape monitoring.\textsuperscript{437}

\textbf{Decollectivisation as driving force}

Decollectivisation has been identified as the most important driver of landscape change in post-communist South-Eastern Romania. However, there might be other driving forces influencing the landscapes of the case study areas. They have not been taken into consideration – or only lateral/indirect/sideways – which can be seen as a limitation of this study. However, Bürgi \textit{et al.} emphasized that it is appropriate to limit a study to a subset of driving forces which are thought to be most important for understanding landscape changes of interest.\textsuperscript{438} Besides the influence of other driving forces on landscape change, also the influence of actors and stakeholders play an important role in the changing landscapes. However, in this study the influence of the actors is excluded from study, focusing on the direct influence of decollectivisation on landscape changes. Although already argued in the introduction, and also argued in the study by Bürgi \textit{et al.}, that the direct driving force to landscape change study is possible, it can be seen as a

\textsuperscript{433} Eetvelde, van & Antrop, 2009, pp.901-910.
\textsuperscript{434} Bell \textit{et al.}, 2009, p.452.
\textsuperscript{435} Antrop, 2007.
\textsuperscript{437} Eetvelde, van & Antrop, 2009, pp.906-907.
\textsuperscript{438} Bürgi \textit{et al.}, 2004.
limitation of the study that the actors and stakeholders have not been taken into consideration during this study.

**Land use – landscape research**

In existing landscape research, the focus has been mainly on land use changes, instead of landscape changes in its most holistic approach. From the State of the Art it became clear that landscape changes on all scale levels (Eastern Europe – Romania – case study) is lacking, while in contrast, land use research is extremely popular. However, from this study it became clear that land use changes are not extensive in the post-communist time frame on case study level in South-Eastern Romania. They have not been identified as the most important landscape changes. Therefore it is remarkable that the focus of publications from the last twenty years that is suggesting to study landscape changes, had their emphasis on land use change. It is again a reminder that other landscape indicators are necessary topics for study, and that the focus on land use changes as indicator for landscape change can be misleading.

### 6.4. Recommendations for further research

Landscape changes add new layers to the original cultural landscape, and have a growing impact on the current landscape, as has been seen in this study. New landscapes replace the traditional ones gradually or sometimes abruptly, for example as a consequence of driving forces such as decollectivisation. The risk exists that cultural heritage will get lost, and the landscape will be homogenized. Eastern Europe, and especially South-Eastern Romania has been identified as one of the more vulnerable regions to landscape change, as rapid changes have – and are currently still – influencing the landscape. It is alarming that although these trends are identified throughout the scientific community, still holistic landscape research is lacking, especially in Eastern Europe, as has been seen in the State of the Art. Land use and land cover are studied to a great extent, whereas studies on landscape (changes) in Eastern Europe are lacking. No study has been done on spatial patterns in landscape. Therefore it is recommended that future studies not only consider land use changes when they are referring to landscape research, but follow the approach suggested in this thesis, by studying landscape following the eight indicators as framework. However, the eight indicators under study might vary slightly, as a hierarchy in indicators has been observed, and also since some indicators relate to the landscape in different ways than others.

In general, future landscape indicators research must include not only looking at the maps behind a desk, but actually going into the landscape, studying it by experiencing it, and only claiming to study landscape if they actually do. Gaining insight into the most recent landscape changes can benefit the decisions managers and politicians have to make concerning landscapes, to make sure important cultural heritage does not get lost.

A framework is needed in order to characterize landscape changes in rural Eastern Europe, and in special Southeastern Romania. All major changes can be traced back to one or more of the landscape indicators, although they change in space and time. An analytical framework is both necessary and useful for the investigation of landscape changes through landscape indicators. At a general level, it is possible to list the relevant key indicators which should be included in the model. It can serve as a valuable checklist in the initial phase of a research design and a relevant tool to ensure that important indicators and therefore landscape changes are not left out. However, the level of detail when characterizing, comparing and explaining the landscape changes by indicators has to be high to avoid too general results. Therefore it needs to be recommended that further research chooses a more delimited time frame for studying landscape change through landscape indicators. It is not recommended to delimit the study by selecting only one or several landscape indicators, as this

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439 E.g. Kuemmerle et al., 2009.
440 Kuemmerle et al., 2009, p.2.
counteracts with the reflection that the focus on current landscape studies is already too much on land use change as only landscape change indicator.

The study of Bürgi shows that studying driving forces of landscape changes in all its facets is important in order to provide a holistic picture of the case. However, in this study it has been chosen to focus only on decollectivisation as a driver of landscape change, as this has been identified the most important driver. Although Bürgi also admits in his study that sometimes it is necessary to make choices in the driving forces under study, it is highly recommended to take all the driving forces into consideration when studying landscape changes. For example, as the influence of decollectivisation on the Romanian landscape fades away, since Romania's accession to the European Union in 2007, the effect newly available agricultural policies, funds and subsidies can be examined as driving force of landscape change in Romania.

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Appendices
I. Maps Rătești

Figure 1.1 Land cover and landscape elements in Rătești in 1980.

Figure 1.2 Land cover changes in Rătești between 1980 and 1997. The land cover changes are highlighted in the map, based on the land cover categories.
Figure I.3 Land cover and landscape elements in Răşeni in 1997.

Figure I.4 Land cover changes in Răşeni between 1997 and 2003. The land cover changes are highlighted in the map, based on the land cover categories.
Figure 1.5 Land cover and landscape elements in Răteşti in 2003.

Figure 1.6 Land cover changes in Răteşti between 2003 and 2013. The land cover changes are highlighted in the map, based on the land cover categories.
Figure I.7 Land cover and landscape elements in Rătești in 2013.

Figure I.8 The location of change in Rătești between 1980 and 1997, 1997 and 2003 and 2003 and 2013. From this map only the location of changes is shown, not to which land use category the changes belong.
<table>
<thead>
<tr>
<th>Romanian</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luvisoluri albice planice-pseudogleizate, melanice</td>
<td>Pseudo-glazed luvisol melanice</td>
</tr>
<tr>
<td>Protosoluri aluviale</td>
<td>Alluvial protosols</td>
</tr>
<tr>
<td>Soluri aluviale (inclusiv protosoluri aluviale)</td>
<td>Alluvial soil (including alluvial protosols)</td>
</tr>
<tr>
<td>Soluri brun-roscate luvice tipice</td>
<td>Red-brown soil, typical luvic</td>
</tr>
<tr>
<td>Soluri brun-roscate tipice (inclusiv slab luvic)</td>
<td>Typical red-brown soil (including weak luvic)</td>
</tr>
<tr>
<td>Soluri brune argiloiluviale molice (inclusiv slab luvic)</td>
<td>Brown soil with illuviated clay (including weak luvic)</td>
</tr>
<tr>
<td>Soluri brune argiloiluviale molice-pseudogleizate (inclusiv slab luvic)</td>
<td>Brown soil with illuviated clay, mollic-pseudo-glaced (including weak luvic)</td>
</tr>
<tr>
<td>Soluri brone eu-mezobazice pe depozite fluviatile si fluvio-lacustre recente</td>
<td>Brown soil with fluvial deposits and recent fluvio-lacustrine</td>
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<tr>
<td>Soluri brune luvic pseudogleizate</td>
<td>Brown luvisol soil, pseudo-glaced</td>
</tr>
<tr>
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<td>Brown luvisol soil, pseudo-glaced, melanic</td>
</tr>
<tr>
<td>Soluri brune luvic tipice, melanice (local planice)</td>
<td>Brown soil, typical luvisol, melanice</td>
</tr>
<tr>
<td>Soluri gleice</td>
<td>Gley soil</td>
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</tbody>
</table>

*Table I.1 Soil categories translation from Romanian to English*
II. Maps Stâncuţa

Figure II.9 Land cover and landscape elements in Stâncuţa in 1980.
Figure II.10 Land cover changes in Stâncuța between 1980 and 1997. The land cover changes are highlighted in the map, based on the land cover categories.
Land Cover and Landscape Elements 1997 Stâncuţa

Land Cover Categories

- Arable land
- Pasture
- Forests
- Natural vegetation
- Permanent crops - Orchards
- Vineyards
- Rivers - Channels
- Lakes - Ponds - Reservoirs
- Built up area
- Roads
  - Shrub
  - Tree
- Tree line

*Figure II.11 Land cover and landscape elements in Stâncuţa in 1997.*
Figure II.12 Land cover changes in Stâncuța between 1997 and 2003. The land cover changes are highlighted in the map, based on the land cover categories.
Figure II.13 Land cover and landscape elements in Stâncuţa in 2003.
Figure II.14 Land cover changes in Stâncuţa between 2003 and 2013. The land cover changes are highlighted in the map, based on the land cover categories.
Figure II.15 Land cover and landscape elements in Stâncuţa in 2013.
Figure II.16 The location of change in Stăncuța between 1980 and 1997, 1997 and 2003 and 2003 and 2013. From this map only the location of changes is shown, not to which land use category the changes belong.
<table>
<thead>
<tr>
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<th>English</th>
</tr>
</thead>
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<tr>
<td>Cernoziomuri cambice si cernoziomuri argiloiluviale (in crovuri si padini)</td>
<td>cambic chernozem and illuviated chernozem clay (in plain dales (crovuri, padina))</td>
</tr>
<tr>
<td>Cernoziomuri cambice tipice, pe nisipuri (relief valurit eolian)</td>
<td>Typical cambic chernozem, on sand (wind waved relief)</td>
</tr>
<tr>
<td>Cernoziomuri carbonatice, freatic-umede</td>
<td>Carbonate chernozem, groundwater-wet</td>
</tr>
<tr>
<td>Cernoziomuri gleizate, pe depozite fluviatile si fluvio-lacustre recente</td>
<td>gleyed chernozem on fluvial deposits and recent fluvial lake deposits (lacustre)</td>
</tr>
<tr>
<td>Cernoziomuri salinizate, pe depozite fluviatile si fluvio-lacustre recente</td>
<td>saline chernozem on fluvial deposits and recent fluvial lake deposits (lacustre)</td>
</tr>
<tr>
<td>Cernoziomuri semicarbonatice, freatic-umede</td>
<td>Semicarbonate chernozem, groundwater-wet</td>
</tr>
<tr>
<td>Cernoziomuri tipice, semicarbonatice, pe depozite fluviatile si fluvio-lacustre recente</td>
<td>Typical chernozem, semicambic, on fluvial deposits and recent fluvial lake deposits (lacustre)</td>
</tr>
<tr>
<td>Cernoziomuri vermice, carbonatice</td>
<td>Vermic chernozem, Carbonate</td>
</tr>
<tr>
<td>Cernoziomuri vermice, semicarbonatice</td>
<td>Vermic chernozem, Semicarbonate</td>
</tr>
<tr>
<td>Lacovisti pe depozite fluviatile si fluvio-lacustre recente</td>
<td>Swamp on fluvial deposits and recent fluvial lake deposits (lacustre)</td>
</tr>
<tr>
<td>Lacovisti saraturate, pe depozite fluviatile si fluvio-lacustre recente</td>
<td>Salted swamp, on fluvial deposits and recent fluvial lake deposits (lacustre)</td>
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<tr>
<td>Lacovisti, cu gleizare relict (drenate), pe depozite fluviatile si fluvio-lacustre recente</td>
<td>Swamp, with gleyzation relicita (drained), on fluvial deposits and recent fluvial lake deposits (lacustre)</td>
</tr>
<tr>
<td>Lacuri si balti</td>
<td>Lakes and puddles</td>
</tr>
<tr>
<td>Mlastini</td>
<td>Swamps</td>
</tr>
<tr>
<td>Protosoluri aluviale</td>
<td>Alluvial protosols</td>
</tr>
<tr>
<td>Protosoluri aluviale gleizate</td>
<td>gleyed alluvial protosols</td>
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<tr>
<td>Protosoluri aluviale salinizate</td>
<td>Salted alluvial protosols</td>
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<tr>
<td>Soloneturi tipice si soloneturi lvstice</td>
<td>Typical solonet and luvish solonet</td>
</tr>
<tr>
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Table II.2 Soil categories translated from Romanian to English.
### III. Map database

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<td>o Roads – Railroads</td>
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<td><strong>Land Use and Landscape Elements</strong></td>
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<td><strong>Land use categories</strong></td>
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<td>o Natural vegetation</td>
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<tr>
<td></td>
<td>o Shrub</td>
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### Original Map

#### Land Use

*Land use categories:*
- Arable land
- Pasture
- Forests
- Natural vegetation
- Permanent crops – Orchards
- Rivers – Channels
- Lakes – Ponds – Reservoirs
- Built up area
- Roads – Railroads

**Original Map**

<table>
<thead>
<tr>
<th>Year</th>
<th>Land Use and Landscape Elements</th>
<th>Scale</th>
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<td>1980</td>
<td><em>Land use categories</em></td>
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<td>Harta topografică a României, ediția II, Directia Topografica Militara, București, 1977-1985</td>
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<td><em>Landscape elements:</em></td>
<td>1:25 000</td>
<td>Digitized map source: Cosor, 2013, edits Snoeijer, 2013</td>
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<tr>
<td></td>
<td><em>Original Map</em></td>
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### IV. Statistics and graphs

#### Rătești

<table>
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<tr>
<th>Categories</th>
<th>1980</th>
<th>% of total</th>
<th>% rel. change</th>
<th>1997</th>
<th>% of total</th>
<th>% rel. change</th>
<th>2003</th>
<th>% of total</th>
<th>% rel. change</th>
<th>2013</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arable land</td>
<td>33175</td>
<td>76,39%</td>
<td>0,59%</td>
<td>60957</td>
<td>76,98%</td>
<td>-0,78%</td>
<td>60199</td>
<td>76,21%</td>
<td>-0,58%</td>
<td>59742</td>
<td>75,62%</td>
</tr>
<tr>
<td>Forest</td>
<td>18,3</td>
<td>0,23%</td>
<td>-0,01%</td>
<td>17,3</td>
<td>0,22%</td>
<td>0,38%</td>
<td>47,6</td>
<td>0,60%</td>
<td>0,00%</td>
<td>47,5</td>
<td>0,60%</td>
</tr>
<tr>
<td>Cattle</td>
<td>216,6</td>
<td>4,11%</td>
<td>-2,23%</td>
<td>4000</td>
<td>4,11%</td>
<td>-0,58%</td>
<td>47,5</td>
<td>0,60%</td>
<td>0,00%</td>
<td>47,5</td>
<td>0,60%</td>
</tr>
<tr>
<td>Pigs</td>
<td>513,8</td>
<td>10,00%</td>
<td>-0,01%</td>
<td>133</td>
<td>0,00%</td>
<td>0,00%</td>
<td>0,00</td>
<td>0,00%</td>
<td>0,00%</td>
<td>0,00</td>
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</tr>
<tr>
<td>Sheep</td>
<td>2,32</td>
<td>-0,01%</td>
<td>1,51%</td>
<td>210</td>
<td>0,42%</td>
<td>0,42%</td>
<td>210</td>
<td>0,42%</td>
<td>0,42%</td>
<td>210</td>
<td>0,42%</td>
</tr>
<tr>
<td>Vineyards</td>
<td>7908,3</td>
<td>100,00%</td>
<td>0,13%</td>
<td>7918,5</td>
<td>100,00%</td>
<td>-0,11%</td>
<td>7899,6</td>
<td>100,00%</td>
<td>-0,11%</td>
<td>7899,9</td>
<td>100,00%</td>
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#### Livestock

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle</th>
<th>Pigs</th>
<th>Sheep</th>
<th>Poultry</th>
</tr>
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<tbody>
<tr>
<td>1990</td>
<td>4267</td>
<td>7475</td>
<td>2907</td>
<td>12100</td>
</tr>
<tr>
<td>2000</td>
<td>3452</td>
<td>1031</td>
<td>2481</td>
<td>11050</td>
</tr>
<tr>
<td>2005</td>
<td>1887</td>
<td>1750</td>
<td>1795</td>
<td>14000</td>
</tr>
<tr>
<td>2010</td>
<td>1536</td>
<td>3150</td>
<td>2733</td>
<td>32865</td>
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#### Crops

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<tr>
<th>Year</th>
<th>Wheat</th>
<th>Barley</th>
<th>Oatmeal</th>
<th>Corn</th>
<th>Sunflower</th>
<th>Rape</th>
<th>Potatoes</th>
<th>Vegetables</th>
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</thead>
<tbody>
<tr>
<td>2000</td>
<td>1640</td>
<td>2000</td>
<td>1382</td>
<td>1269</td>
<td>60</td>
<td>60</td>
<td>85</td>
<td>156</td>
</tr>
<tr>
<td>2010</td>
<td>1600</td>
<td>1600</td>
<td>1200</td>
<td>1200</td>
<td>160</td>
<td>160</td>
<td>780</td>
<td>195</td>
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#### Table IV.3 Total hectares in land use categories, the size of the category as percentage of total, and the percentage of relative change in percentage point for 1980, 1997, 2003 and 2013 in Rătești.


#### Table IV.5 Crops that are cultivated in Rătești in hectares and the yields in tons for 1990, 1995, 2000, 2005 and 2010.

Figure IV.17 Relative change in land use categories in percentage point between 1980 and 1997 in Rătești.

Figure IV.18 Relative change in land use categories in percentage point between 1997 and 2003 in Rătești.
Figure IV.19: Relative change in land use categories in percentagePOINT between 2003 and 2013 in Rătești.

Figure IV.20: Relative change in land use categories in percentagePOINT between 1980 and 2013 in Rătești.
Figure IV.21: Relative change in land use categories in percentage POINT between 1997 and 2013 in Rătești.

Figure IV.22 Change in percentage of arable land in Rătești for the years 1980, 1997, 2003 and 2013.
Appendices

Figure IV.23 Change in percentage of land cover categories in Răteşti for the years 1980, 1997, 2003 and 2013.

Stăncuţa

<table>
<thead>
<tr>
<th>Year &amp; ha</th>
<th>1980 %of total</th>
<th>%rel.change</th>
<th>1997 %of total</th>
<th>%rel.change</th>
<th>2003 %of total</th>
<th>%rel.change</th>
<th>2013 %of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasture</td>
<td>13376.3</td>
<td>52.09%</td>
<td>-0.83%</td>
<td>13548.7</td>
<td>52.93%</td>
<td>-1.67%</td>
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<tr>
<td>Forest</td>
<td>925.9</td>
<td>3.61%</td>
<td>-0.96%</td>
<td>678.4</td>
<td>2.65%</td>
<td>-0.67%</td>
<td>506.6</td>
</tr>
<tr>
<td>Lakes &amp; ponds</td>
<td>7712.3</td>
<td>30.04%</td>
<td>0.52%</td>
<td>7821.6</td>
<td>30.55%</td>
<td>0.29%</td>
<td>7887.0</td>
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<tr>
<td>Rivers</td>
<td>28.3</td>
<td>0.11%</td>
<td>-0.01%</td>
<td>25.2</td>
<td>0.10%</td>
<td>-0.10%</td>
<td>0</td>
</tr>
<tr>
<td>Built up</td>
<td>2274.2</td>
<td>10.80%</td>
<td>0.03%</td>
<td>2774.2</td>
<td>10.84%</td>
<td>2.11%</td>
<td>3310.1</td>
</tr>
<tr>
<td>Natural vegetation</td>
<td>304.1</td>
<td>1.18%</td>
<td>0.01%</td>
<td>305.1</td>
<td>1.19%</td>
<td>-0.02%</td>
<td>300.8</td>
</tr>
<tr>
<td>Permanent crops - orchards</td>
<td>12.2</td>
<td>0.05%</td>
<td>0.00%</td>
<td>11.7</td>
<td>0.05%</td>
<td>-0.05%</td>
<td>0</td>
</tr>
<tr>
<td>Roads - Railroads</td>
<td>229.4</td>
<td>0.89%</td>
<td>0.00%</td>
<td>229.4</td>
<td>0.90%</td>
<td>0.58%</td>
<td>377.1</td>
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<tr>
<td>Natural vegetation</td>
<td>223.9</td>
<td>0.87%</td>
<td>-0.11%</td>
<td>195.7</td>
<td>0.76%</td>
<td>-0.44%</td>
<td>82.8</td>
</tr>
<tr>
<td>Natural vegetation</td>
<td>90.2</td>
<td>0.35%</td>
<td>-0.31%</td>
<td>9.5</td>
<td>0.04%</td>
<td>-0.04%</td>
<td>0</td>
</tr>
<tr>
<td>25676.8</td>
<td>100.00%</td>
<td>-0.30%</td>
<td>25599.3</td>
<td>100.00%</td>
<td>-0.40%</td>
<td>25573.5</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table IV.7 Total hectares in land use categories, the size of the category as percentage of total, and the percentage of relative change in percentaagePOINT for 1980, 1997, 2003 and 2013 in Stăncuţa.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>5064</td>
<td>1843</td>
<td>1004</td>
<td>1205</td>
<td>1450</td>
</tr>
<tr>
<td>Pigs</td>
<td>9685</td>
<td>3443</td>
<td>1391</td>
<td>3070</td>
<td>2584</td>
</tr>
<tr>
<td>Sheeps</td>
<td>10115</td>
<td>5877</td>
<td>4360</td>
<td>6455</td>
<td>6997</td>
</tr>
<tr>
<td>Poultry</td>
<td>24011</td>
<td>18529</td>
<td>12614</td>
<td>30792</td>
<td>30250</td>
</tr>
</tbody>
</table>

### Table IV.9 Crops that are cultivated in Stăncuța in hectares and the yields in tons for 1990, 1995, 2000, 2005 and 2010.

<table>
<thead>
<tr>
<th>Crops</th>
<th>1990 area (hectares)</th>
<th>1995 area (hectares)</th>
<th>2000 area (hectares)</th>
<th>2005 area (hectares)</th>
<th>2010 area (hectares)</th>
<th>1990 yields (tons)</th>
<th>1995 yields (tons)</th>
<th>2000 yields (tons)</th>
<th>2005 yields (tons)</th>
<th>2010 yields (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>wheat</td>
<td>1830</td>
<td>2000</td>
<td>3061</td>
<td>1040</td>
<td>2950</td>
<td>7026</td>
<td>10415</td>
<td>5633</td>
<td>1158</td>
<td>3207</td>
</tr>
<tr>
<td>barley</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>corn</td>
<td>1061</td>
<td>1606</td>
<td>1493</td>
<td>1420</td>
<td>80</td>
<td>4957</td>
<td>2112</td>
<td>1044</td>
<td>1330</td>
<td>6200</td>
</tr>
<tr>
<td>sunflower</td>
<td>1196</td>
<td>1606</td>
<td>1493</td>
<td>1420</td>
<td>80</td>
<td>1831</td>
<td>1816</td>
<td>918</td>
<td>1330</td>
<td>243</td>
</tr>
<tr>
<td>rape</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>potatoes</td>
<td>460</td>
<td>52</td>
<td>10</td>
<td>52</td>
<td></td>
<td>622</td>
<td>719</td>
<td>5633</td>
<td>480</td>
<td>605</td>
</tr>
<tr>
<td>vegetables</td>
<td>44</td>
<td>52</td>
<td>10</td>
<td>52</td>
<td></td>
<td>596</td>
<td>719</td>
<td>257</td>
<td>*</td>
<td>537</td>
</tr>
<tr>
<td>peas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>80</td>
<td>250</td>
</tr>
<tr>
<td>sugar beet</td>
<td>135</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td></td>
<td>2184</td>
<td>100</td>
<td>257</td>
<td>160</td>
<td>286</td>
</tr>
<tr>
<td>*No data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arable land</strong></td>
<td>0.83%</td>
<td>-1.67%</td>
<td>-2.78%</td>
<td>-4.44%</td>
<td>-3.61%</td>
</tr>
<tr>
<td><strong>Pasture</strong></td>
<td>-0.96%</td>
<td>-0.67%</td>
<td>2.57%</td>
<td>1.90%</td>
<td>0.94%</td>
</tr>
<tr>
<td><strong>Forest</strong></td>
<td>0.52%</td>
<td>0.29%</td>
<td>0.00%</td>
<td>0.28%</td>
<td>0.80%</td>
</tr>
<tr>
<td><strong>Lakes &amp; ponds</strong></td>
<td>-0.01%</td>
<td>-0.10%</td>
<td>0.01%</td>
<td>-0.09%</td>
<td>-0.10%</td>
</tr>
<tr>
<td><strong>Rivers</strong></td>
<td>0.03%</td>
<td>2.11%</td>
<td>0.00%</td>
<td>2.10%</td>
<td>2.14%</td>
</tr>
<tr>
<td><strong>Built up</strong></td>
<td>0.01%</td>
<td>-0.02%</td>
<td>0.20%</td>
<td>0.19%</td>
<td>0.20%</td>
</tr>
<tr>
<td><strong>Permanent crops - orchards</strong></td>
<td>0.00%</td>
<td>-0.05%</td>
<td>0.00%</td>
<td>-0.05%</td>
<td>-0.05%</td>
</tr>
<tr>
<td><strong>Roads - Railroads</strong></td>
<td>0.00%</td>
<td>0.58%</td>
<td>0.00%</td>
<td>0.58%</td>
<td>0.58%</td>
</tr>
<tr>
<td><strong>Natural vegetation</strong></td>
<td>-0.11%</td>
<td>-0.44%</td>
<td>0.00%</td>
<td>-0.44%</td>
<td>-0.55%</td>
</tr>
<tr>
<td><strong>Vineyards</strong></td>
<td>-0.31%</td>
<td>-0.04%</td>
<td>0.00%</td>
<td>-0.04%</td>
<td>-0.35%</td>
</tr>
</tbody>
</table>

Figure IV.24: Relative change in land use categories in percentage POINT between 1980 and 1997 in Stăncuța.
Figure IV.25: Relative change in land use categories in percentage POINT between 1997 and 2003 in Stâncuța.

Figure IV.26: Relative change in land use categories in percentage POINT between 2003 and 2013 in Stâncuța.
**Figure IV.27:** Relative change in land use categories in percentage point between 1980 and 2013 in Stăncuța.

**Figure IV.28:** Relative change in land use categories in percentage point between 1997 and 2013 in Stăncuța.
Figure IV.29 Change in percentage of land cover categories in Stâncuța for the years 1980, 1997, 2003 and 2013.
V. List of Interviewees

<table>
<thead>
<tr>
<th>Name</th>
<th>Date of interview</th>
<th>Institute</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>prof. dr. A. (Angheluta) Vadineanu</td>
<td>August 14, 2013</td>
<td>Department of Systems Ecology and Sustainability University of Bucharest Bucharest, Romania</td>
<td>Professor and head of the Department of Systems Ecology and Sustainability</td>
</tr>
<tr>
<td>dr. G. (Georgia) Cosor MSc</td>
<td>August 2013 – May 2014</td>
<td>Department of Systems Ecology and Sustainability University of Bucharest Bucharest, Romania</td>
<td>Researcher at the Department of Systems Ecology and Sustainability</td>
</tr>
<tr>
<td>Dr. L. (Leo) Paul</td>
<td>September 11, 2013</td>
<td>Faculty of Geosciences University of Utrecht Utrecht, the Netherlands</td>
<td>Associate professor Human Geography and Planning, Methods and Techniques</td>
</tr>
<tr>
<td>prof. dr. D. (Dirk) Strijker</td>
<td>October 3, 2013</td>
<td>Department of Cultural Geography University of Groningen Groningen, the Netherlands</td>
<td>Professor Cultural Geography; Chair holder Mansholt chair for Rural Development; Vice-chair Department of Cultural Geography</td>
</tr>
<tr>
<td>dr. C. (Cornel) Micu</td>
<td>October 27, 2013; June 4, 2014</td>
<td>Faculty of Communication and International Relations Danubius University Galatia, Romania</td>
<td>Assistant professor at the Faculty of Communication and International Relations at Danubius University, Galatia</td>
</tr>
<tr>
<td>Dr. K.M. (Karl Martin) Born</td>
<td>March 28, 2014</td>
<td>Institute of Spatial Analysis and Planning in Areas of Intensive Agriculture University of Vechta Vechta, Germany</td>
<td>Associate professor at the Institute of Spatial Analysis and Planning in Areas of Intensive Agriculture (ISPA)</td>
</tr>
<tr>
<td>prof. dr. C. (Cristian) Iojă</td>
<td>April 25, 2014</td>
<td>Department of Regional Geography and Environment University of Bucharest Bucharest, Romania</td>
<td>Professor in Regional Geography and Environment</td>
</tr>
<tr>
<td>dr. M. (Mihai) Nitja</td>
<td>April 25, 2014</td>
<td>Center for Environmental Research and Impact Studies University of Bucharest Bucharest, Romania</td>
<td>Lecturer at the Center for Environmental Research and Impact Studies</td>
</tr>
<tr>
<td>A. (Alexandru) Gavrildis MSc</td>
<td>April 28, 2014</td>
<td>University of Bucharest Bucharest, Romania</td>
<td>PhD student</td>
</tr>
<tr>
<td>I. (Ionela) Carlinescu MA</td>
<td>May 12, 2014</td>
<td>Oprea Iorgulescu School Campulung, Romania</td>
<td>High school teacher</td>
</tr>
<tr>
<td>dr. D. (Daniel) Müller</td>
<td>May 14, 2014</td>
<td>Department of Structural Change of Farms and Rural Areas Leibniz Institute of Agricultural Development in Transition Economies Halle/Saale, Germany</td>
<td>Deputy Head of the Department of Structural Change of Farms and Rural Areas at the Leibniz Institute of Agricultural Development in Transition Economies (IAMO); visiting scholar Geography Department Humboldt University in Berlin</td>
</tr>
</tbody>
</table>
Landscape changes and the effect of decollectivisation in the municipalities Răteşti and Stăncuţa (South-Eastern Romania) during the post-communist period (1989-now)

M. H. Snoeijer