Anthropogenic Open Land in Boreal Landscapes

Investigations into the Creation and Maintenance of Arable Fields on Swedish Farms

Solbär, Lovisa

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Abstract:

The human-induced open land (cropland, pasture) in the predominantly forested boreal landscapes relies on arable land use; it thus represents an active intervention to hold back forest regrowth. The thesis investigates the practical management decisions by landholders on discrete farms, which in Sweden often comprise both forest and arable lands. The theoretical framework utilizes the concepts timespace, landscape, orientation and commitment to understand how the farmer relates to the land. The study draws on farm cases in various parts of the country, and links land-cover continuity on arable fields and forest clearance with land-use decision-making as a temporally and spatially situated activity. Also when retiring from active land management (due to old age or farm-external income) farmers continue to maintain arable fields, a finding that is interpreted as deriving from the values perceived in the land and the importance of their reinforcement for the landholder identity. Locational fragmentation of managed arable land scattered in the landscape, the increasing of farm sizes following profitability concerns, and a local shortage of land together with other factors induce land clearance on contemporary farms, preferably near the farm centre and contiguous with already managed fields. This finding is understandable when considering time as a resource in farming, and suggests that contemporary boreal landscapes may contain areas that are subjected to an opening-up land-cover dynamics, against the prevailing trend of reforestation.

Key words: Landscape, timespace, time-geography, farming, boreal land use, time-economy, embedded values

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Front cover photo: Land cover under transition (above);
cleared land, the shadows of the farmer and the author (below).

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This project has been made possible by financial support from the Swedish Research Council.[2] A particular thank goes to my respondents, the landholders who have shared their time and the stories of their farms with a stranger for the sake of research and a particular research project. Further, I am indebted to Hans Larsson and Lisbeth Andersson for their support during my preparation for the farm visits, as well as to Lennart Olsson for support in carrying out the study circle with farmers.

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[1] Hägerstrand 1993.

[2] Project code 2007-10458-54158-34.

My research has benefited from the contributions of several persons whose paths have intersected with mine in helpful ways. I would particularly like to express my gratitude to all of you who have read texts and drafts along the way; indeed, I would guess that you were often led into jungles of formulation that made it nearly impossible to perceive the ideas (vistas) those texts sought to convey (describe). You are not mentioned in person – due to concerns of anonymity!? Well, rather due to the risk of omitting somebody. Thank you!

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Thus it is time to finish this book. And send it to my mother who has always been keen on learning what I produced text-wise. This time it took several years, because this one was a big writing project. Now the book is ready! Thank you for all support!

Tiina Lovisa Solbär

Lund, 20 January 2014.

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Introduction

"In the beginning there were the moss, the hoe, - and Jussi". [3]

A cornerstone in Finnish literature, the trilogy Under the North Star by Väinö Linna (1920-1992) portrays the unfolding story of a smallholder family against the backdrop of key events in Finnish history from the late 19th century until the 1950's. The story begins with a farm hand, Jussi, clearing land to make a croft, and the very first sentence of the trilogy is as quoted above. Linna (1974 [1959]:7–16) then goes on to depict Jussi wandering on the nearly treeless moss and pondering on what he sees. Eventually, Jussi happens upon a small stream and sees the possibility to drain the wet from the land via this outflow. At home, he tells his wife everything, and after this he spends all his spare time walking over and across the moss, Linna tells the readers. In the autumn, when his obligations to the landowner are settled, Jussi starts working, first deepening the bed of the stream, then clearing the land. This beginning of the story points at the act of clearing and the open land as bearers of family history and livelihood.

In the context of my research project on the praxis of land-use on farm level the above quotation can be read in several ways. Firstly, a contemporary author would perhaps pick a different way of starting a similar story of Nordic settlement, as clearing new land on organic peat soils is today not viewed positively in either Finland or Sweden (Finnish Ministry of Agriculture and Forestry 2011; Kivimaa *et al* 2012; Lehtonen, pers. comm.; Ståhlberg, pers. comm.), one particular concern being the comparatively high greenhouse gas emission levels connected to the arable use of such soils (Kasimir-Klemedtsson *et al* 1997). Secondly, Linna differentiates between the land, the tool (the practice of doing), and the person Jussi (to whom these are meaningful) – a three-part conceptualisation in line with scholarly models of landscape and land-cover change (e.g. Widgren 2010; Domon & Bouchard 2007; Stephenson 2005), which also indicates that land use essentially entails a farmer–land-cover relationship mediated by technology. Thirdly, the fact that Linna starts with land (i.e. the moss) offers a possibility to explore land use from the perspective of the land, saying thus: In the beginning, there was the land. What I mean here is that this can help us to focus on the constraints put on land use by the fixity and spatiality that characterize land; land use activities are about getting in touch with the land, where it lies, and this necessarily requires mobility. Farming is further about handling values that are perceived in the land. Cleared land by its inclusion in agricultural production comes to 'produce', i.e. bear and represent, the 'open landscape' (cf. Vergunst 2003), which in its land-cover dimension fully relies on arable land use, i.e. on humans interacting, interfering with natural processes (Ihse 2005; Setten 2005; Antonson & Larsson 2011). Otherwise, open land in Nordic boreal landscapes soon reverts to

[3] Linna (1974 [1959]:7, my translation).

"*wildwood*" (Blom 2005; cf. Benjamin *et al* 2005). Farming therefore creates and upholds both the openness of land to make a farming space, and in so doing 'creates the land' in a wider sense:

"The farmers in [the Parish] are perceived as important bearers of culture by other inhabitants in [the Parish] (...) they 'create the land', that is to say they form the agrarian landscape that provides visible evidence for the existence of the local community" (Gunnarsdotter 2005:210, my translation).

Apart from dealing with the fixity of land, farming is about creating stability in an overall dynamic situation governed by crops growing, the weather changing, and farm animals needing in supervision. The idea of farming as an interplay with land in an attempt to stabilize a setting for arable production can provide yet another approach to reading Linna's novel. Other Nordic authors as well as Linna have depicted farmers' life histories against the backdrop of land-clearance and the development of society[4]. The attractiveness of such 'frontier stories' might reflect more than a socio-historical valuing of the past: My reading suggests that these stories suggestively point at the human experience of corporeality as such, what it takes to be embodied, thus to be bound and enabled by a body. Such stories are generically human, describing the vulnerabilities, efforts and persistence involved in creating a liveable place and maintaining its liveability. Today, we are seemingly free from such realities; yet, even in our urban lives, we can come to experience effort and risks, and we are often keen on making things easier and more secure, we look for ways to get things done faster.

The encounter with the materiality of things and the being bodily are present in the doing of everyday things, in cooking, in mobility, leisure time activities, or writing a novel – all things that take effort, that might go wrong, and that have to be done from beginning to end. A simple example of the constraining effect of materiality, and its derivative spatiality, is taking a walking tour: After 5 km of walking, one is not able to jump back home in the next moment; rather, one must *go* all the way 'back', whether or not one still likes it. Therefore, of experience, we know that we benefit from planning the time consumption approximately and take some refreshments with us. Things are in a similar way regarding the spatial practice of farming, which is the topic in this thesis.

It would be rather inaccurate to describe today's farming – on which contemporary agrarian landscapes rest – as a vulnerable human situation, as painfully insecure, while, in fact, it also presents a story of human power as expressed in sophisticated spatial practices focusing on resource extraction. At arm's length, the almost mythical stories from the past portraying the effort and heroic persistence of people engaged in the risky and existential undertaking of creating a place in which to live and make a livelihood, attract us by reminding us of the precariousness of corporeality. My interpretation is that this expresses an important aspect of human life, one for which land use

[4] In 1917, in his novel Growth of the Soil, the Norwegian Knut Hamsun (1859-1952) lets the story unfold from the establishment of a homestead in the untilled 'wild' (Hamsun 2007 [1917]). In Sweden, Linnéa Fjällstedt (1926–) as recently as in 1977 depicts a family history grounded in reclaiming of land in the novel Ödeslotten - a title nearly impossible to translate due to double meanings, saying something like: the desolate plot on Earth that became a destiny (Fjällstedt 1977).

offers a good example – namely, how materiality works in human life.[5]

My study focuses on open arable fields in contemporary boreal landscapes[6], especially their creation and maintenance and the contexts they are part of; I am therefore studying aspects of the processes on which the much-valued open countryside in the Nordic cultural landscape depends. This openness of land relies on recurring land management measures, which hinder forest regrowth. To me, arable fields represent the result of active intervention. When using the term 'processes' I have in mind an evolving totality that includes human activities and the nonhuman. This terminological difficulty expresses the dichotomy of thinking in categories such as nature vs. culture or nature vs. society. As an alternative, attempting to overcome this problematic, Stephenson (2005:178ff.) uses practices in an inclusive manner, detailing: "*'Practices' refers to dynamics in the landscape – both human practices (such as activities, traditions and customs) and natural processes (such as ecological flows and water cycles)*" (Stephenson 2005:188). While this description applies well to how I perceive the farm setting – a stretch of landscape – in the research on the processes present on the farm weight is here on the farmer as situated amidst the evolving totality. To this end, the description of 'process' by Corbin & Strauss (2008) is fitting:

"Process demonstrates an individual's, organisation's, and group's ability to give meaning to and respond to problems and/or shpae the situations that they find themselves to be in through sequences of action/interaction, taking into account their readings of the situations and emotional responses to them." (Corbin & Strauss 2008:98).

Between the farmer and the land there is a dynamic that I attempt to capture in this thesis from the point of view of the situatedness of the farmer.

I place analytical emphasis on the consequences of materiality for land use for the following three reasons. Firstly, by definition, responsibility for the land is carried practically by the farmer. Insights into the practice of farming can represent important steps in advancing towards sustainable land use, and complement approaches that omit an activity perspective (e.g. Carmona *et al* 2010, who utilize national censuses and satellite imagery to study the influence of farming systems on deforestation, agricultural expansion and forest regrowth). In the field of rural sociology, too, the degree of consideration given to farmer agency has been seen as wanting (Boonstra *et al* 2011). Secondly, and mirroring the first point, land use is not so much about the unconstrained imposition of the farmer's plans and visions onto an empty receptive space. Rather I would maintain that farming in its enactment is essentially about

[5] I adhere to Schatzki's (2010b) definition of materiality as "*physicality, composition, bio-physicality, nature, and environment*" (Schatzki 2010b:133). This is a broad definition, which pulls together a range of concepts in the aim of grasping the elusiveness of materiality. To me, it is important that a definition of materiality capture the tangibility expressed by physicality, the compositeness that also indicates the spatial extension of things material, and the life processes which in Schatzki's definition are circumscribed by three terms that appear to be searching in character but are also traditionally used to point in the direction of this life: bio-physicality, nature, and environment.

[6] Boreal means "*belonging to the north*". I adhere to the geographical definition of 'boreal' as "belonging to the north" (Penguin Dictionary of Geography). The dictionary specifies boreal as applying to: 1) the northern coniferous forests; 2) the climatic zone with snowy winters and short summers; (and, in parentesis regarding my study: 3) the climate period from 7500 to 5500 BC). The boreal landscapes show a specific geomorphology influenced by glaciation and characteristic soil-climate interplay. In this study, the Nordic boreal landscape is represented by the selected farms, their sites and surroundings, in different parts of Sweden.

adjusting to material settings and processes, since agricultural activity reaches its goals by interacting with land, crops and farm animals, as well as with the tangible consequences of weather. I suggest that knowledge of how this relational element guides the practice of land use is of importance for policy-making, since the necessities encountered in practical land use are among the factors, which shape the logic of farming.

Thirdly, it is my view that our knowledge of boreal landscape dynamics in terms of land-cover development can be improved by studying farming practice on farms as a 'situated' process. Human-induced land-cover processes appear in the land/climate system as immediate factors, affecting global change. The re-coupling of such land-cover processes to their origin in 'human cultural systems' has to date only been undertaken to a limited extent. This study is therefore about exploring the relationship between farmers and land as an approach to study boreal landscape dynamics.

Aim and Research Questions

This thesis deals with rural land use in contemporary boreal landscapes and aims at proposing interpretations of the farm-based processes that produce specific land-cover dynamics concerning the distribution of forest and arable land. I approach farm-based processes as expressions of the relationship between the farmer and the land and focus specifically on the creation and maintenance of open arable land.

The following research questions have guided my research:

(1) What kind of land-cover dynamics can be identified on farm level?

(2) Which farm-based processes are associated with the land-cover dynamics found?

(3) Which interpretations can be offered to understand the farm-based processes found?

(4) Which landscape effects on the distribution of forest and arable lands in boreal landscapes do such farm-based processes indicate?

Research Approach

The ambition that has guided the study – that of linking land cover and land-use decision-making – stems from a research project on regional climate, ecosystem and land use changes, aimed at producing a coupled Regional Earth System Model (RESM). As a sub-project of the RESM project, my study approaches the human dimension of changes in land cover. The 'regional' reads as the "*boreal, arctic and alpine land areas of northern Europe*" (project description). The inclusion of human decision-making processes in a study linking climate, ecosystem and soil processes exemplifies the fact that the focus in environmental and climate-change research is shifting to land-use decision-making (Karali *et al* 2011; Aspinall & Hill 2008a). The study of decision-making in rural land use is often based on the observation and statistical assessment of farmer attitudes (Willock *et al* 1999; Karali *et al* 2011), or choice behaviour drawing on consumer-choice studies and an assessment of preferences via surveys (e.g. Murray-Rust *et al* 2011). Recent studies on land use change often utilize agent-based modelling (Parker *et al* 2003, 2008; Matthews *et al* 2007). Agent-based modelling represents agents such as farmers according to typologies, and simulates land-cover processes via causal chains of parcel-level choices specific to agent types (Ligtenberg 2006; Edmonds 2006; Doran 2006; Acosta-

Michlik & Espaldon 2008); the result is an emerging (physical) landscape structure arrived at via simulation (Valbuena *et al* 2008, 2010; Gaube *et al* 2009; Murray-Rust *et al* 2011; Berger 2001).

In formulating the goal for my study of the land-cover dynamics in the boreal landscape, I have built on the original research proposal: to research land-use decision-making by focusing on, firstly, the forestry–agriculture transition; and secondly, boreal landscape processes. Karali and colleagues (2011) observe that currently there are many understandings of factors to explain farmers' land-use decision-making. The authors point out the importance of contextualising land-use decisions by "*tak[ing] into account the socio-economic, cultural, political and ecological* milieu *of the individual area*" (Karali *et al* 2011:138, emphasis added). To take this further, Primdahl (1999) argues that keener focus be placed on the farmer as the landowner: "*I argue that the [land] owner is a key person in changes of the structural part of the landscape and should be included in landscape research and also be considered as a key actor by the planning authorities*" (Primdahl 1999:143). My study supports, as will be apparent at the end, the finding by Primdahl (1999) that "*[e]ven when the farmer and the owner are the same person, the `owner' may take very different types of decisions than the `producer' does*" (Primdahl 1999:143). I will however argue that the owner's decisions influence the farmer's decisions, or rather that these aspects be viewed together in the embodied person(s) who act(s) in these functions or roles on their farm. The landowner's role of being a key person arises in my view due to the necessity (not only the priviledge) to engage with land in one way or other. This supports applying a farmer perspective in a study of land use and land cover change, i.e. to seek to understand the farmer's situation in a milieu containing various influences, one of which is the necessity to relate to corporeality and the materiality of things. Land management due to the materiality and fixity of land comes with a specific, to temporal and spatial aspects connected logic as I argue in this study, because farming makes an example of a spatial activity. In addition, previous studies suggested that human activities in general, and land use activities in particular, spring forth from a behavioural logic other than rational choice behaviour (e.g. Setten 2002) – which I take to mean that land use activities are situated, and enabled and constrained by being so. I maintain that observable land-cover dynamics depends on farmers' practical engagement in land-use, and the totality of the on-farm situation affected by the wider 'milieu'.

The methodology originally proposed included a regional case-study to identify "*key agents, decision pathways and driving forces of land use change*" (project description), with the findings to be subsequently inputted into an agent-based model framework (for a closely related example of an agent-based model framework, see Murray-Rust *et al* 2011). I decided to focus on farmers as key agents, and to study land-use practice with the aim of gaining an increased understanding of land-use decision-making as something which, whether or not it is impinged on by regulatory or market influences, is a situated and embodied enterprise in the sense of it being governed by specific conditions that pertain to working the land and, in Setten's (2005) description, being close to the land. Land-use decision-making is intriguing due to the relationality it contains – I argue that farmers' decision-making is relative to land, at the same time as it is also enacted in relation to prevailing farming practices, as discussed by Setten (2002) and Pred (1986). A contextual approach of this kind is additionally motivated by a social-science-based understanding of the indeterminacy of future

human action (cf. Schatzki 2010a:179ff.). From the time-geographic perspective, too, the impossibility of foreseeing future outcomes has been noted, "*particularly at micro-level*" (Lenntorp 1976:15). In addition, Claessens and colleagues (2009) adress the issue of complicated cause and effect relations arising when biophysical aspects and land use are put in one model; human behaviour may change for example under risk, policies or market prices might change in future in ways that cannot be forecasted. Such considerations lead me on an exploratory inquiry at farm level, rather than e.g. a survey study, as it appeared that the knowledges of land-cover processes, farming practice, and farmer decision-making had not previously been brought together from the point of view of land cover change. In my study, I have attempted to abstract locational principles and to interpret the relationship between farmers and land from a formal point of view, for example concerning the creation of values perceived in the open arable land.

The research was initiated as a regional case study, based on farm-level inquiries, in a 'mosaic landscape' containing a mix of arable and forest lands. I then moved on to studying single farms (in various locations) where forest clearance was in progress, as the findings from the farm studies that were keyed towards a regional description appeared to reach 'maturity' long before all the farms in the planned-for area had been covered. The empirical material therefore brings together farm studies from one mosaic landscape with farm studies scattered over other landscapes (detailed in chapter A4, section Empirical material). The farm studies are founded in a combination of observation, contextualisation and interpretation (detailed in chapter A4, section Methodology). I have visited farms to talk to farmers and made observations of the farm lands – especially the open fields. In addition, I have utilized complementary sources of material, a study circle with farmers, interviews with experts (other than the farmers themselves), and various farm-specific documents. As part of the analytical work for this thesis, I have produced farm land and landscape maps (see chapter B7, and Appendix V). The creation of materials followed the principles of what Corbin & Strauss (2008) call 'theoretical sampling', which aims at discovering and substantiating relevant concepts for approaching, describing and interpreting the phenomenon studied.

Below, a short description of the theoretical approach of the study follows. The dependency of the openness of land on active intervention via recurring land management measures to hinder forest regrowth makes it relevant to consider of arable fields as *timespaces*. The notion of *timespace* concentrates a large body of time-geographic work into the description of the unfolding of geographical places (for an overview, see Ellegård & Svedin 2012; Dijst 2009). I derive from time-geography a processual conception of landscapes as places, in which entities take up space, touch and part, moving on individual paths[7] (Hägerstrand 1985, 1993, 2009). Approaching arable land as timespace opens up each piece of cropland or pasture as interplay of entities, gathering in, on, and around the field. Arable fields in this view represent instable socio-material settings, in

[7] 'Path' in the time-geographic sense signifies a concept for analysing the uninterrupted advancing of a corporeal entity along a line, as it were. The words 'path', 'trajectory' and 'life-line' are used by Hägerstrand (1985). In the literature in English 'path' is used frequently, e.g. by Dijst (2009), while Ellegård & Svedin (2012) specify 'the individual path', which puts stress on the fact that each and every material entity has its unique individual location in timespace (for a more detailed discussion of the concept of path, see Pred 1981).

which farming is carried out, and which can be grasped by time-geographic concepts. In this thesis, I follow the becoming and reproduction of arable fields from such a process perspective. I however also apply the notion of *activity timespace* (Schatzki 2010a), which is rooted in the premise that practices are accompanied by specific (experiences of) spatialities and temporalities connected to their enactment. This enables to consider the activity of farming as something that not only occurs as materialized deeds and acts, but is also carried out in relating to the materiality of bodies and things, which is the key to understanding activity as situated, I argue. Both the fixity of things corporeal and tangible as well as their spatiality are factors that a farmer deals with. Finally, in their being timespaces, and human accomplishments, arable fields express human orientations and commitments that are located at the 'background' of the field whence the field 'appears' – in this thinking I am inspired by Ahmed (2006, 2010). Essentially, the *background* as a concept embraces what was termed active intervention above, including the motives for this intervention. Ahmed describes the background as "*that which must take place in order for something to arrive*" (Ahmed 2010:239); and maintains that before something can emerge both spatial and temporal processes must take place (Ahmed 2010:240). In this study, I thus combine time-geographic, practice-theoretical and phenomenological approaches to human activity. These understandings stress human corporeality in relation to the material world, and represent a choice among the literature that enabled me to retain the link between land cover and 'land user', the examination of which is the goal of this study.

Delimitations

In this study, I have excluded an explicit investigation of reforestation. This topic has been covered to some extent previously, at least indirectly (e.g. Nordström-Källström 2002). Agricultural statistics show that the area of arable land under cultivation is decreasing, and that this is due not only to an expansion of urban land use on arable land, but also, it is suspected, due to afforestation or passive forest regrowth (Swedish Board of Agriculture 2011; Statistics Sweden 2008; see also the chapter Rural Boreal Sweden). A study of reforestation requires, according to my judgement, detailed comparison of aerial photographs from different points in time, or some other detailed landscape assessment. This would initially require detective work, as reforestation is often 'passive' and not notified to authorities. This first stage of the study would then have to be combined with farm studies and farmer interviews, although letting a piece of land revert to forest might be a difficult topic to discuss with landholders. It appeared to me to be more rewarding to study the active interventions which provide arable land with continuity or create new arable land (land reclamation) due to the prominence of the picture that the landscape in Sweden is closing-down (e.g. Antonson & Larsson 2011).

Neither does my study investigate differences in farming practice based on social categories such as age, gender or the degree of economic dependency on agriculture (i.e. whether the person in question farms as a hobby, part-time or full-time). The first two categories can obviously matter in land use activities since during the course of daily activities, our embodied presence is central, and those activities are affected physically and socially by age and gender. Old age in particular may restrict

engagement in farming; however, in the cases studied withdrawal from farming, for example, occurs as a result of retirement but also due to the necessity to engage in a non-farming job. This is because farming activities are enabled by economic resources; economic dependencies influence the available time and resources that can be invested in the farm and farming. Currently, the Swedish cadastral authorities allow the formation of farm estates that do not provide their owners with all, or even a significant part, of their livelihood; it is enough that some income can be expected from the farm (see chapter A3). Moreover, I do not explicitly discuss the number of people working on a particular farm in relation to the farming activities carried out there, as my focus is on the farmer's consideration of and encounter with materiality both when planning for management actions and in the practical enactment of farming. Land management remains governed by timespace conditions, irrespective of the number or type of people carrying out land use activities.

This study omits a gender-based analysis as stated. I have excluded gender because, as an analytical construct, it could be said to be 'looking in a different direction' than this study, namely towards the social-platial repercussions of gender, not in the direction of how farming activities are oriented by the materiality of land and the various processes that compose a landscape as timespace. I believe that the approach chosen in this study, with its point of departure in human corporeality conditioned by a material world, has an affinity with strands of research in which the situatedness of humans is a central concern.

That said, I conclude this section with some brief observations on social and gender aspects, especially as in Sweden during the 20th century agriculture was promoted and pursued as family farming (*SOU 2001:38*, see chapter A3). For example, a division of labour may be present on farms such that men work on the land and women with animals (Lidestav, pers. comm.); this seems to be true for those farms covered in my study where both sexes are present on the farm and/or where cattle are kept. This is not always the case: the work with the cattle is done by a man on some of the farms studied, on other farms it is a woman who works on the land. Additionally, when running a larger enterprise and/or during winter, wife and husband share the duties in the cowhouse (as I was told). As far as I have been able to ascertain, previous studies on gender influences on land use activities (including its implications on land cover) do not exist. However gender-based differences might exist in landholders' relationships to land in ways similar to what has been observed in forest owners' relationships to forest management: the activity patterns of forest owners, for example with regard to harvesting activities, have been found to differ in correlation with gender (Lidestav & Ekström 2000). The landholders' relationships with their land might further differ due to cultural influences exerted by regionalized gender contracts (Forsberg 2010). Finally, male and female timespaces in farming might differ, as has been found for other everyday activities (Friberg *et al* 2009). Time-geography has rightly been criticised for disinterest with regard to those people whose lifelines are being followed (Rose 1993; Friberg *et al* 2009). Currently, feminist time-geographies are emerging as powerful tools for unravelling inequalities in gendered everyday milieus: Scholten and colleagues (2012) show the very concrete socio-spatial working of gendered relations, and Forsberg (2010), viewing space and gender as closely interlinked, connects gender and geography via the construction and reproduction of gender relations in everyday practices.

Nevertheless, previous findings concerning farmers' gender and relation to land(scape) (Setten 2003) indicate that farmer identity might come prior to gender identity:

"The farmers' – both female and male – perceptions of nature and landscape are tied to being close to the land through their farming practices. This is due to the fact that farmers' basic knowledge about nature and landscape is gained through a constant engagement with the land through their agricultural practices (…). [i]n general, there is no evidence that being perceived as 'closer to nature', and presumably more 'caring', affects these women's practices in terms of the way they act in relationship to the land they farm" (Setten 2003:141).

Land management remains, as argued above, governed by timespace conditions, irrespective of the gender of the people who carry out land use activities. The meanings that individuals attach to land or the way they articulate these meanings may however differ according to gender as a dividing line. These aspects are excluded from a systematical study in this thesis.

Terminology

This thesis makes use of a specific terminology; I have chosen wordings that appeared relevant in the context of the study, these choices do not imply any value judgements from my side. These terms are: farm domain, farmer, farm estate, farm/farming space, grazing space, land, land cover, landholder, landscape, land use, leaseholder, and rural space. In addition, I use the time-geographic concepts project, pocket of local order and timespace, and develop the notion of time-economy (the latter will be explained in the main text, too).

Farm domain. The totality of managed land with arable and forest land, including leased-in land and excluding leased-out land. For the practical day-to-day accomplishment of land use activities, the farm domain represents the functional unit of land management. The size of, and the lands included in, a farm domain fluctuate, possibly on an annual basis, which means that the farm domain is a variable entity. The use of domain adheres to its usage in Hägerstrand (1991 [1970], 1993): "*(…) a time-space entity within which things and events are under the control of a given individual or a given group*" (Hägerstrand 1991 [1970]:150). I would however suggest that, in the case of a farm domain, the issue of control is relative, when taking into account the *process landscape* aspect of reality (Hägerstrand 1993). From an activity perspective, the farm domain as defined here remains of relevance as a unit of organisation, responsibility and management.

Farmer. A person engaged in farming, i.e. growing crops or keeping animals on a farm (Longman Dictionary). I use 'farmer' as a relational term to indicate the activity-based relation between the land and the individual landholder or leaseholder engaging in land management. 'Farmer' in this sense is derived from farming as an activity, not primarily from a person's role as manager of an agricultural enterprise. A farmer can be a landholder or a leaseholder.

Farm estate. A landed property including any of the land-use classes cropland, pasture, forest and/or non-productive forest (Walestad, pers. comm., the Swedish term is lantbruksenhet). The farm estate represents the socio-legal division of the rural landscape into units of land-use decision-making.

Farm/farming space. See Rural space.

Grazing space. See Rural space.

Land. Soil and vegetation, including the spatial extension characteristic of land as such.

Land cover. Land surface with vegetation or artificial coverage. Land cover classification represents a qualitative categorization. The main kinds of land cover that occur in boreal landscapes are forest, wetland, grassland, and arable land, as well as paved-over and built-on land. The different types of land cover are mutually exclusive. Land cover is regarded as resulting from biophysical and anthropogenic processes, despite the fact that studies on changes in land cover often focus on biophysical processes and cycles (Aspinall & Hill 2008a).

Landholder. Farm estate owner. The term landholder does not refer to the degree of actual engagement in agriculture or forestry. While the population of Swedish landholders is heterogeneous and consists of various constellations of individual persons, land-use decision-making is a necessity for any farm estate owner, whereas personal bodily engagement in farming is not.

Landscape. A descriptive term denoting rural settings and an analytical term. In the latter function, landscape usually denotes scenery, expressing a way of seeing (Widgren 2010; Cosgrove 2006); landscape also means a region governed by its specific customary law and practices (Olwig 1996; Mels & Setten 2007). Landscape is therefore potentially controversial and tension-filled as a concept with either a pictorial or a social-platial sense. Finally, landscape can be used in the sense of talking about the land-as-resource in use (Widgren 2010). My use of the term landscape is not exact in that I use it for various things, the biophysical landscape and the landscape as an interface between the farmer and the land, coming to affect reflection and action in land management. From the context, it should be clear which aspect is intended.

Land use. Land use denotes cultural, economic or social values and functions attached to land resources and their use by human society (Aspinall & Hill 2008a:xviii). The authors recommend a differentiation between land cover and land use, while these terms are often confused and taken to be synonymous. Differentiation of 'land' and 'use' is helpful from an activity perspective such as applied in this study. The spatial rural land uses, forestry and agriculture, deal with the management of pasture, cropland and forest land. This means that rural land use is related to the production of goods such as timber, food, feeds, or biofuels. From the point of view of the land cover, rural land use is observable as annual crops, grass/hay for fodder, or productive forest stands. Land use is spatially observable by the land cover type associated with it, such as forestry with forest land.

Leaseholder. A tenant farmer**.**

Pocket of local order. A pocket of local order describes an organisational unit that shows distinct permanence over a shorter or longer period of time, and recognisability by recurrent activities.

"The concept 'pocket of local order' is used to describe a defined time-space area where a local order from the actor's point of view can be maintained. (…) [A]ctors in a particular time-space area perform activities according to the resources they have access to in every instant in time. (…) Time and space together with other resources are scarce factors that are decisive for the processes that will take place within the pocket of local order" (Westermark 2003:90f.).

These pockets channel activities towards specific 'routines' or sequences of tasks – therefore also

restricting the choice of actions. A pocket of local order can be seen as making suggestions concerning appropriate activities. As a synonymous term, 'time-space pocket' is used by Wihlborg (2005:2).

Project. The time-geographic concept project describes goal-orientation in human activities;

"[an] entire set of space/time-uses of people, things, and room leading up to some goal is project." (Hägerstrand 1985:201).

A project can be said to hold together various doings under one 'umbrella'. The project further provides a frame for selecting activities and resources of relevance for the project goal:

"Each of the sequential tasks in a short- or long-term project is synonymous with the coupling together in time and space of the uninterrupted paths of two or more people or of one or more persons and one or more tangible inputs or resources, such as buildings, furniture, machinery and raw materials" (Pred 1986:10).

Further, projects make demands on the future time allocation of those committed to any particular project (Hägerstrand 1972, 2009); "*[p]rojects are vehicles of goal attainment, but they are also in themselves constraining*" (Carlstein 1982:47). A project is a dynamic player that works to either maintain or change the order in a pocket of local order (Ellegård 2001:46). The concepts of pocket of local order and project can be understood as further developments of the concepts of occupation package and environment package, which are introduced in the main text.

In this thesis, I use *farm project* to connote a the undertaking comprised of individual plans, visions and spatial intentions directed towards the farm owned that motivate the acquisition and maintenance of it and make those meaningful to the farmer. I understand land management and development of the property as expressions of the farm project. In addition, I use terms such as the cattle project, milk project, crop project, etc. to denote similar on-farm goal-orientations, albeit narrower in scope than the farm project.

Rural space. Farm/farming space. Grazing space. In order to be as inclusive as possible, I often refer to space with a specific nuance: space offers resources and room for land use activities, farming activities, grazing activities, etc. I refer to 'space' here even though the usage of this word might provoke the criticism of turn landscape into a mere container for activities. The understanding underlying my use of the term is that spaces are material, concrete, and dynamic; they consist of the entities that belong to them and the complementary room in-between those entities. Space in this sense is more about the significance of the space-between-things also for the entities, especially the living ones, which are contained in space than viewing space as a container (cf. Stephenson 2005:217).

Time-economy. Time-economy is used as shorthand for the balance of the time input in land management on the farm domain, the additional necessary everyday activities, and the daily available time income on the farm (all the available time of those persons who can partake in land management). Time-economy partially overlaps with access to economic resources, as a farmer can buy time from a contractor. A related concept is that of 'time budget' used for analysing how time is allocated among various tasks (Carlstein 1982:301ff.; Kroksmark *et al* 2006:12).

Timespace. The term timespace makes explicit the fact that time and space are interlinked. A basic example to illustrate timespace is the encounter: the movement leading to an encounter occurs in both time and space, such

that the happening of the meeting can be specified by referring to *when* and *where* in relation to previous meetings (Hägerstrand 2009:96). A further aspect, as suggested by Schatzki (2010a:60), is that timespaces pertaining to activities inherently connect temporal and spatial dimensions.

Structure and Contents

This thesis summarizes, and therefore represents, the exploratory research I have conducted on land use and land-cover processes; as such, it should be read as a finding in its entirety. The contents are however structured following a classic outline to reporting research results. The thesis consists of three parts.

Part A starts with the theoretical perspective on farming and landscape applied in this study. In two chapters, I describe my approach for studying the interconnections between rural land use and the dynamics of land cover. The reader should note that these two chapters outline the (farmer) landscape as it displayed itself to me at the end of my research project. In part, concepts are discussed that I applied 'from start' to approach farming – namely those centering around materiality and corporeality as conditions in farming, the situated-ness of farming – and, in part, the presented concepts have been found relevant during the research, for explaining empirical findings – such are those centering around orientation and commitment. This has resulted in a lengthy elaborate discussion, which is held together by the reference to the archaic farming scene already introduced. A third chapter provides an overview of contemporary rural landscape and spatial land uses in Sweden, the population of farm estates, and applicable national legislation. Part A concludes with a more detailed discussion of the empirical material and the methodology.

Part B presents the findings displayed around themes. I start with a description of the land use activities and other farm-based activities on the farms studied in a number of chapters. Following this, I turn to forest clearance for arable use, which is thoroughly described, and conclude the chapter by presenting the pursuit by farmers to reorganize the farm domain in order to reach a as good a farming practice in their specific circumstances as possible.

In Part C, I give my interpretations of the farmer situation in the circumstances of the farms studied. These interpretations consider the farm background of open land. I elaborate, firstly, on aspects of time usage in land management, thinking time as an incoming and outgoing resource utilized by the farmer in the spatial practice of farming. Secondly, focus is on the values perceived in the land that apparently are many and intertwine with each other to produce a kind of path-dependency in land use decisions. I also discuss the creation of such values of land. Last in part C the farm level findings are placed in their landscape context, based on which I abstract landscape situations and their consequences for the land-cover dynamics in boreal landscapes.

The final chapter presents a summary of the thesis and its conclusions, and positions the study in the field of landscape research together with suggestions for future research. In my study, I have identified a farm-based process that bring about land-cover continuity on arable fields and, thus, persistent openness of land; I have also studied the opening-up of land by forest clearance and the placement of clearings, a process that brings expansion of the openness of land in particular regions. I conclude based on the investigation of these processes that time is a

crucial resource in farming and that strategies relating to manipulating the time demand of not only management operations as such, but of the land included in the farm are implemented by farmers. I also conclude that temporal and spatial dimensions assist in the creation of values perceived in arable fields, values that the landholders seek to re-enforce by sustained land management.

At the end of the thesis, after the bibliography, a list of the persons who have provided personal communications is provided. The appendices contain tables and figures that may be of importance throughout reading the thesis and are therefore placed separatedly, here selected quotes from the farmer interviews (in Swedish) can be found, too (for an overview, see the Table of Contents).

Part A. Perspectives on Rural Land Use in Boreal Landscapes, and in Sweden

Part A contains two chapters which present a theoretical perspective on farming and landscape (Materiality and Land use, and Landscape, Land Use (Change) and Human Activity). These chapters describe my approach for studying the interconnections between rural land use and the dynamics of land cover. A third chapter provides an overview of the farmer situation in contemporary Sweden (Rural Boreal Sweden), describing the characteristics of rural Sweden, the population of farm estates, and applicable national legislation. Part A concludes with a more detailed discussion of the empirical material and the methodology (Empirical Material and Methodology).

A.1 Materiality and Land Use

"As human beings we inhabit an ineluctably material world. We live our everyday lives surrounded by, immersed in, matter. We are ourselves composed of matter. We experience its restlessness and intransigence even as we reconfigure and consume it. At every turn we encounter physical objects fashioned by human design and endure natural forces whose imperatives structure our daily routines for survival. (…) In light of this massive materiality, how could we be anything other than materialist? How could we ignore the power of matter and the ways it materializes in our ordinary experiences or fail to acknowledge the primacy of matter in our theories?" (Coole & Frost 2010:1).

A discussion of the role of materiality is highly relevant in a study dealing with land use. In the field of geography, materiality is recently emerging as an important aspect of social reality (Everts *et al* 2010:329f.). This chapter elaborates theoretically on the implications of materiality for farming from a time-geographic perspective, focusing on the imperative continuity that material entities both demonstrate and experience in changeable surroundings. In a similar way to Schatzki (2010b) and Coole & Frost (2010), Hägerstrand (2009:81f.) underlines the fact that humans are 'things', they are visible and touchable; and that human affairs proceed and make their imprint amongst other materially appearing processes (Hägerstrand 2009:28). Throughout the text, I will use 'entity' and 'thing' interchangeably. Farming is obviously more than material, but materiality provides the ground for understanding land use from a process perspective. In the following, I also rely on the discussion by Schatzki (2010b:135-139) of the meaning of materiality for social life. The definition of materiality that I adhere to embraces "*physicality, composition, bio-physicality, nature, and environment*" (Schatzki 2010b:133). This is a broad definition, which pulls together a range of concepts in the aim of

grasping the elusiveness of materiality. In this study, it is important that a definition of materiality capture the tangibility expressed by physicality, the compositeness that indicates the spatial extension of things material, and the life processes. The latter are in Schatzki's definition circumscribed by three terms that appear to be searching in character, but also traditionally used, to point in the direction of this life: bio-physicality, nature, and environment.

To reconnect to the introduction in Linna's novel Under the North Star: Jussi and the moss are interrelated by their being material entities (in addition to whatever else they are) in an "*extra-discursive reality*" (Lidskog 1998:31); the starting scene represents a material arrangement. In fact, material properties of things constitute the objective of land use, as its goal is the creation of tangible features (sometimes to immaterial purposes, not solely to derive a material produce). Further, when land use is directed towards maintaining elements in the Nordic cultural landscape, which are associated with values of a less directly production-oriented kind – such as environmental protection, or the countryside as an amenity and resource for well-being – this can only be achieved via intervention into the material properties of the landscape. An example of this is the subsidization by the state of the management of semi-natural meadows and grasslands; types of land cover that harbour a high level of biodiversity (plants, breeding birds, mammals, amphibians, butterflies and insects), ecosystem services such as pollination, historical values, ecotourism, and aesthetic values (Eriksson 2011:3). Similarly, Stephenson (2005:46) suggests based on her field studies that landscape values build on each other, so to speak: values that can be categorized as historic, aesthetic or ecological are perceived as promoting well-being precisely because of their being present together and intertwined in one and the same landscape or landscape feature. Crucial here is in my understanding that such values are anchored in material features of land, and by manipulating these we manipulate the associated values.

Land Use Setting and Farming Situation

The land use setting, i.e. the single farm as an expanse of rural land, is composed of material entities such as people, animals, crops, land and implements. In order to understand what materiality means in this setting of the farm, I turn to the *thing structure* of reality (Hägerstrand 2009:76-100).[8] The thing structure is an expression of reality as composed of discrete things. This structure can be found on different scales, and implies that things are separated from each other by their boundaries/skins. When moving, the whole of the thing moves along. When at rest "*lasting a while*" (Hägerstrand 2009:81), when "*more or less temporarily fixed*" (Hägerstrand 2009:78), the things stabilize each other's locations by being in the way for each other. Such co-existence is both enabling and constraining for an individual entity (Hägerstrand 1993:38). Things and "*fine-grained*" abundances[9] such as cereals and water (Hägerstrand 1993:30) are side-by-side, in touch, and this 'makes space' – due to the things being thingly, distances arise between them such that they together make a "*space-for-all*" (transl.

[8] The quotes referred to as Hägerstrand 2009, derived from the posthumously published book Tillvarovaven by Torsten Hägerstrand, edited by colleagues, are my translations and have been proofed.

[9] Hägerstrand uses the rare Swedish word 'myckenhet', translatable as multitude, abundance. In addition, Hägerstrand (1985, 2009) uses 'grain' interchangeably with 'thing', a usage that is preserved in the term 'fine-grained'.

Ellegård & Svedin 2012:21) to stretch out (Hägerstrand 2009:90). Distance as the spatial extension of things in themselves and as the space in-between things and other locations is thus an implication of materiality. The time-geographic perspective presents the landscape as filled by many types of entities – not only human – in touch with each other at a geographical place over time (Ellegård & Svedin 2012). In this time-geographic view on the landscape there is of course movement included, the various entities "*encounter each other and stay together at a place for a while, and they leave each other and the place. Non-living individuals are moved by living individuals, by artifacts, or by natural forces*" (Ellegård & Svedin 2012:20).

To this description, the thing-structured land-use setting on a farm fits well. An activity perspective would be meaningless, if there were no ways to move further on, i.e. if there was no free space. Ellegård & Svedin (2012:20) describe encounters and departures, and non-living individuals being moved by living individuals, by artifacts, or by natural forces. This obviously indicates another aspect of materiality besides tangibility; and Coole & Frost (2010) refer to 'restlessness and intransigence', 'natural forces', 'imperatives', and 'survival' as qualities of materiality. Instability is introduced into landscapes and human lives by the processes enclosed in the material dimension – "*A thing lasts, but not for ever.*" (Hägerstrand 2009:94).

An additional aspect of importance pertaining to such 'thing-structured' reality is that future developments start off from any existing distribution of things which generates a next distribution, and so on (Hägerstrand 2009:64). In such a neighbourhood-configuration, there is room for novelties if they fit in (Hägerstrand 2009:64). Furthermore, living 'in' materiality brings experiences of vulnerability and effort, as indicated in the Introduction. Farmer agency can be seen to be dependent on, and required to adjust to everything that occurs on the land and in the surroundings; I therefore read farming as a dynamic relation between farmer and land, in which 'physicality', 'composition', 'bio-physicality', 'nature' and 'environment' matter. In the encounters with land, this relationship could be characterized as imposed on the farmer as the 'actor', relativizing her or his agency accordingly.

Additionally, materiality structures human co-existence as "*states of affairs and events [which] involve or happen to material objects*" (Schatzki 2010b:132). When people are purposefully placed in one or another situation together, this is mediated by material objects that are involved in their doings or are the goals of their activities. Living amongst other entities (in the sense described above) we receive, shape and re-shape material objects and arrangements (like Jussi receives an untilled moss but already has the hoe with him, or like the established farm held by a third-generation farmer family was inherited by the current farmer in an already arable and farmer-friendly shape). Materiality and social life are in fact closely interconnected – "*Materiality helps compose sociality and social phenomena*" (Schatzki 2010b:133) – when people come together around shared doings and the things used therein. Time-geography describes this by analysing how material settings display a persistent distribution of things, a local order that serves the accomplishment of specific goals (see 'pocket of local order' in Terminology). Farms, or on a lesser scale cowhouses, farm offices or arable fields, display local order in this sense. In these settings, certain specific activities fit in and others do not, and the setting therefore both invites and enables the doing of specific things such as filling in farm payment applications, milking cows, or growing crops. The complex supportive and constraining

quality of materiality helps, in the above-mentioned settings, to keep undesired things out; things can be put in a place where they are ready for the next day's work, or in the way of other things to hinder them from moving in; cattle can be driven to the pasture and kept there by the fence.

Corporeality of Things

In order to understand the farmer in action in the material setting of the farm, I now turn to a description of the (confrontation with the) corporeality of things, which can be characterized as the subject matter of time-geography, with its focus on the "*conditions which circumscribe human action*" (Dijst 2009:266). The conditions arising from materiality and the thing-structure, as described above, limit the range of locations that are in reach during a given period of time and by given means of transport, and constrain the duration of activities at these locations (Hägerstrand 1985, 1991 [1970]; Lenntorp 1976). During the course of the day, the range at which it is possible to engage in additional activities outside the 'base camp' to which we return in the evening, shrinks: towards evening, we cannot make long trips, if we are to return 'home' before nightfall (Hägerstrand 1985:206f., 1991 [1970]:148). This reasoning is a scale-free principle that can be applied to many situations (the 'return principle'). Here, I would suggest adding to the discussion the impact of past decisions, as proposed by Ahmed (2010):

"What is reachable is determined precisely by orientations we have already taken. (…) Orientations are about the direction we take that puts some things and not others in our reach." (Ahmed 2010:245).

Orientation adds an important supplementary element that can assist in understanding how 'limited reach' also pertains in the specific dimension that has to do with an individual subject's previous choices. To stay with the example of the base camp: the decision to locate this anchoring point in any particular place means that it will be this place and no other to which one returns over again. If, rather than this place, one would prefer somewhere more secure, more pleasant or whatever, one has to move the base camp somewhere else. The base to which we return and the already-chosen lines of action constrain any subsequent choice of direction. Because of this, a kind of path-dependency or traditional course of things arises, and I would suggest that this is pertinent to farmers' relationship with their land.

The working of the return principle depends on the more basic conditions, which govern corporeal entities' existence in material settings. The following three aspects are usually differentiated: material entities need space; changes in position take time; and material entities cannot exit from being present (Hägerstrand 1985). These conditions create the necessity to accept being confronted with one's immediate surroundings and the temporal situation in which one finds oneself, i.e. the necessity to deal with "*the momentarily and the locally appearing; [nobody can] take a day off from existence, not even the hibernating bear*" (Hägerstrand 2009:109).

The first condition, material entities' need for space, has already been touched upon, above; at a closer look this need differentiates into a variety of needs for space that different types of entity have. The various needs for room can be approached by looking at how they structure the packing capacity of the material settings in which the entities are located: whereas bricks in a wall can and should be packed tightly, standing

in a crowded bus packed like sardines in a tin is 'not nice'. Hägerstrand (2009) points out that humans and animals need space in various ways besides needing space as bodies with measurable extensions (and I would suggest that this applies to plants, too). Specific territorial strategies are notable in animals and humans, who attempt to stabilize territories for future 'use'. Not least 'social' complications constrain where who or what can take place, i.e. where what can manifest (Hägerstrand 1985:202; cf. Wihlborg 2011, cf. Ahmed 2010:245 quoted on the previous page). This means that human access to 'places' relies on symbolic orders of things, and the orientation one has – to put it simply, what is expected to occur where. How humans can be 'packed' points at an intricate fit of material arrangements and human occupations.

Secondly, the constraining conditions introduced by materiality produce a time-lag between reaching out for something or moving 'to' somewhere, and the time when this something can be touched or reached. The options for meetings between entities are governed by the condition that movement in space consumes time. For land use these two basic conditions circumscribing human action mean that, in order to use the land, the farmer has to move, since land is non-movable.[10] A farmer makes his/her way to where the land lies in order to 'encounter' it. All of this takes time due to the distances produced by the materiality of the entities involved.

The third condition stipulates that an individual is indivisible; 'one is there all the time' such that "*Abrupt timeless jumps to shift one's position in space are impossible*" (Hägerstrand 2009:206). The farmer can only till one field at a time, has to drive all the way to the next field before being able to till it, and while working there is not able to fetch hay from the neighbouring farmer.

The workings of materiality are highlighted by land use activities, but are not restricted to these. Entities in thing-structured reality have an 'unbroken continuity', i.e. a bodily-bound presence; in addition, this presence takes place "*in a neighbourhood with a greater or lesser degree of benevolence*" (Hägerstrand 2009:111). Materiality restrains mobility (which is implied in activities) – when conducting an activity one is required to touch 'all points' along the 'line' that is being followed. For each entity and situation, a characteristic possible choice range in space and time arises (the time-geographic prism, Fig. 1, cf. e.g. Hägerstrand 1985:202ff.; see also the above discussion of the return principle).

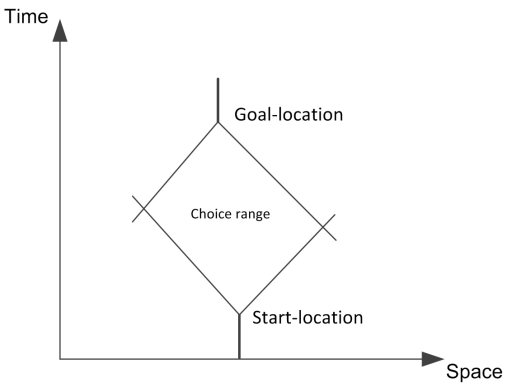

Figure 1. Limited Reach When Approaching a Goal
After Hägerstrand (2009).

To reach a goal translates, when governed by such conditions, as bringing about or waiting for the corresponding material configuration: the 'goal-situation'. Attaining a goal is possible only when the time embedded in the material configuration of entities has reached the goal-situation (Hägerstrand 2009:236). The notational prism additionally demonstrates that if one aims at attaining any goal, one's reach gets

[10] From the perspective of the time-geographer, the path of land is stationary in space, see Fig. 8.

more limited as one nears that goal (Fig. 1; Hägerstrand 2009:206ff.).

Attaining a goal is often not just about going somewhere and finding the treasure. In order to arrive at the 'goal-situation' of a ripe crop, for example, a farmer has to organise resources, equipment and time usage in a manner conducive to the achievement of the goal-situation. Things in our surroundings, Pred (1984) reminds us, do not "*emerge fully formed out of nothingness*" (Pred 1984:279). In addition, when observing events taking place in specific settings, it becomes obvious that the carrying out of any specific activity also depends on other activities being put or kept aside (Ahmed 2006).

Farming amidst Processes[11]

We might regard the surroundings of our mobilities and activities as an immobile backdrop of fixed things (cf. Hägerstrand 2009:44-56), but what Coole & Frost (2010) seem to indicate by bringing 'restlessness and intransigence' into their discussion of materiality (see quote at the beginning of this chapter) is that something is 'going on'. Hägerstrand (1993, 2009) suggests to think of our surroundings as encounters (and partings) and situations in which entities are in touch with each other (or not). Such instability of surroundings is obvious when observing a landscape totality, but only when choosing concepts which make it possible to keep the landscape intact conceptually, too (Hägerstrand 1993:34). It is an attempt of this kind that lies behind Hägerstrand's (2009:29) "*naturalistic approach*":

"By landscape is then meant not only what one perceives around oneself but everything that is present inside the chosen geographical border, including everything that moves in and out, crossing the border during the applied period of time. *(…) Such usage of the notion of landscape departs from the usual usage, which mainly encloses the static, things that remain in place. Here, everything mobile is included." (Hägerstrand 1993:26, emphasis in original).*

The suggestion made by Hägerstrand is to deal with on-going transformations of shapes and volumes, and shifts of places in a world in constant flux (Hägerstrand 2009:94-100), by conceptualising this world as a *process landscape* (Hägerstrand 1993, translation Anderberg 1996, Swedish: flödeslandskap, literally: landscape of flows)[12]. The process landscape is an analytical tool that points at a dynamic introduced by entities' movements and the flows of abundances. I suggest that in doing so, the process landscape is directed towards the extra-discursive reality mentioned earlier, a dimension that Schatzki (2010a) describes as a "*property of the world that endures independently of human apprehension, comprehension, and action*" (Schatzki 2010a:53).[13]

[11] Processes in Hägerstrand's sense is different from the way I use this term in the rest of the thesis (see Introduction), in the context of the *process landscape* discussed in this section, processes include wind, climate, seasons, erosion and sedimentation; everything driven by solar energy and gravitation (Hägerstrand 1993:28).

[12] In fact, the translation as process landscape appears inconsistent as is only counts the processes and omits the programs and projects – while the literal meaning of flow landscape is likewise one-sided, as it excludes the movements of things. In his later work, Hägerstrand (2009) applies the notion of *fabric of existence*, transl. Ellegård & Svedin (2012).

[13] It is necessary to make a note concerning the page references to Schatzki (2010a). Unfortunately, the pagination of the pp. 65-86 is dublicated in the paperback edition from 2013 utilized. I refer in the main text to the first set of pages in this interval; references to pages after page 86 might be incompatible with other editions of the book.

I suggest that in farming, the extra-discursive reality becomes tangible. As discussed above, this is mediated by materiality, by the encounter of bodies and land. The dynamic of the process landscape is driven, Hägerstrand (1993:28f.) suggests, by human projects, animals' and plants' programmes, and processes governing mineral things[14]. Metabolisms are barely implicated in the discussion of the process landscape framework, whereas Hägerstrand later provides a comprehensive terminology including notation symbols for describing entities' mergings, partings, and separations (Hägerstrand 2009:104-111). The process landscape is a vision of a landscape space that is 'produced' by various 'actors' following individual lines.[15] The advancing of the entities is not pre-given; rather, the movement of each develops in relation to the others (Hägerstrand 2009:64), and there are risks: things are filtered out (and 'in', Hägerstrand 2009:64, 2000). Navigation is a topic discussed by Hägerstrand (2009) and by Ahmed (2006) - bad readings will not bring one to one's goal; finding our way is about working out and following the 'right' direction (Ahmed 2006:16f.). Hägerstrand stresses that any passage towards a goal might contain risks due to encounters made along the way (Hägerstrand 2009:204f.) Navigation, however, once more points at a relationship, as navigation is relative to surroundings, which change during advancement of the navigator. One cannot be sure to arrive at the goal as one has envisioned it, as this depends on both one's own capacities and the movements of others (cf. Lenntorp 1976:11-15) – there is a vulnerability implied in moving ahead. As it conceptualizes processes, this landscape framework moves close to the everyday experience of a place, in which things are not given but have to be reached and continuously ordered. In addition, the notion of *neighbourhood* is applied in the *process landscape* framework. Hägerstrand (1993:34-39) spotlights the place around each individual entity: situation is less about being definable by coordinates on a map, and more about existing among others. This has previously been described as the "*continuity of situations*" in an everyday activity perspective (Westermark 2003:90). Finally, to indicate an important aspect present in the midst of the dynamic flux: living entities, as they advance along their lines, carry with them interior sides:

"Living biographies also possess an interior formed by sedimentation of experiences. (…) This interior is active in the fabric [of the process landscape] without it being representable as bundles of trajectories." (Hägerstrand 2009:123f.).

The experiences, which 'sediment', are influential for the living entities' movement along the path. How this can be described theoretically is discussed in the next chapter.

As I see it, an obvious consequence of the dynamic flux captured by the process landscape, with the different individual processes displaying varying tempi (Hägerstrand 1993:36) and life lengths (Hägerstrand 2009:136, Swedish: tillvarotider, literally: periods of existence), is that individual existences express individual times. In short, I call such temporal characteristics 'times in use'. In concrete terms, this means that the soil will thaw or warm up bit by bit, that the crop takes time to grow and ripen, that milking has to be done twice a day, and that the farmer needs rest regularly.

[14] See footnote 11.

[15] I adhere here to the usage of 'line' in Ahmed (2006, 2010), as a line of action, since it is possible to construct embedded intelligibility in all three types of drivers: projects, programs and processes. "*More or less consciously the [entities] aim ahead in time*." (Hägerstrand 2009:243).

As a naturalistic approach, the *process landscape* captures well the material setting in motion on the farm. The farming situation is 'filled' by entities of various kinds, such as stones in the fields, crops, and farmers in tractors or in the cowhouse with cows and milking facilities, as well as various kinds of abundances such as the milk, the fuel for the tractor, or the wet gathering on the field. I repeat therefore my suggestion that in farming, the transformative character of reality is especially tangible. The farmer is directly interlinked with other entities. What is at stake for the farmer in the dynamic rural landscape is finding one's way among entities and abundances, while dealing in each given moment with the being-in-touch configuration of things in timespace.

A.2 Landscape, Land Use (Change) and Human Activity

"The moss was open and desolate, in its middle almost lacking trees, only a few stunted pines with strong bark and flat crowns grew there."[16]

In the second sentence of his novel Under the North Star, Linna (1974 [1959]) portrays the landscape in which the beginning of the story is set. After depicting the man with his hoe, Linna invites the reader to imagine the scene, describing the appearance of this particular moss, where the croft will take shape. In other words, Linna places Jussi's land-use decision-making in a landscape setting. Later we learn that Jussi is on the moss because he is a farm-hand and is now seeking to build a place of his own for his family, and that the landlord, from whose point of view this is a useless patch of land, has agreed on him being able to utilize it for this purpose. This gives the rather concrete description of the site a dramatic dimension. It is however not my intention to embark on a literary criticism of the book; instead I would like to highlight the fact that the beginning of the story contains a description of landscape as concept that is worth noting. The landscape acts as a necessary tool to tell the story, but it is also described as an entity which Jussi's land-use decision-making relates to: after depicting the future farmer with his hoe out on the moss and describing the characteristics of this particular moss, Linna introduces movement in the third sentence of the novel:

"Jussi moved around the moss, stopping, looking around, observing and appraising."[17]

Linna has Jussi explore the piece of land and get to know the place. A consequence of this will be that a specific, material and at the same time representational farmer landscape starts to unfold around the future farmer. In Linna's description, this landscape involves a gathering of views by looking at, walking over and evaluating the land from several points of view, all of which eventually provide Jussi with a representation of the moss. At the same time, Jussi's landscape also involves the tangible setting without which the imagination would have nothing to take off from; no landscape would be taking shape in Jussi's mind and plans. This double aspect of landscape is mediated by the body, by the embodied Jussi's walking about. Additionally, as I have already touched upon, there is a background to the situation of Jussi

[16] Linna (1974 [1959]:7, my translation).

[17] Linna (1974 [1959]:7, my translation).

being on the moss with a hoe, and getting excited about a brook that would allow him to drain the land, as Linna tells the readers a few sentences later. Jussi starts to connect himself to the particular setting of the moss, it becomes for him more than just any moss. Here his croft will stand, this will be his place, which means that amidst the mere materiality of the site, a variety of symbolic aspects will begin to take shape.

Landscape as Representation and as Place

I allude to Linna's story because it presents a useful intertwining of materiality, representation and place. The latter two aspects are usually included in the notion of landscape: landscape as scenery and landscape as a lived-in place or region. As a third aspect, landscape is often presented in terms of land-as-resource, thence pointing at land use and landed capital (Widgren 2010:71). The resource aspect most clearly rests on the material features of the land. However, in this intertwining of representational and platial aspects of landscape (with regard to the moss), material features play an interesting role. In order to explain how I think of this, I take a step back to discuss each of these two understandings. Landscape as a representation of scenery encompasses "*a way of seeing*" (Widgren 2010:71; Cosgrove 2006:51), be it a painting or a 'painting with words', or a concrete vista from a specific vantage point. Cosgrove (2006) explains that the meaning of the word landscape, in English, encompasses "*framed views of specific sites and the scenic character of whole regions* (Cosgrove 2006:51).

This way of presenting landscape as scenery has static traits. It has also been suggested that landscape constitutes an actively shaped interface in our perception of the world (Dubow 2009). Such view is also propounded by Hägerstrand (2009), where landscape is seen as representing a way to deal with the sensuous prospect that "*encloses us in our daily activities*" (Hägerstrand 2009:271), and becomes a frame or rather an on-going framing generating individual perspectives on the world. Hägerstrand (2009:38ff.) discusses how selected aspects in a view might be of (more) interest, rendering (other) aspects of the totality superficial for the time being.[18] This implicitly points at the intertwining of the process of framing with the activities through which the actor moves around the place, producing images from many sides. This is how I imagine the farmer, sitting near the window in the farmhouse kitchen, or walking over the lands, like Jussi on the moss, surveying the land both physically and in his imagination, pondering over past and future activities. The frame as concept has been previously established elsewhere, too: Perri (2005) describes how a frame organizes experience and biases for action:

"First, frames organize experience (…), they enable people to recognize what is going on, they provide boundaries, define what counts as an event or a feature; crucially, frames define what counts as relevant for attention and assessment. Secondly, they bias for action; (…), they represent people's worlds in ways that already call for particular styles of decision or of behavioural response." (Perri 2005:94).

An individual frame thus transforms aspects of the past and provides orientation with regard to

[18] Hägerstrand (2009) uses the rare Swedish word avfjärming, and also talks about a frame for action concerning the sensuous prospect, which I took to support a translation as 'frame'; the term 'avfjärming' refers to the process whereby the individual gains an individually possessed view of the world (Hägerstrand 2009:42). Here I use 'frame/framing' for (gaining) individual perspectives on the world.

what is ahead (in the course of moving on into future) (for a socio-psychological discussion of the notion of frame, see Beland Lindahl 2008:68-93). Ahmed (2006) compares this process to a line:

"We then come to 'have a line', which might mean a specific 'take' on the world, a set of views and viewing points, as well as a route through the contours of the world, which gives our world its own contours." (Ahmed 2006:17).

In this usage suggested by Ahmed the line and the frame in fact merge, which contrasts against what is the usual interpretation of the time-geographic *path* as a retrospective analytical device. A frame in this sense can thus be seen to be more than a single-usage orientation tool, helping us to select aspects of interest in an on-going situation; a frame can also be taken as enabling us to accomplish deeds without needing to start searching from the beginning every time/every day. In addition, the fact that many daily choices are made fleetingly as we move through life demonstrates the depth of a frame as a provider of orientation (cf. Ahmed 2006:27). I would suggest that the explanation of being-at-home (in the sense of being knowledgeable of one's surroundings) in the following quote (Hägerstrand 2009) indicates 'why' and 'how' framing has to do with engagement with a place over time:

"Being-at-home at a specific place means that one can easily mobilize ideas about what exists where – not everything, but things that have previously been noted and have lodged in one's mind. Such being-at-home results from observing, listening, talking and doing in many situations over a long period of time." (Hägerstrand 2009:42).

The quality of being-at-home can obviously stretch over generations, as expressed in Gunnarsdotter's (2005:274) observation that persons with family roots in a landscape receive from their families a fund of local knowledge, memories, and interpretations of collective symbols, which is handed down through the family. A person who is knowledgeable of the history of a piece of land will perceive that history in that piece of land when observing or imagining it. As symbols (or semiotic signs), the things anchor memories and 'local knowledge' (whereby the word 'local' already implies this!).

We act according to what we perceive, and what we perceive depends on sediments from previous experiences (Hägerstrand 2009; Perri 2005), a process that also stimulates the diversity of perspectives on the world. This line of reasoning can be continued towards the working of dispositions, the Bourdieuan *habitus,* to reproduce the practice of farming (Setten 2002, 2004) (I return to this below when discussing the notion of *substantive landscape*).

Following such reasoning, framing obviously does not only lead to the development of individual views on things; it also leads to the creation of individual 'prospects', which anticipate goals.[19] The 'view of the world' resulting from framing is therefore both connected to the past – it is a kind of retrospective knowledge – and linked to the future, thus attaining the character of a prospect. In other words, this could be described by saying that we carry landscapes, i.e. frames, with us from place to place, based on specific settings we know well; our vision casts this mental image/representation over each new landscape encountered as we advance through life. For

[19] I use 'prospect' in its double sense of "*something that is possible or is likely to happen in the future*" and "*a view of a wide area of land, especially from a high place*" (Longman Dictionary). This usage of 'prospect' is inspired by Don Mitchell's lecture, April 24th, 2011, at Dept of Human Geography, Lund University.

example, to return to Jussi's process of thinking about how to make the moss arable: his prospectual image of the drained land as the place of the croft allows him to advance. He comes with an idea, floating around him, as it were, which is hinted at by the fact that he has the hoe with him (why should he visit a moss with a hoe if he was not intending to use it – in one way or another?!). He still, however, has to find out if and how this specific setting might provide resources to facilitate the materialization of the idea. It is through the linkages to past and future encompassed in the individual frame that activities gain direction and orientation: I maintain further that the frame as a constructed view of the landscape is not only re-applied onto the landscape, from which it is abstracted; it itself evolves, carried along while advancing to new situations. In fact, thinking time-geographically this would be impossibility, since time continuously makes our surroundings shift and us. Based on such reflection, the description of landscape as an actively shaped interface in our relation to the world (Dubow 2009, above) becomes clearer. Linna offers a perspective on the double landscape, namely as a mental representation and a material setting.

Complementing the pictorial-textual understanding of landscape, a substantive landscape concept has emerged (Widgren 2010:70ff.; Olwig 1996; Mels & Setten 2007) which 'fills' the landscape with social, institutional aspects such that the landscape "*articulat[es] a polity's ideals and practices of (customary) law and justice*" (Mels & Setten 2007:199). The archaic farming situation depicted by Linna tells us that this was the way it was done both bodily and socially. In Linna's novel, the event of Jussi finding himself on the particular moss has its background in Jussi's relation to the landlord to whom he will remain in a dependency relation as crofter when his future home has taken shape.

The notion of substantive landscape, based on a North-European understanding of Landschaft as a region with its laws and customs (Olwig 1996:630; Cosgrove 2006:53), describes "*way[s] of communicating, way[s] of acting*" (Widgren 2010:71), "*a place of human habitation and environmental interaction*" (Olwig 1996:630). This understanding of landscape as substantive can be taken as a critique of the comprehending of landscape as merely visual – as a still representation from a specific point of view. According to this critique, the flattened perception of landscape connects to the assertion of power, namely the creation of a single perspective on things not only practised in pictorial representation on canvas (Seymore 2000), but also concerning the very materiality of one's surroundings (Germundsson 2001; Duncan & Duncan 2004; Mitchell 2008). Making landscapes merely visual things has further been criticised as paving the way for a banalization of the landscape, and a disarming of the people in the landscape, all of which deprives the landscape from being "*an actor itself*" (Setten 2004:405). In my understanding, such agency evolves from the time-depth of practice, as discussed by Setten (2004).

Furthermore, a landscape of ideals and customs describes a place governed by norms, by certain ways of life established as given, sanctioned, accepted and desired. Such a landscape situation contains expectation, and prescription, vis-à-vis an established 'course'. When individuals move within such a landscape, they relate to these givens, and may choose to either align with the suggested line of action or break the customary mode of doing things. In an interesting way – utilizing the concept of investment – Ahmed (2006) highlights this:

"Following lines also involves forms of social investment. Such investments 'promise' return, which might sustain the very will to keep going. Through such investments in the promise of return, subjects reproduce the lines that they follow." *(Ahmed 2006:17, emphasis in original).*

In breaking new ground on the moss, Jussi is giving new expression to the land cover at the site of the future croft, while socially his land-use decision might be perfectly in line with prevailing patterns of action.

Landscape, Practice and Activity

In this section, landscape is discussed as interconnected with land use practice and farming activities. Taking the substantial conception of landscape further, the question arises of landscape as individually framed and socially defined, when several persons are involved It has been suggested that practice mediates in this, albeit in different ways (Schatzki 2010a; Setten 2002, 2003, 2004). I start here with a discussion of practice, which is continued in the next section (Landscape and Activity).

Social Practice

Schatzki (2010a) elaborates that landscape can be perceived as plural, and he stresses that this is neither due to the manifold geographical places, nor because landscape makes an entity relative to individuals, but "*insofar as multiple practices are carried out on or in relation to [the given landscape]*" Schatzki (2010a:106). In other words, Schatzki suggests that at any locale, landscape consists of many timespaces, which accompany the practices in that place. Landscapes are intersected by what Schatzki (2010a) terms *activity timespaces*, practice-specific orientations:

"Activity timespace is the dimensionality of activity. As a result, there are, strictly speaking, as many activity timespaces as there are human activities. *Because activities are multiple, so, too, are timespaces. Activities of any given type can be individuated, moreover, by their position in objective time and space. (…) Analyzing how objective time and space individuate activities requires attention to human bodies since activity (…) centrally consists in the performances of* bodily *actions. Futher complicating matters is the fact that another individuating feature of activities, and thus of timespaces, is whose activities given activities are, (…), which persons' performances they are. Activity timespace is the property* of a person, *or* of the existence or life of that person." *(Schatzki 2010a:68f., emphasis added).*

Here, the anchoring mentioned above reappears as individuation, tying activities and their meaning to particular persons in particular times and locations. The importance of this view for a study on land use lies in its clear connection to the materiality of things and human bodies. In an intricate attempt to clarify practice memory, Schatzki (2010a) sheds more light on his landscape understanding:

"Landscapes are bound up with practice memories insofar as landscapes are incorporated into the organization of practices – as objects or referents of rules, as the contents of ends, and as objects of projects or understandings. (…) [L]andscapes that are contained in practice memories can be objectively past, present, or future: past, present, and future landscapes alike can be incorporated into the organization of practices. (…) Through memory, therefore, landscapes are ensnared in complex intercalations of objective space-times and activity timespaces." (Schatzki 2010a:105)

Applying this to the present context, it follows that the farmer landscape can be understood as interjected into the farmer's surroundings,

partially tangible and partially intangible, partially shared with other farmers and partially unique due to the unique bodies involved. Landscape is closely related to memory, appearing a potential carrier of memories. The farmer landscape is thus open towards what has been in place before, what is present as memories in it or its details. Such memories open up a space, as it were, where current doings (can) take place.

The same surroundings come to contain other timespaces when tourists set up a tent on the emptiness of the grass (for the farmer this is the hayfield with a growing crop that should not be disturbed) or when the town-dweller comes to the countryside expecting silence in nature (which harbours the farming setting, too, with all its noises). Previous findings from Norway suggest that members of different social groups carry differing ways of relating to landscape (Setten 2004; see also Setten 2002). Farmers on the one hand appeared to relate to landscape 'from within', relating thus to a constantly changing entity essentially formed by farming; administrators at planning authorities at the other hand appeared to fix and objectify land by its constituent elements by the administrative measures applied, seeking "*a standardized visual expression*" (Setten 2004:407). This suggests not only that one and the same landscape can be perceived differently from the points of view of individual farmers or administrators (or tourists or town-dwelling guests), but also that farming practice and administrative practice (or tourist practice) have different relationships to landscape (features). So not only do we carry landscapes, i.e. frames, with us from place to place, but in what we do we also adjust to the 'frames' given by practices, and places. We do what is appropriate according to what we are doing, but also according to the place.

Observable commonalities in individual activities derive, Schatzki (2010a:68ff.) argues, from engagement in those activities and not from membership in a social group; commonalities arise from what is pre-given in the (activity) situations. As Schatzki (2010a) sees it, normativity is reinforced by participation in social practice; his definition of social practice encompasses "*an open, organized array of doings and sayings*" (Schatzki 2010a:73), and there is variation historically and geographically between practices such as "*political practices, horse breeding practices, training practices, cooking practices, religious practices, trading practices, and teaching practices*" (Schatzki 2010a:73). Elsewhere, Schatzki (2010b:129) defines practice as "*spatial-temporal manifolds of human activities*". Normativity in this view connects to the practical intelligibility of doings – according to (Schatzki 2010a:73) the knowledge of how to carry out an activity, the at times clear prescriptions that instruct one how to perform an activity, and the customary ascribing of certain practices to specific ends they are usually pursued for.

Obviously, it will be the individual's decision whether to conform to or reform the prevailing ways of carrying out individuated bodily actions; these decisions can then modify prevailing practices. Stability in material settings is about the fit of a project with an established order of things at a locale, the practices usually engaged in[20]. What is important to stress is that activities fit both their setting and the project goal, tying them together. Activities, settings, and project goals (i.e. intentions) are qualitatively different, and this is something I wish to highlight.

[20] In Schatzki's (2010a) discussion, an obvious parallel to the time-geographic concepts 'pocket of local order' and 'project' can be discerned (see Terminology).

Intangible values/intentions are linked by activities to material settings, and *vice versa*.

Another view on how activities mediate the relationship between individual and social landscapes comes from Setten (2003), who describes farmers' relationship to land as follows:

"[T]hey [the farmers] express a long-term memory of the practices shaping the land. They are embodying past practices, both their own and their ancestors' practices. This suggests that the landscape is also embodied; it is carried through a lived life (…)." (Setten 2003:141).

The farming practice produces landscape, as Gunnarsdotter (2005:210) reminds us: The farmers 'create the land' by forming the agrarian landscape (as quoted in the Introduction). Both practices and landscapes possess a time depth, which in fact appears implied by the concept of substantial landscape as a place of human habitation and environmental interaction, as Olwig (1996:630) formulates. Advancing in this vein, Setten (2004) brings in habitus as "*our customary relationship to the world shown through our embodied expressions, understanding and actions present at any time*" (Setten 2004:406), "*ty[ing] the farmers, their embodied practices and the landscape together*" (Setten 2004:406). The suggestion here is that as habitus governs the modalities of farmer actions, the landscape is shaped in accordance with what reinforces the customary relation between farmer and place.

Both Schatzki's (2010a) approach and Setten's (2003, 2004) indicate that human activities enact and represent a shared landscape and individual projects at one and the same time. In the context of this discussion, it is important to be mindful of criticisms articulated concerning understandings of practice (Sayer 2013) and habitus (Pred 1981). Thinking in terms of practice should facilitate an understanding of both the support and the constraints an individual derives from the way things display themselves around her – yet it should not belittle the fact that people usually maintain an "*open-ended evaluative relation to the world*" (Sayer 2013:5). Practice might risk representing people as passive, as merely responding to the workings of (the Bourdieuan) dispositions that can be described as inherited, tacit knowledge of how to act and behave in any type of situation (Wilkens 2007). While practice viewed thus might turn into mere duplication of previous activities – and this is also the risk with a definition such as Schatzki's of practice as manifolds of human activities – time-geographically speaking mere duplication is never possible, as new situations never replicate old ones. Pred (1981) questions the ability of habitus to account for the everyday localized choices of individual persons. While linking extra-discursive reality, the individual and the social remains a tricky task, the notion of habitus nevertheless represents an approach to making farming choices something more than an expression of individual farmers' preferences, or an inevitable result of membership in any particular social category.

One might thus think of the *substantive landscape* as a composite of intersecting landscape enactments, created by being practiced and linking individuals both to each other and to the deeds of individuals in the past. I think here that it is crucial to be inclusive of the material aspect – i.e. in this case of the rural landscape, the farming surroundings or other practice settings – since materiality both carries practice memories and is the medium by which landscape becomes a shared landscape. Landscape then becomes a necessary interface when relating to one's surroundings, while landscape representations cannot exist without concrete places with their material features. Therefore, I would suggest that an elusive material landscape is just 'around the corner' at

the background of the three conceptualisations of the *landscape*.

Landscape and Activity

I have described our doings in the world as springing forth from knowledges gathered as frames and from specific doing(s) we know well, adapted to where the doings are carried out. I have further described the 'social' entering into individual doings via 'recipies' and the pre-scription/design of material settings to specific activities. The relationship between material landscape and human activity needs further examination, so I will now revisit the moss once more. I suggested, above, conceiving of Jussi's endeavour to create arable land as oriented along a line, as it were, between the motivation to establish a place of his own (for his family) and the end of transforming a particular moss into this place. In this, I rely on Schatzki's (2010a) notion of *activity timespace*, mentioned in the previous section, which he says "*consists in acting towards ends departing from what motivates at arrays of places and paths anchored at entities*" (Schatzki 2010a:60). Schatzki (2010a) goes on to explain the activity timespace in relation to other times and spaces:

"The timespace of human activity (…) is just as pervasive in human life as is proceeding in objective time and objective space. (…) Although human activities occupy positions in objective successions, and although people have long regulated their activities by reference to periodic processes (…), people inherently come toward and depart from in acting. Similarly, although human activity ineluctably negotiates the objective spatial features of things, it intrinsically institutes and is attuned to place-path regions. Temporalizing and spatializing are inherently of and in human activity and life. (…) [T]he objective temporal and spatial properties of activity reflect its timespace." (Schatzki 2010a:62).

Schatzki further stresses his view of time and space as inherently connected via the timespace that human activity "*institutes and bears*" (Schatzki 2010a:60). This view on a timespace borne by the activity, when related to the idea of the path of material entities advancing in the process landscape, would lend the path an experiential practice-related meaning. Further, the enactment of Jussi's plans and visions concerning a place for living and the particular moss depicted will create a place-path region, while the plans and the place are initially linked together by the digging of the ditch for draining water out. This concrete spot gains an anchoring function as it allows the subsequent clearing practice to be enacted here (by which additional anchoring will occur).

The decision to start to work out the vision enforces a commitment directed towards the specific prospect (the croft), and the following of the orientation that this commitment prompts, will take time and effort, before the croft thus envisioned will be constructed, bit by bit, and materializes. Thus, Jussi starts to invest his time and capacities in the moss, solving the task of making it arable. This commitment to both this his project and the particular moss at hand has implications. I derive from Ahmed (2006, 2010) an understanding of how exterior lines of action go hand in hand with interior experiences of commitment and identity, and vice versa:

"You make an investment in going [the following of a line] and the going extends the investment. (…) If we give up on the line that we have given our time to, then we give up more than a line; we give up a certain life we have lived, which can feel like giving up ourselves." (Ahmed 2006:18)

The project on the moss, while expanding, also expands in Jussi himself, taking up a larger and larger part of his pre-occupations, and probably becoming part of his identity, too, in the long

run. Through the commitment to the project, his future paths are directed (possibly re-directed), from anything else towards returning repeatedly to it. From the first anchoring point – the brook to be deepened – detailed series of tasks evolve (which can be thought of as being sensitive to continuous evaluation of what progress is being made). In order to carry out the tasks triggered by his commitment Jussi needs to be on the moss, so he is required to be physically present time and again – a fairly self-evident conclusion that has consequences due to his bodily materiality, possibly precluding him from performing any other task at the same time (such as for the landlord at another location).

He starts to move things, and by this, the whole setting is brought into evolution, while Jussi's place in the landscape, i.e. his landscape, starts to take shape. It is clear that his motivation (to establish a place of their own for his family) and his goal (to transform the moss into this place) steer the project and its activities, both overall and in detail; and similarly, it is clear that the material transformation the moss is subjected to originates from this his project. One might further suggest that what he perceives while working is how far or how near he is in relation to the goal-situation; presumably, any specifics regarding the material entities encountered are assessed from this point of view. His commitment to transforming an idea into reality creates a specific *activity timespace* anchored on the moss.

The idea of occupations coming in packages (Hägerstrand 1972) enables a more detailed analysis of how commitment means a prescribing of future occupations. This relates to the above discussion of Schatzki's (2010a) view on practices as manifolds of human activity, and the customary ascribing of certain practices to ends they are usually pursued for. Occupation packages signify aggregations of activities that as such are prescribed formally, although not in every practical detail, as "*lists of time usages*" (Hägerstrand 1972:34). Preparing a meal, for example, implies shopping, selecting ingredients, preparing access to cooking facilities and equipment, switching on the owen, making a dish by heart or by using a cook-book, etc. Some of these activities can be performed separately from each other, while others need to be carried out in sequence. What is important to note is that the occupation package entails temporal extension: it takes time to perform the sequence. This is because a basic characteristic of human activities is that they appear as sequences of time usages, even the most meditative doings (Hägerstrand 1972:17).

Of additional importance, besides the temporal extension, is the fact that any occupation has its environment (Hägerstrand 1972:20). It is difficult to prepare a meal in an office or in the forest. Rather, preparing a meal, even in the forest, requires a suitable environment.[21] To stay with the forest example: to be able to prepare a meal there, one would need to have brought the ingredients and cooking equipment, as well as gathered wood to make a fire – meaning that, in order to engage in the occupation of preparing a meal in the forest, the forest's environmental setting must be prepared first, whereas a kitchen has already been prepared for cooking. Such intelligibility in the succession of actions and their environments has been discussed in the time-geographic context by the geographers Friberg (1993), Hägerstrand (1972), and Pred (1981, 1986), and has been assessed from the perspective of the time-budgets of various spatial practices by Carlstein (1982).

[21] This additionally indicates that our surroundings generally consist of places that contain orientation towards specific types of activities.

We know that we need to set aside time for preparing tomorrow's supper. Once we have started to prepare the meal, it starts to make demands on future time use, too, until the meal is ready. Commitments more comprehensive than preparing a meal make correspondingly more extensive demands on future mobility and time use. The commitment to making the moss arable allows for flexibility, but also limits Jussi's future time-use options, i.e. activity options, as long as he remains committed to the project with its corresponding activities and locales.

In addition, during the course of a day or a week, we typically engage in various activities which to some degree belong to different occupations. The activities in different occupations are often mutually exclusive and therefore make something like contexts for each other; one way to shed light on the contexts that activities continuously make for each other is to envisage the individual's daily advancing as a path, as has been discussed. The following quote from Friberg (1993) summarizes the core message of the conditioning of human activities by materiality:

"The basic hypothesis advanced by time-geographers is that when an individual finds herself at a specific moment in time, the action-space for possible choices is limited. As a single individual she only has limited control over its contents. When she has made her choice and more time has passed, the action-space has changed, but it usually resembles the previous one to a greater or lesser extent. This means that an individual's life does not consist of a number of independent and differentiated phases, even if time can be used as a measuring instrument to distinguish them from each other. Thus it is reasonable to suppose that an individual's separate choices hang together. The choices made are often parts of a shorter or longer programme that the individual is attempting to conduct and the succession of choices during a person's lifetime can be called that individual's personal biography." (Friberg 1993:67).

I would suggest that the 'hanging together of choices of action' described here evinces the characteristics of activity timespace, and connotes the existence of project goals. This 'contextualisation' of activities by other activities "*requires attention to human bodies*" (Schatzki 2010a:68, see quote p. 25), since an embodied individual's activities hang together in an individual line of succession, i.e. are individuated by being bodily performed by somebody who cannot 'abruptly jump aside'. In short, the organisation of activities and the corresponding material settings are co-constitutive (Schatzki 2010a, 2010b:140) and appear as timespatial choreographies (Hägerstrand 2009:157). Materiality in this context is about the distinctness of things (as highlighted by the idea of the thing-structure) and the dependency of human activities on the availability of things other than human bodies; however despite of humans also being things amongst other things, human practice also is about relating to things by adjusting and arranging them and reflecting over them. This double aspect can also be found regarding the setting in which activities are carried out.

Objective space and objective time are discussed by Schatzki (2010a) in their simultaneity with (practised) activity timespaces, as already touched upon; further, one can state the primacy of the activity timespace over the objective 'timespace' as the example below demonstrates. Despite the primary inclusion of activities in specific timespaces, it is in many instances the material world, which remains targeted by human activities. For example, the activity of writing is performed in order to accomplish the criss-crossing line of ink, which in the activity perspective makes a readable text. An example

provided by Schatzki (2010a:55) illuminates this: the tip of a pen breaks off, leaving the writer staring at the thing in his hand, now a useless piece of material. The writing equipment has fallen out of the activity timespace, in which it 'was' due to the activity of writing, whereas it is now merely located in objective space and time. Of course, in general, the pen must be regarded as having already been an objectively locatable and datable entity before the tip broke off, while also being part of the activity of writing. An objective feature in space and time gains, by inclusion in a human activity, activity-specific temporal and spatial dimensions and is to be explained and understood as part of the corresponding activity. An object may 'drop off' and appear as merely an objective thing in the objective space (landscape) on losing its associative links with an activity, as in the example of the broken pen. My viewpoint is that land use studies need to take such overlaps in landscapes into account.

In addition, the simultaneity of timespaces highlights how motivations and ends belonging to the activity timespace 'appear' in observable situations, which are then felt to be nearer or further away from the attaining of what one is oriented towards (the goal-situation). As Schatzki (2010a) maintains: "*[T]he objective temporal and spatial properties of activity reflect its timespace*" (Schatzki 2010a:62). The objective aspect in activities also explains why land as the object of land use acquires 'agency', and becomes an 'active' part in land use by way of co-constitution of land (cover), land use activities and land-use decisions. Taking this further, when I stop writing on paper altogether, the pen becomes useless. Similarly, an open field may become 'obsolete' due to transformations in the motives for and/or ends of activities, and 'fall out of view', thereby risking a discontinuation of maintenance. An example of this would be passive reforestation, which often occurs in boreal landscapes due to the abandonment of fields for reasons other than insufficient fertility of the land or damage by salinization or decertification, which would equal the broken pen in the example. In this context, Hägerstrand's key argument (1993, 2009) becomes very clear: the material configuration of the objective timespace (the process landscape) changes by every move an entity 'makes'. Resulting from human activities, the objective distribution of things is re-moved towards individuated human goals with consequences for other entities, although when we perform and reflect upon our doings, we understand them as nearer or farther in relation to our ends, and not necessarily in relation to the other entities' ends.

This discussion implies that 'more' landscapes exist around the farmer than the material tangible landscape, yet these more-than-material orders of things remain anchored in and by the materiality of entities. The rural landscape, as an evolving setting transformed by what I call 'times in use' (see chapter A1, section Farming amidst Processes), thus also contains the individual farmers' times in use. And, as most landscape settings already contain modification towards specific human affairs (cf. Aspinall & Hill 2008b), i.e. have been shaped to accommodate specific practices, it can be assumed that landscape evolution can be examined in terms of the interplay between land use activities and their corresponding environments, and similarly, in terms of what this means for the individual who is committed to performing activities in these specified settings. Based on the discussion in the previous and this chapter, I argue that the farmer landscape should be viewed as both constructed and material, constituting a frame of reference and counterpart for land use actions, providing orientation (retrospect and prospect) when the farmer advances in timespace.

A.3 Rural Boreal Sweden

The Scandinavian countries and Finland belong to the boreal zone that also embraces (parts of) Canada, Alaska and Russia. As mentioned in the introductory chapter, this study applies the geographical definition of 'boreal' as "*belonging to the north*" (Penguin Dictionary of Geography 2003); the boreal refers to geographical areas covered by northern coniferous forests in the corresponding climate zone with snowy winters and short summers. In Scandinavia and Finland, the boreal alternates with arctic and alpine landscapes. Almost all Swedish rural landscapes are located in the boreal zone (with the exception of the southernmost half of Skåne, cf. Swedish National Atlas 2002), and show a mix of mainly forest and arable land, while in the north of the country there are extensive wetlands, tundra and bare rocky areas alternating with large expanses of forest (Jansson 2011a:28-35). While it is fair to say that agriculture and forestry are the major influences shaping land cover for most of the country, reindeer grazing is of importance in the north (Statistics Sweden 2008:73f.; Emanuelsson 2011a). Reindeer grazing lands cover approx. 50% of the Swedish land area, which means that reindeer also graze land areas dedicated to other land uses (Statistics Sweden 2008). In these landscapes, arable land can be seen to be a special case, distributed as smaller or larger accumulations of pasture and cropland. Forest land covers 58.2% and arable land 8.4% of the land area (Statistics Sweden 2013, Table 1). Of the arable land area, semi-natural pastures cover approximately 14% (Swedish Forest Agency 2013). Observe that the area covered by mainly bare rock far exceeds the arable land area, and that open bogs cover an area slightly larger than the arable land area (Table 1). Swedish agriculture of today is regionally specialised to areas with predominantly (cereals) cropping or animal husbandry (Ihse 2005; Jansson 2011a). The main crops have traditionally been hay (today less than one third of the cropland area); fodder grain (today approx. one third of the cropland area); and cereals (in the main, approx. 10% of the cropland area) (Morell 2011b). Rural land additionally embraces protected lands such as national parks and Natura 2000 areas (Statistics Sweden & Swedish Environmental Protection Agency 2012); golf courses – mainly in proximity to urban and coastal areas; ski pistes; areas for peat harvest; and various pits (gravel, sand, rock and industrial minerals; Statistics Sweden 2013).

Table 1. Land use in Sweden (2005).
The relative figures for percentage of the land area have been calculated by the author. Sources: Statistics Sweden 2013; Swedish Board of Agriculture 2011, 2008; Statistics Sweden & Swedish Environmental Protection Agency 2012.

Land use in Sweden (ha)	**2005**
Arable land	3431336
Forest land	23888600
Build-up land and associated land	1305365
Mining and pits	47300
Golf courses and ski pistes	36050
Open bogs excl peat bogs	3867550
Natural grassland, heathland etc	3229950
Bare rock, other land	5236300
Water area	3995990
Total area	45029500
Land area	41033510
% arable land	***8,4***
% forest land	***58,2***
% build-up land	***3,2***
Arable land in 1919	3790496
% arable in 1919	*9,2*
Potential for reclaiming	700000
% potential	*1,7*
sum arable&potentially arable	4131336
% sum arable&potentially arable	*10,1*
Protected land area (2011)	4423533
% protected land (2011)	*10,9*

The rural land uses agriculture and forestry rely directly on the soil. In Sweden, the soils consist of unstratified glacial tills mainly deriving from primary rock, mixed with organic peat soils; lime rock and/or fine postglacial sediments influence the soils regionally or locally in a more favourable direction for agriculture (Swedish National Atlas 2002; for Nordic sedimentology, see Sporrong 2008, which includes a generalized land cover map, p. 582). Agriculture in boreal landscapes is constrained by the occurrence of stones, boulders and rocks, as well as by wetlands and the Scandinavian climate (cf. Messing 2011; Statistics Sweden 2008). One typical feature of the climate is that there are large inter- and intra-annual variations such as dry or wet summers (Messing 2011).

The Swedish boreal forests of today can seldom be called native. Forestry interests targeting economic returns and unimpeded access to timber have transformed much productive forest land into dense spruce stands of equal height, cut across by an extensive network of roads and tracks (Statistics Sweden 2008:19; Axelsson 2001). During the 20th century, forests have become denser and historical infield land has been afforested, although it has sometimes been converted to cropland (Flygare 2011a). Especially in Northern Sweden, the transformation of the land cover due to rational forestry production has been characterized as dramatic (Josefsson & Östlund 2011). This development must be seen against the backdrop of what was the poor condition of forests at the end of the 19th century; the dense stands represent a century-long effort to manage the timber stock (Kempe 2011) in order to safeguard the interests of the forestry industry (which is an important component of the Swedish economy). Due to the promotion of rational land use in agriculture and forestry, today's boreal landscapes often display vast stretches of single-type land covers, and sharp borders between arable and forest lands (Figs. 2-4, see also the photos on the front cover).

Figure 2. Border between Arable Land and Forest

Figure 3. Vast Openness of an Arable Field

Figure 4. Open and Closed areas in a Landscape with Arable and Forestry Land Uses

The forest and arable lands of the present day originate in part from lands that were previously wetter, if not directly classifiable as wetlands. The extensive meadows of previous times were wet (Ihse 2005) and productive land has been gained via drainage and a large-scale lowering of the water level of lakes (Emanuelsson 2011b). In their review of national budget propositions during 1900–2000, Antonson & Larsson (2011) uncover extensive economic support from the

state during the first half of the 20th century for initiatives concerned with making the land drier – support that fuelled the construction of drainage systems on a range of land cover types, from arable and wetlands to forest[22]. The support was aimed at mitigating frost damage, and later also at securing employment (Antonson & Larsson 2011:134ff.).

The authors describe their impression after ploughing through the documents:

"The large allocations targeted at land improvements provide a picture of Sweden as enormously stony, wet and impassable, the latter two also applying to the forest." (Antonson & Larsson 2011:140, my translation).

Reclaiming wetlands and mosses for arable use represents an example of anthropogenic ecosystem change, while it is also about landscape change, creating the *cultural landscape* which denotes "*the natural landscape as modified by human activities*" (Penguin Dictionary of Geography, cultural landscape)[23]. This definition of the cultural landscape characterizes a global situation, since most parts of the globe have been modified by human activities (cf. Aspinall & Hill 2008a). Correspondingly, the dictionary continues its definition of cultural landscape by saying that the term can be seen to refer to "*most of the present landscape, there being very few parts of the world now unaffected by such activity*" (Penguin Dictionary of Geography, cultural landscape). This is of course true of boreal landscapes, too, the draining of many mosses for arable land being only part of the transformation that the Swedish landscape has experienced. In other words, seen in the context of rural natural resource management, farming both enhances and exploits natural processes and ecosystems (Jansen 2011), and consequently, agriculture and forestry can be regarded as having had both positive and negative effects on the environment and landscape (*SOU 2001:38*; Emanuelsson 2011b).

Notwithstanding the draining of land for arable use, in overall terms the localisation of arable land has been assessed as rather stable since the 16th century (Hägerstrand 1988:20ff.). The acreage classed as arable land peaked at approximately 3.8 million hectares during the period from the 1920s to the 1950s (see Table 1; Swedish Board of Agriculture 2011). The expansion of the arable land area continued until the 1950's in northern Sweden and the Baltic island of Gotland, but ended earlier in southern parts of the country (Morell 2011b). Today, the area assessed as potentially reclaimable and the currently existing arable land area taken together amount to 10.1 % of the land area (approximately 4.1 million hectares, Swedish Board of Agriculture 2008, Table 1).

Boreal Landscape Change

Transferring land from one land cover type to another can be either radical and abrupt, such as in the case of forest clearance when a forest stand is 'replaced' by cropland (see cover photo), or more subtle such as in the case of abandoned cropland on which bushes and trees start to

[22] On this issue, Antonson & Larsson (2011) do not provide the reader with a final date when support to such initiatives stopped appearing as items in the national budget; it seems that these activities were financially supported by the state at least through the 1950's.

[23] The Penguin Dictionary of Geography defines the "*natural landscape [as] the landscape as unaffected by human activities, i.e. the physical landscape (including relief and natural vegetation) as opposed to the cultural landscape. But human activities have been so widespread that little 'natural landscape' thus defined still exists, and it can be said that nearly all landscape is now cultural; thus it is perhaps preferable to refer to the natural and cultural elements in the landscape*".

regrow. Where arable land has been taken out of production, this has mostly been due to afforestation or to a passive abandonment of the land, leading to forest regrowth. During the second half of the 20th century, the general impression was that of a continuously advancing loss of arable land (Jansson 2011a; Börjesson 2006), approximately 26% of what was cropland area in 1950 is today in other use (Statistics Sweden 2008). This loss of arable land has occurred in conjunction with a substantial decrease in the rural population and employment opportunities in agriculture, at the same time as there has been a large population increase, mainly occurring in urban areas (Jansson & Pettersson 2011). In other words, Sweden has experienced a dramatic redistribution of population from rural to urban areas. Today, sparsely populated rural land areas classed as rural periphery cover two thirds of the country (*SOU 2001:38* p. 64). This is naturally reflected in a dramatic drop by 75% in the number of agricultural enterprises during the 20th century (Flygare 2011a). Since the 1990s, the dynamics of rural land-use change have been "*more difficult to interpret*" (*SOU 2001:38* p. 43, my translation): for example, stabilization in the total area of grazing land has been reported for recent decades (Swedish Board of Agriculture 2011).

The counter movement of clearing forest land for arable use – while it does not, in the boreal context, represent a threat of similar magnitude as in tropical rainforest areas – is nevertheless a problematic issue in today's environmental debate on boreal ecosystem change, due to the loss of forest ecosystems, in terms of climate change and surface runoff, and because of risking to damage not-yet-documented historical relics in forests (Amér, pers. comm.; Ståhlberg, pers. comm.; Finnish Ministry of Agriculture and Forestry 2011; Kivimaa *et al* 2012; I also rely on Lehtonen, pers. comm.). The issue of land clearance, especially with regard to clearing organic peat mosses for arable use, is thus controversial. The seriousness of the issue is illustrated by the steering measures that have been proposed in Finland, which include excluding arable land on organic soils from agricultural subsidies, and prohibiting reclamation of organic soils (Kivimaa *et al* 2012).[24] In Sweden, there are no published statistics on forest clearance for agriculture for the period since 1950 (cf. Swedish Board of Agriculture 2011:27f.), while the farmer interviews conducted for this study suggest that land clearance continued on the ground after the 1950s. Recent documentation shows that forests are being cleared for arable use all over Sweden (Solbär 2011).

Figure 5. Various 'Opens' in a Landscape
An arable field (left), clearance lot (right), forest-felling lots in background.

The clear-cutting practices in modern forestry stand out as a parallel to the effects of forest clearance on land cover. Clear-cut forest land remains classified as forest land, but when subjected to this practice, defined as 'regeneration felling', the land abruptly changes into large open areas that persist for decades as

[24] Still, during the period 1995–2006 in Finland, about half of the acreage cleared for arable use was on peat soils, Kivimaa and colleagues suggest – even though, from the officially-stated national viewpoint, clearing as such is deemed unnecessary (there is no need for more arable land) and clearing areas of organic soils is regarded as non-desirable (Kivimaa *et al* 2012:36–41).

bald patches in the midst of forests (Fig. 5, Lisberg Jensen 2011; Bäckström 2011). Yet, it appears that the largest impact on forests is by road construction (both highways and forestry roads), according to an assessment of forest clearance during 2009–2012 (Solbär, in prep). Together with the land-cover effect of urban sprawl (Börjesson 2006), the expansion of the road network might represent the most significant on-going process of rural land use change (Solbär, in prep). Finally, land covers are also modified by shifts in management practices such as abandonment of forest grazing or the removal of landscape elements such as stone-walls, hedgerows, cairns or open ditches.

Land cover conversion is reflected in a shift from one tax category to another. Land clearance on a farm estate is likely to increase the value of the real estate, since the land use categories are evaluated based on the expected productivity of land (Bohlin & Prado 2011:117f.). During the 1990s and 2000s, the prices of arable land increased, and they are currently high in all parts of the country – although large differences exist between the south and the north of the country (Statistics Sweden 2012a; Johansson & Nilsson 2012).

During a five-year period, 1990–1995, a programme to free Swedish agriculture from subsidized production was in place (called in Swedish Omställning 90); it was interrupted by Sweden's accession to the European Union in 1995. The programme included support to take arable land out of production, a measure motivated by previous overproduction of especially cereals (Morell 2011c; *SOU 2001:38*). A farmer, also the secretary of a local office of the Swedish Farmers' Union, – referring to developments in land cover in his region during the 1990s – told me that on many farms, arable land was abandoned during the five years of the liberalisation program, and then, when Sweden joined the European Union in 1995, all land that could possibly be reclaimed was taken back into production, because the EU agricultural subsidies meant that arable use produced clearly higher returns than pulpwood.[25] Although it is only a limited example, this story indicates that policy may, in specific situations, exert a direct effect on land cover, not only in terms of the selection of crops, but in inducing shifts between open and 'closed' land.

In conjunction with this programme for the de-subsidisation of agriculture, the previously legislated maintenance requirement for arable land was relaxed (*SOU 2001:38* pp. 33, 91ff.). Since the 1970s regulations had been in place stipulating that existing arable fields should be maintained and properly managed, with field afforestation or other removal of arable land requiring prior permission from the authorities. This legislation was first softened, and then the management requirements were lifted completely in 1990/91 (*SOU 2001:38* pp. 33, 91). Today, management obligations concerning arable land exist according to the land use class of the land – i.e. whether the land is used for crops or pasture – and they are solely tied to the agricultural payment system. On cropland, the regulations stipulate that ploughing must be possible without special preparation, and that the land must be kept free from perennial regrowth and should have a sown crop; additionally, drainage is to be maintained to prevent fields from turning swampy (Swedish Board of Agriculture 2013a; Persson 2005:18; Lingegård 2005:17). Pastures and meadows must be kept free from perennial regrowth, and be grazed (pastures) or mowed and harvested (meadows) on an annual basis (Swedish Board of

[25] E-mail communication, June 2010.

Agriculture 2013a; Persson 2005:18; Lingegård 2005:17).

Due to the separation of farm payments from production in 2005 under the Common Agricultural Policy of the European Union, there was a rise in both the area under subsidized cultivation and the number of farmers applying, at least regionally and at least temporarily (Lundberg 2005; Umeflod, pers. comm.). In northern Sweden, a dramatic increase in the number of applicants and in the area applied for was recorded when the separation was implemented in 2005 (Lingegård 2005; Umeflod, pers. comm.).[26] Subsequently, this increase waned to some degree (Umeflod pers. comm.). For Skåne in southern Sweden, where several of the farms I have studied are located, there was similarly an increase of applicants from 2004 to 2005 (Trellman, pers. comm.).[27]

An official at the County Administrative Board of Norrbotten, the northernmost county in the country, describes in a farmers' journal how the new applicants included both previously non-eligible farms/farmers, and landholders who had taken back land from leaseholders in order to manage it themselves in a low-intensive manner (Lingegård 2005). The article asserts that the main reason for the rise in the number of applications is that, in contrast to the previous rules, no agricultural production is required from the land; it was enough to keep the land in an arable state Lingegård 2005). In other words, applicants without (plans for) agricultural production have now become eligible for farm payments (Trellman, pers. comm.). In addition, the system in place with payment entitlements was also a factor, as landholders were afraid of losing their entitlements to leaseholders and/or of falling outside the system (Trellman, pers. comm.).

Who Manages the Land?

Any rural landscape is comprised of socio-legal domains, distributing land rights among these domains, such as the farm estate in Sweden (Nyström & Tonell 2012). Here, private land ownership is the predominant mode of organising land use. Land ownership comes with extensive rights to use the land resources of the property owned; a landholder is also expected to take responsibility for necessary land management (Nyström & Tonell 2012:39; Jensen 2001; Jermsten 2001; Morell 2011a; Flygare 2011a; *SOU 2001:38* p. 27). It is the landholders, to whom Hägerstrand (1993) assigns terrain competence, meaning the qualification to dig the soil for gravel, to cut down and sell the trees, to till the land etc.

Historically speaking – i.e. since the late 19th century – the management of farms and land in Sweden has been organised in the form of family farming (Jansson & Wästfelt 2010:124f.; Flygare 2011a). The rationalisation and effectivisation programmes carried out since 1948 have accordingly targeted income improvements for the farmer (household), too (Morell 2011c).

[26] The number of applicants increased in 2005 by 67 % in the County of Västerbotten and 60 % in the County of Norrbotten compared to 2004; and the area applied for increased from 2004 to 2005 by 7 % in the County of Västerbotten and 10 % in the County of Norrbotten. The fields in question were mainly used for hay or lay fallow (Lingegård 2005:17).

[27] The number of applicants in Skåne, the southernmost county of Sweden (half of the land area of which can be counted as boreal) increased between 2004 and 2005 from approx. 9200 to approx. 11 000 (Trellman, pers. comm.). Concerning the areal increase, comparisons are difficult, Trellman maintains, as the agricultural payment scheme in place until 2004 and that in force from 2005 onwards are not fully comparable – under the old system, areal payments applied to cropland only, while the current farm payments apply to both cropland and pasture.

However, the effectivisation achieved in farming via investments in on-farm technology and in the land has led to increases in farm estate prices (Bohlin & Prado 2011:129). The family's position appears weakened, despite the rise in the values of landed properties. The farmer interviews indicate that arranging for a farm to be handed down in the family has become difficult and a source of concern, since buying out the other farm heirs, if there are any, or purchasing a farm on the open market, have become very expensive for an individual person.

The Swedish rural landscape is managed via private landed properties; many of the corporations, included in the group of rural landholders, are small, private and family-based Flygare (2011b). It is difficult to give concrete figures concerning the number of people managing the Swedish rural landscape, due to the categorization the accounting uses for ownership and use of rural estates. The main categories of farm estate ownership are individual owners, privately owned companies, other private and public corporations, and the state.

In 2008, 78.1% of the land area was distributed among 'farm estates' and covered by arable or forest lands including non-productive forest, 41.2% of the land area was managed under individual ownership, including estates after deceased persons (Statistics Sweden 2012b; my calculation, see Table 2). Rural land is owned under the term 'farm estate' – a unit that embraces at least c. two hectares of land; the farm estate category by definition excludes smaller landed properties, those comprising a house and a garden only. Only two thirds of 366,330 farm estates in 2007 were what are called built-up farm estates including a farmhouse (n=224,748, or 61%) (Statistics Sweden 2007); the non-built-up farm estates mostly contain forest land only (Flygare 2011a).

Table 2. Real Estate Taxation 2008.
Source: Statistics Sweden 2012b.

Land use classes (ha) on farm estates / *Ownership category*	Cropland 2008	Pasture 2008	Forest 2008	UnprodForest 2008	Total	% of land area	
Private persons	2522627	635698	10892877	2580114	16631316	40.5	
Estates after deceased	27116	7651	185650	63080	283497	0.7	**41.2 Private persons**
State	12927	9177	666950	1203430	1892484	4.6	
Municipalities, county councils	58283	18799	312386	59254	448722	1.1	
Church of Sweden	2806	576	29880	6839	40101	0.1	
Sw. companies	69883	32192	8788634	1893865	10784574	26.3	
Other legal persons	80496	22986	1431050	410168	1944700	4.7	**36.8 Corporations**
Unknown	4898	1482	28215	2802	37397	0.1	
All owner categories	2779036	728561	22335642	6219552	32062791	**78.1**	

While the farm estate comprises a legal unit, it can be owned by a varying number of private persons, or be in corporate ownership. The number of such units, *de facto* organising the management of the rural landscape, can be contrasted against the total population in Sweden that was 9,256,347 persons as of December 2008 (Statistics Sweden 2010b). The category of built-up farm estate can include second homes. A farm estate generally includes ownership of both cropland and forest land (*SOU 2001:38* p. 27); additional cropland might be managed on lease, which is often the case when the owner is running an agricultural enterprise (Morell 2011a). This means that farm ownership and practical involvement in

agricultural and forestry-related land use activities are not necessarily one and the same thing. Neither does the category 'farm estate' does not contain all farmhouses in a rural landscape; for example properties with parcelled-off farmhouses are not categorized as farm estates unless they contain more than two hectares of land – farmhouses are often parcelled off when agricultural land changes owners (Gunnarsson, interview).

Again, to specify concretely the number of agricultural enterprises that take care of the arable land in the country is difficult, due to the categories used in the published statistics on agricultural enterprises. It is not possible to distinguish enterprises managing only forest land from those managing both forest and arable land or those managing only arable land. This has been confirmed by Karlsson (pers. comm.). Additional difficulty arises from the fact that the category 'agricultural enterprise' embraces one-man enterprises and farm enterprises formed as agricultural companies, and includes gardening and greenhouse production (Swedish Board of Agriculture 2011). An agricultural enterprise can own several farm estates (Swedish Board of Agriculture 2011). The arable land is mainly owned by private persons, according to the Real Estate Taxation 2008 (Statistics Sweden 2012b, Table 2). In 2007, the number of agricultural enterprises managing forest and arable land was 72,609 (Agricultural Census 2007). Of the total, 43,389 enterprises (59.8%) managed more than 40 ha of cropland and at least 5 ha of forest, which are the next-smallest categories after the category zero (Note: pasture area is omitted in this statistic). These enterprises managed 2,979,691 ha of cropland and forest land, while the total of all agricultural enterprises managed 6,356,478 ha (Agricultural Census 2007). This means that only approximately one fifth of the land area distributed under the farm estates is managed by agricultural enterprises, indicating that land ownership focusing on agriculture as a way of living is held in a few hands only. Taken together the rural land use situation can be interpreted as indicating that agricultural enterprises manage several farm estates through a combination of ownership and leasehold. In this way, by leasing in or out, landholders either expand or reduce the area under their immediate responsibility. Lease agreements provide dynamics and flexibility in what, overall, is a stable ownership structure (Flygare 2011a:65).

Landscape Governance and Land Policy

Landholders with terrain competence over a single domain can be contrasted with the spatially competent authorities governing larger territories, such as municipal and county authorities or national sectorial authorities such as the Swedish Board of Agriculture or the Swedish Forest Agency (cf. Hägerstrand 1993:45-51). Binding international agreements such as the Common Agricultural Policy of the European Union or the trade regulations of the World Trade Organisation can be assigned to this category, in my interpretation, as all of these act in the 'abstract space' of spatial competence.

While the state regulates, imposes taxes and monitors land use (activities), at the kitchen table in the farmhouse or on the field a farm estate owner retains concrete space for free choice of action concerning farm and land management. Hägerstrand (1993:48f.) argues that the doings in households and working places such as farms/farm enterprises have room for negotiation of regulatory prescriptions, as there is a difference in competence – terrain competence vs. spatial competence – between landholders undertaking practical actions and the directives formulated on paper by officials in

the territorial hierarchy of government administration. Domon & Bouchard (2007) make in their study an observation concurrent with the observations developed by Hägerstrand in the idea of the two types of competence:

"As elsewhere, the agro-forested landscapes of [the study area] are not the result of deliberate landscape policies, but rather of the dominant types of occupation and land uses." (Domon & Bouchard 2007:1204)

National legislation is in the main enacted and administered by the sectorial authorities and via delegation to the County Administrative Boards (n=21), leading in practice to territorial variation in the implementation of the national legislation (as stated for example in *SOU 2001:38* p. 71). Further, in Sweden, municipal authorities hold a land-use planning monopoly (Nyström & Tonell 2012). As all of Sweden is divided into municipal territories, one might expect there to be municipal plans over rural land use. Yet, such planning is rare in Sweden, municipal planning activities mostly being directed towards the more populous and built-up areas, in which land-use interests might be more pressing and contested. Through a recent change in legislation, municipalities have lost their right of first refusal when farm estates are put up for sale (Gunnarsson, interview), which means that rural land might more seldom be tactically purchased by municipalities.

The Swedish state also represents public interests, and may give these precedence before private interests – such as ruling in favour of land expropriation for large infrastructure projects or nature protection. Despite the 'airy' character of the government's competence to initiate changes in land cover/use, it is important to revisit the relevant legislation to understand how it frames the single farmers' activities that will be discussed in this thesis.

Most regulatory power concerning the rather 'un-planned-for' rural land use emanates directly from national legislation on land acquisition (Land Acquisition Act, *SFS 1979:230*) and real property formation (Real Property Act, *SFS 1970:988*), and from government directives concerning productive land and the 'protection' of agriculture and forestry as local livelihoods (regulations concerning management of protected areas are excluded from this discussion). Additionally, economic policy (agricultural and forestry policies) and environmental regulations (the Environmental Code, Chapter 12) are important in steering farming as such. Further, to touch shortly on forestry policy: since 1903, the forest owner has been under the obligation to care for forest regrowth (Enander 2011). Through the forest policy revision in 1993, production and environmental objectives were assigned equal importance, and more responsibility for long-term sustainability was laid on the forest owner (Swedish Government 2012:13). A similar general trend is expressed in other aspects of land policy, too: the 'freedom' of single landholders has become more pronounced since the 1990s, as will become evident below. More recently, agriculture receives support for the provision of 'services' in environmental and regional development (*SOU 2001:38* pp. 34f.; Jansson 2011b; Emanuelsson 2011c).

Rural land policy has been geared towards keeping together farm estate ownership, the function of the farm as a place of living, and active land use (*SOU 2001:38* p. 32). The Land Acquisition Act concerns farm estate ownership; it aims at maintaining a balance between private and legal persons' land ownership, and at promoting living and working opportunities in peripheral rural areas (*SFS 1979:230*; Swedish Board of Agriculture 2013b). Typically, farm estate ownership is kept in the family; out of

what is anyway a low number of annual transactions (approximately 10 000 – 15 000 annual ownership changes among the roughly 325 000 'ownership units', which may contain several farm estates), about two thirds are intra-family (Morell 2011a).

The main goal of rural land policy since 1948 has been to foster the formation of farm estates with suitable size and distribution of land: a remade or newly formed farm estate should be able to fulfil its aim in the long term (*SOU 2001:38*; Gunnarsson, interview; Flygare 2011b). In the area of real property formation, from the 1950s to the 1980s rural land policy included programmes for improving farm structure, strengthening farms that were 'developed' or had the 'potential to be developed' (in Swedish: utvecklade, utvecklingsbara, *SOU 2001:38*, Gunnarsson, interview). This means that there was a push to rationalise farms in terms of their size and the distribution of land, with the procedures for exchanging lands or acquiring additional land being administered by regional agricultural boards (in Swedish: lantbruksnämnd). During the 1970s and 1980s, there was a whole range of regulatory interventions in place in the different areas of rural policy (Morell 2011c); for example, farm estate ownership was restricted to persons with documented education in farming (*SOU 2001:38* p. 60). From the 1990s onwards, more liberal land policies were implemented:

"Nowadays the state doesn't intervene actively in land politics; instead, the view is that it should be steered by the market" (Gunnarsson, interview, my translation);

"The state regarded the time to be ripe for handing over the responsibility to the farmers, enabling them to determine for themselves the design and management of their enterprises." (SOU 2001:38 p. 31, my translation).

Since 1990, acquisition of a farm estate is free to any private person (Flygare 2011b). Although newly established estates or estates formed by enlargement/parcelling off land should still 'suit their purpose' from a cadastral point of view, since the 1990s it has been possible to create smaller farm estates intended for 'hobby farming'; under the new rules, such farm units are no longer required to have full economic carrying capacity: it is sufficient if the farm estate provides some income to the landholder (*SOU 2001:38* pp. 34, 98ff.; Gunnarsson, interview). One stipulation that applies for all cadastral handling is that property formation, when including farm estate land, should be of benefit to agriculture as a local/regional livelihood, this can be seen against the trend of 'land ownership on distance' and separation of forestry-oriented and agriculture-oriented properties (*SOU 2001:38,* pp. 43ff.). The important cadastral judgement in each case concerns the development potential of the farm estate: for example, if the land, but not the farm buildings, were to be purchased by a neighbouring farmer, the cadastral focus would lie on the status of those buildings in terms of whether they could support a modern agricultural enterprise or not (Gunnarsson, interview).

The legislation concerning taking arable land out of production was amended in 1990. The Statute on Environmental Considerations in Agriculture (*SFS 1998:915*) now covers semi-natural pastures, too, as well as cropland and cultivated grazing land. An additional change is that now, a notification in advance is enough when planning the conversion of arable land to forest (or another use), whereas before, it was necessary to apply for permission (*SFS 1998:915*, *SJVFS 2006:17*). Notification is not necessary if the planned conversion is assessed, by the landholder, as being insignificant for the agricultural activities on the farm unit or for the

natural and cultural environment (*SFS 1998:915*, 3§). While consideration of wildlife and cultural values in agriculture is prescribed (*SJVFS 2006:17*) and occasionally implemented in practice such that the landholder may be required to exclude from afforestation an area containing an object of importance, e.g. an ancient monument (Johansson, pers. comm.), the authorities have no power to 'punish' landholders who actively or passively convert arable land to forest (Johansson, pers. comm.). The number of non-notified 'closings' is probably high (Helgesson, pers. comm.; Johansson, pers. comm.). Two examples: in Skåne in southern Sweden, the annual number of notifications in recent years has been 50–60, and often the land planned to be 'closed' is located in the 'mosaic landscape'[28] (Johansson, pers. comm.); in Västerbotten in northern Sweden, sixteen cases were reported in 2009 (Helgesson, pers. comm.).

Finally, when land use conversion goes the other way, from forestry to arable use, regulation is wanting. The only reference to land clearance is in the Prescription on the Consideration of Wildlife and Cultural values in Agriculture mentioned in the previous paragraph (*SJVFS 2006:17*), in which the Swedish Board of Agriculture states that land clearance may not be carried out if wildlife or cultural values would be damaged (12§). Land use conversion from forestry to arable has to date tended to pass through the administration without regulatory hindrances, precisely because it entails a transfer from one land use class to another: As the forest will not be 'recovered', i.e. replanted, in the event of land use conversion, the regulations applying to measures undertaken on forest land (or on fields) fail to have effect (Amér, pers. comm.; Ståhlberg, pers. comm.; Ringagård, pers. comm.). It can be noted from this and the example of forest clear-cutting mentioned earlier that the legislation is clearly concerned with categories, and not factual land covers.

[28] This landscape type extends diagonally from south-east to north-west through the north-eastern part of Skåne.

A.4 Empirical Material and Methodology

The research was initially directed towards empirically studying landscape change in a specific geographic area, thus conducting a regional case study; a parish landscape was therefore chosen. This approach was then due to field findings revised towards conducting single farm studies and towards grounding the understanding of the processes through which arable fields are created and maintained on the farm level. I have then extracted tendencies of landscape development from analysing land use decisions on farm level from a landscape perspective. This chapter provides a more detailed discussion of the empirical material, the methodology and the quality of this study.

Empirical Material

The empirical material consists of thirty-five exploratory farm studies, materials created during a 'study circle' with farmers, and expert interviews. The farm studies include landholder interviews that were carried out in person on the farms and landscape observations. The field documentation consisting of the verbal reports, original maps of different kind, field visits, and photographs were then reworked into a farm story and a farm land map, these procedures are discussed in the Methodology-section. In the table *'Farm References'* (in Appendix I), I give for each interview a brief description of the setting, in terms of participants (number and gender), the place, and the number of meetings in person besides telephone/e-mail contacts (with dates given); later I provide a short presentation of the interviewer (see *Gender and social relations in the field*). The table is sorted alphabetically by the farm codes, which are used throughout the main text. In some parts of the discussion in the main text I have omitted direct reference by farm code, for reasons of anonymity; this is mainly because the thesis contains several maps that might be locatable, despite the fact that I have kept the visual information presented on the maps very sparse due to this concern. Data on farm ownership has been derived from the public Real Property Register from 2009, and from the respondents. I have merged input from different persons participating in the same interview, meaning that the text presents a non-stratified view. A number of farms, referred to in the main text as *land use farms* (n=24[29]), derive from the regional case study first aimed-at. The goal here was to study land use change during the period 1990–2010. The *land use farms* are located in the central part of Skåne, the southern-most county of Sweden, with the majority belonging to one parish (n=23, the exception being the farm LUF 22) (Fig. 6).

The remaining farm studies focus on forest clearance for arable use, and conversely, these farms are referred to in the main text as *clearance farms* (n=11[30]). The *clearance farms* are located in three parts of Sweden, in open, mixed and forested landscapes with mainly fluvial and seabed sediments / formations, and to a lesser degree stratified tills, whereas the region in which the *land use farms* are located is

[29] When discussed individually the *land use farms* are indicated by the codes 'LUF 1' through to 'LUF 24' (sometimes in the discussion I omit the reference due to secrecy concerns).

[30] When discussed individually the *clearance farms* are indicated by the codes 'CF 1' through to 'CF 11'.

characterized by till with occasional fluvial and seabed sediments/formations in combination with boulders, stones, organic soils or steep reliefs. The latter kinds of landscape can be characterized as mosaic landscape, due to the mix of open and forested areas, but also due to the minor scale of these landscape elements, the shifting character (Fig. 7).

The sites of the *clearance farms* display larger continuous stretches of single land cover types. Several farms locate in predominantly open, smoothly undulating landscapes, lacking boulders and rocks. Such landscapes are located under the Highest Shoreline, displaying soils stratified by water movements and generally offer more favourable conditions for agriculture than soils based on glacial tills. On Gotland on several farms, the lands cleared are organic soils; here, extended campaigns to drain peat mosses were conducted during the 19th and 20th centuries (Kloth & Lovén 1987). A number of farms however locate in predominantly forested landscapes. All farms are placed in landscapes that share key traits with other Swedish landscapes and soils[31].

The *clearance farms* are agricultural enterprises run by a farm team (one or two owners, possibly employees during the growing season or all year round), with one part-time farm, the farm CF 7, as an exception. Accordingly, these farms manage considerable areas of arable land (Table A, Appendix I).The range of farms embraces various types of agriculture, with mixed arable and animal production (poultry or pigs and crops), arable production only, or dairy or beef cattle with hay. Although it was not my aim to establish a representative sample of farm types in the different areas of the country (see the section *Selection of farms,* below), the overall distribution of farm types in the empirical material is worth noting. All of those farms studied which only carry on arable production are located on the island of Gotland in the Baltic Sea (Fig. 6; Gotland is also a county). Agriculture on Gotland includes cropping, especially growing vegetables, and animal husbandry (Swedish Board of Agriculture 2011).

Figure 6. Location of Farms Studied.
The location of 23 of the *land use farms* is indicated by a box.

[31] See for example the National Atlas of Sweden, http://www.sna.se/e_index.html, for an overview of Swedish geography.

Amongst the farms visited on Gotland is also a mixed farm, and amongst the farmer contacts not visited there is a large-scale dairy farm where the farmer also carries out forest clearance.

All the farms visited in Västerbotten in Northern Sweden are farms with cattle. In Västerbotten a large proportion of arable production has long been hay, and the proportion of beef cattle in the total of all bovine livestock is the lowest in Sweden (Swedish Board of Agriculture 2011) – indicating that dairy production is relatively important in this county. The farms selected reflect the dominance of animal production in this region. That said, amongst the respondents here is a strawberry farmer, who explained that he had extended the existing 3 ha of strawberry fields by clearing a number of hectares of adjacent forest land. Forest clearance for arable use has been documented, in all parts of Sweden (Solbär 2011).

Amongst the *land use farms,* three farms are run as full-time enterprises with cattle (dairy or beef) and hay[32]; one farm has mixed farm income from animal husbandry (beef cattle) and nature/culture tourism[33]; seven farms are run part-time or as a hobby[34] ; and twelve farmers lease out the major part of their arable land[35]. The agricultural production on the part-time/hobby farms consists of hay, on some of the farms together with oats or barley. Those respondents who lease out arable land said that it is used for hay.

Figure 7. Mosaic Landscape, *land use farms*

Cattle are kept on six of these nineteen farms, and on one sheep are kept. The *clearance farms* are in the main larger than the *land use farms*, all of them are family-based farms, passed down from generation to generation but for one, whose owners come from the region.

Prior to fieldwork, I was able to engage two superficially familiar farmers to act as pilot cases for my preparation. These visits provided me with farm-level orientation and contact with the farmer discourse, and helped me in developing the observational guide for the *land use farm* visits. I can also add that at two of the farms I visited I was not able to carry out a structured interview, as the landholder, for reasons I can only speculate on, would not agree to a systematic interview on land use on the farm. The large majority of farm visits were 'successful'.

[32] Farms LUF 21, LUF 23, LUF 8.

[33] Farm LUF 22.

[34] Farms LUF 10, LUF 13, LUF 6, LUF 9, LUF 7, LUF 19, LUF 5. I have chosen to group part-time and hobby farming together, as I have not followed any established categorization of workload or income to classify the farms. The only dividing line is thus whether at least one person is engaged full-time on the farm. My reason for adopting this criterion is that persons involved in full-time farming for their livelihood might be expected to have different views on the organisation of farming (as suggested by previous studies).

[35] Farms LUF 20, LUF 15, LUF 17, LUF 4, LUF 12, LUF 14, LUF 3, LUF 16, LUF 2, LUF 18, LUF 1, LUF 11.

Selection of Farms

The *land use farms* were selected from the cluster of farm estates in the selected region based on data in the public real property database (the Real Property Register, accessed in November 2009); the selection criteria was that the farm had been included in a 1992 study on land use changes during 1930–1990[36]. I have interviewed the landholder in all cases. In addition, as already touched upon contact was made with additional landholders whereof ten provided brief information over the phone, three declined participation, while one farm visit has been excluded.

The developing evaluation of the interview study motivated the selection of additional farm estates on theoretical sampling basis; on these farm estates either a shift in ownership had occurred, in 1990 (n=3) or in 1993 (n=2); or there was an ownership discontinuity between 1992 and 2005 (n=1, the farmer offered to participate, however). Stenseke (1997) highlights in her study that land use changes may occur more often when there is a shift in ownership. In sum, I have interviewed seventeen farmers already interviewed in 1992 (whereof six had been interviewed by phone), and six farmers whose farm estate was included in 1992. Additionally I visited one farm for a farmer interview with the same landscape type as the majority of the *land use farms*; this farm was selected because of its mixed farm income. As a whole, the twenty-four *land use farms* make up a heterogeneous group highlighting different situations in terms of age and non-farming income versus full-time engagement in farming.

The choice of the *clearance farms* was effected using the ad hoc selection criterion, 'land clearance for agriculture'. This criterion reflects my goal of finding clearance cases without any further specification of characteristics. I obtained contact information on landholders reportedly engaged in land clearance from a query[37] addressed to, and additional later contacts with, county administrative boards and local and regional associations of the Federation of Swedish Farmers (Swedish: Lantbrukarnas Riksförbund, LRF). At a later stage, while I was doing fieldwork, publicly available national data on forest clearance for agricultural purposes offered concrete ideas as to where to find clearance cases. I was also present during an interview aiming at a newspaper reportage concerning forest clearance of two farmers by a reporter and photographer (where I was permitted to tape-record the main parts of the conversation).

In all, I visited thirty-nine farms during the period 2009–2011, and talked to nineteen additional farmers by telephone during the selection of the thirty-five farm cases. Some farmers contacted suggested that there was not so much to discuss (on the grounds of their retirement), in other cases a visit to the farm was practically impossible during the fieldwork period. Some farmers clearing forest declined as they would not have much to show: either 'it' was not ready yet, or 'it' was already finished (and not visible any more). I did however collect the short notes on the land use on these farms based on the phone conversations with the exemption of those three farmers who explicitly declined participation, and have included the information provided as data on grazing and lease relationships when relevant (n=10 farms).

[36] The selection criterion in the 1992 study was a farm estate managing more than 10 ha of land (Stenseke 1994, 1997).

[37] Prior to sending out the query I roughly excluded regions that had suffered worst from the severe storm in January 2005 which felled substantial amounts of forest.

Both the more homogeneous character of *clearance farms* and the more heterogeneous character of *land use farms* reflect the targeted populations. Farms engaged in forest clearance can be expected to engage in agriculture, whereas a selection aiming at covering a section of landscape can be expected to provide a variety of farm types. These differences between the *land use* and *clearance farms* derive from the fact that the former were all chosen from one region and from a group of landholders that had already been interviewed before, in 1992 – this means that the farmers' life cycle plays a part. Several landholders in this group receive retirement pension; where farming is continued to some degree these farms are listed above under part-time or hobby farms. Additionally, the selection criteria have resulted in the *clearance farms* having a more homogeneous character that contrasts with the more heterogeneous character of *land use farms.* The table *Farm references* in Appendix I shows the duration of farm ownership and other data concerning the farms. I explain the table in the next section.

The contact persons at the county administrative boards and the Federation of Swedish Farmers may, when answering my inquiry, have picked 'spectacular' clearings, i.e. cases with forest being cleared for cropland. This might explain the systematic bias in the empirical material – in other words, the sampling frame may have generated a selection with a specific tendency (cf. Denscombe 2009:41). The clearance projects included in my study target cropland with few exceptions, whereas an analysis of national statistics on clearance notifications shows that forest land cleared for agricultural use is mostly used for pasture (85% of the notified area during 2009–2010 was for pasture (Solbär 2011); decreasing in 2011 to 80% of the total that was cleared for agricultural use (Solbär, unpublished)[38]. Additionally, during 2009–2010, the mean size of parcels notified for clearance was 2.73 ha (median 1.7 ha, SD = 3.81, 50% 1.0–3.1 ha). Several of the clearings studied here cover an area larger than the national mean for 2009–2010, which supports the interpretation that officials may have chosen 'spectacularity'; however, sizes near the mean exist in the material, too.

It is likely that the systematic bias derives from the ad hoc selection process and the contact persons' unarticulated choices. It would therefore not be valid to attempt to explain forest clearance for agricultural purposes solely based on the farms included. That said, the selection is, I would suggest, suitable for studying clearance as an activity as such, as well as for shedding light on the reasons for contemporary land clearance. The empirical material contains different farm situations in which parcels are being cleared, and offers a good point of departure for this study and for further assessments.

To conclude the section I provide information on how landholders were contacted prior to their agreeing on participation. Information on the research project was sent by post to selected landholders together with an invitation to participate and information on anonymity and the possibility to discontinue participation at any time, following which I got in touch by phone to enquire about their willingness to participate. By explicitly referring to the previous study from 1992 on land use changes in the parish, my

[38] The data is reliable and can be assumed to cover the majority of land use conversions in Sweden from forest to other land use, especially since 2010 (cf. Solbär 2011).

study was presented as a follow-up, and this can be seen as having functioned as an *"authorizing bridge"* (Reinharz 2011) granting renewed access to the field. There is written documentation of these participants' agreement to take part in the study. The farm LUF 22 was contacted directly by phone, with all information provided on that occasion (the reason for contacting this farm was the mixed farm income). For *clearance farm* interviews, information on the objectives of the research and the terms of participation was provided orally, either spontaneously or via the telephone, and informed consent was obtained likewise orally. The latter landholders were invited according to their own decision to request economic compensation for the time expenditure for the interview and guidance in field from the University.

Farm Visits

The *land use farms* were visited during spring and summer 2010, and summer 2011 (LUF 22, LUF 24), on day trips. The *clearance farms* were visited during three fieldwork periods in June 2011, July 2011, and August 2011. Thereof four farmer contacts were in fact renewed by the field visit as I had conducted telephone interviews with them previously while preparing a report on recent land clearance in Sweden (Solbär 2011); for all interview dates including the telephone interviews, see Table *Interviewees and Experts* (Appendix II). The renewed contacts allowed me to observe the farm sites, and to gain deeper insight into the background of the clearance projects, providing more details and enabling me to map phenomena difficult to capture over the telephone. A number of interview sessions were also held with LUF 21 of which only the first regular interview was taped, while the others aimed at obtaining detailed information on tilling practices.

The interviews lasted for 1.5 hours, with some shorter or longer interviews. In some cases, the interview was wholly conducted during the field visit. The *land use farm* interviews were documented by tape recording (n=22, two *land use farm* interviews rely on notes due to technical problems; the recordings have been handed out on cd). The *land use farm* interviews were held on the farms without field visits; the farm lands and natural places were instead discussed in detail with reference to the cadastral map. The *clearance farm* interviews were documented by taking notes during the interview/field visit and/or by taping. Tape recording was inappropriate in several situations; it either felt too formalized or misplaced outdoors or during car/tractor rides. The farm story and the farm land map were sent to the respective landholder for checking and the addition of any supplementary information; in most cases a follow-up phone call was possible to collect their reactions. Respondent validation however mainly fulfilled the function of informing the interviewees as to what I 'knew' about them and their farms, as the interviewees mostly acknowledged the text/map as correct with only rare corrections being made.

Photographs showing the status of the clearing and its surroundings as well as any implements utilized in clearance projects were taken with permission from the landholder; these photographs functioned as 'visual notes' that complemented the written notes.

Some concluding remarks concern my methodological experiences with interviewing and farm visits. As researcher, I visited the respondents' daily lives and surroundings, and flexibility was necessary in order to adjust at the situation at hand. Given this, my aim was to cultivate an attitude of interest and positive curiosity in my role as researcher/interviewer. Each farm visit provided information some of

which I was not expressly seeking, such as biographical detail and situational observations; the visit and the stories told had an emotional as well as a factual dimension. This necessary side effect results from the attempt to understand, as in this case, both objectives (land cover) and existentialities (the farmer's situation). The post-fieldwork taught me that interviewing has a double nature; interviewing allows for discoveries and insights into 'novel' aspects of the phenomena being studied – which is what qualitative interview work fundamentally is all about, while at the same time, too much information is necessarily 'caught in the net'. The qualitative approach generated information that had to be analytically removed after fieldwork by applying a more concise focus and filtering out what had to be categorized as non-relevant things. I have also sought to tackle the emotional and experiential dimensions of my fieldwork by writing down reflections on any impressions received during the visits. When utilizing the survey mode of inquiry, the focus is set more sharply prior to contacts with respondents, at strategy that delimitates the possibility of recording not-thought-of field observations.

Interview Contents

The main sources of empirical material for this study are observations of farm land and interviews with landholders. The farmer interviews utilized a semi-structured interview technique. A semi-structured interview focuses on a chosen topic and follows a list of points to be covered, but allows for flexibility to accommodate issues which arise during the course of the conversation (Valentine 2005; Yin 2009:106). In preparation, I tested an interview guide in two pilot interviews, and then revised the questions. I found it necessary first to establish concrete facts before inquiring into the meanings perceived in the situation at hand. In other words, the ingredients in each farm 'case/situation' had to be explored 'first', a process that was assisted, yet only roughly matched, by the pre-formulated questions. The result here was that the survey part brought out general data on the farm in question. This is understandable from the general point of view speaking as by pre-formulation responses tend to incidental answers (cf. Valentine 2005). The open conversations were the means of systematically re-connecting land use/clearings with land use/clearance motives, such that goals, activities and places were tied together during the interview and the field visit as consistently as possible. Most prominent among such were neighbourhood issues, the recurring appearance of wild boars (which I included), plans for wind power developments (which I excluded), or the differing land management style of *"the EU farmers"* (farmer interview) since 2005 (included). Neighbourhood issues could not be dealt with systematically; however, I include in the discussion of findings some aspects pointing out directions in which further research might be rewarding.

A *land use farm* interview covered the current situation on the farm and any land use changes during 1990 – 2010 in retrospect, and consisted analytically speaking of two parts: the first encompassed a structured survey (cf. Denscombe 2009:26; Yin 2009:108), i.e. an observation of land cover on the farm using maps, field observations and the discussion with the farmer to cover crops, farm animals, types of farm-based production and land cover (for the Observational Guide & Survey, see Appendix III). The second part of the interview embraced a semi-structured conversation touching on the reasons underlying the present land use, farm ownership and management, and the other aspects brought up during the first part (for the

interview guide, see Appendix II). I have decided to fully rely on the farmers' accounts as correct, and have not attempted any checks of their oral reports.[39] In short, the interviews aimed to find out what farmers thought about their land and their farms. Taken together, the *land use farm* interviews sought to cover the *farm project*.

In the *clearance farm* cases, the focus was on the clearings at the farm and their specific background with the objective of learning which parcels were cleared and why, in what situations and for what reasons – in short, the topic was the clearance project. The overall farm situation was covered summarily and according to what appeared relevant to understanding the clearance projects (for the Observational Guide, see Appendix IV). Thus the interviews targeted connections between the clearance activities and other activities or plans concerning farm management.

The *clearance farm* studies were intensive field studies focusing on an on-going, contemporary and clearly delimited phenomenon by which the interviews were anchored – i.e. the clearings. Intentional land use changes of the kind as a forest clearance project must be regarded as thoroughly assessed in advance by the farmer due to the long-term engagement such a project requires. Farmers told me of calculations or plans they had nurtured for a long time. It can be expected that explanations and reflections offered during the interview are largely grounded in previously established reasoning; however, due to the generally relational character of interviews, it may well be that some aspects of interest were not mentioned. I would nevertheless suggest that field visits and recurrent contacts have at least partially addressed this problem, in that via my specific observations of individual clearings and farms I gained more knowledge about important factors concerning clearings and farms in general (I return to this aspect further, below).

Complementary Sources of Information

The primary sources of information for this thesis are farm studies. Additional primary sources of information are expert interviews and a series of landholder meetings, both of which are detailed below. As secondary sources of information directly relating to the *land use farms*, I have used data on land ownership from the public Real Property Register of the Swedish Mapping, Cadastral and Land Registration Authority, and farm-specific research notes by Stenseke from her 1992 study on reasons for land use and landscape element changes between 1930 and 1990 (Stenseke, 1994, 1997). The research notes for each farm estate contain information on farm size, land use distribution (forest, pasture and cropland), ownership, production, work input and land use changes[40], and additionally, a few words on plans. The research notes were discussed with the respective interviewee and functioned as an important 'anchor' during the interview.

As secondary materials relating to the *clearance farms* I utilized the Parcel Maps produced by the Swedish Farm Payments Administration (see *Maps and notations*). In some cases, various supplementary materials were made available, such as forestry plans produced by forestry companies or copies of an official document produced by the national agricultural

[39] This was in part due to the fact that aerial photographs only exist for the years 1978/81, 1984/85, 1999/2002, 2004, and 2007 (the area is usually covered by four photographs, not always taken the same year).

[40] Unfortunately, there are no maps showing the geographic specification of the sites that had changed.

administration to detail the farm's arable parcels as to their size and status including the season's choice of crop.

Two participating farmers agreed to take on the task of noting the time consumption and locations of their daily activities, but in the event were unable to combine taking notes with the time demands of running a farm, despite my attempt to provide a simple, partially pre-filled diary. I rely instead on Hagenvall & Gunnarsson (2008) as well as a farmers' internet forum for data concerning the time expenditure of tilling activities per hectare.[41] An assessment of time usage was sought in one or two cases in order to support the process perspective of the study. Yet a proper assessment can only rely on time use diaries as, in the case of land use and farming activities, the route determines the time usage together with the length of the (working) day that at least during the growing season varies. I have instead worked with assumptions concerning time usage to support the discussion.

In addition, I have derived statistical data on land-use types, arable production, farm animals and agricultural enterprises for the whole parish, in which the *land use farms* are located for 1951, 1961, 1971 and 1981; 1990-1995; 1999, 2003, 2005, 2007 and 2009 (Statistics Sweden 2010c), as well as for the population for 1981, 1990, 1995, 1999 (Statistics Sweden 2011), which data have been re-worked, put in one digital file and analysed.

[41]http://www.bukefalos.com/f/archive/index.php/t-1144435.html, accessed 04.02.2013. The whole quote in Swedish can be found under Personal Communications.

'Study circle' with Landholders

In spring 2011, I arranged a 'study circle' with landholders I had interviewed, set up as a forum for discussing the research project's findings with participating farmers one year after the interviews had taken place. All respondents from the *land use farms* studied were invited to participate in the study circle. A study circle is a common way to organise leisure-time studies in Sweden and functioned essentially as a focus group. For the design of the 'study circle', I referred to Wibeck (2010) and Conradson (2005) on focus group discussions. Focus groups aim at gaining deeper insights into attitudes and perceptions, and give opportunity to receive feedback on research findings (Conradson 2005). There were issues in this case that I felt were 'problematic' – namely the dominance of hay on arable land, and the frequent use of 'economic viability/profitability' as a label at which the interlocutor was expected to nod understandingly (although it did not say very much about what was meant by the terms 'profitable' or 'non-profitable'). Finally, I wished to communicate and invite response on my preliminary results regarding land use and theoretical concepts I had formulated, while taking the opportunity to give something back to the research participants (some coffee and cake!).

The meetings were designed as informative social occasions; only to a lesser degree were the sessions envisaged as occasions to derive new data. To keep the atmosphere informal, tape recording or taking notes was not practice, but individually and collectively created materials were collected. The latter double approach was in order to allow a breadth of individual meanings to be established before group consensus could reduce the nuances. An example of the group situation selecting 'opinions' was when we discussed crop choice in the region:

motives connected to on-going production had 'more say', i.e. were taken as weightier arguments, than views that were retrospect. I offered a series of three sessions, with each session held on two different occasions in order to facilitate a good group size and give the participants two possible dates. The session themes were *Land, Farms, and Economic viability.* In total, twenty-three landholders representing sixteen farms participated in one, two or all three meetings[42]. The meetings were held in the parish meeting hall (owned by the local congregation of the Church of Sweden).

The first session, on *Land,* produced a ranking of statements generated by me relating to the question of hay in the parish (for designing ranking exercises I utilized Hawkins 2004). The rankings were done first individually (each participant noted her/his ranks on a form with the statements) and then groupwise (the participants self-organised into groups, each of which task was to agree on how to rank the statements). When individual answers concerning the relevance of statements were in desagreement, which points at the different perspectives participants had on land use, the dividing line was often between retired and 'active' farmers. The statements ranked as truest were far less controversial when individually assessed than several statements that received scattered rankings (for the list of statements and ranking results, see Appendix VI). The second session, on *Farms,* contained my presentation of the material compiled from the first meeting on *Why hay?*, and of animal husbandry data for the farms studied during 1990–2010. The third session, on *Economic viability* (In Swedish: lönsamhet, which can also translate as profitability), focused on the meaning of the term 'economic viability' in general and in the context of the participants' farms. A set of pre-listed strategies for enhancing economic viability was assessed individually (derived from study materials from the Federation of Swedish Farmers) by indicating strategies that the farmers had applied on their own farm[43]. After the individual part, the findings were gathered together on large sheets of paper for further discussion. This session uncovered a range of meanings of the term 'economic viability' among the farmers attending.

The most successful aspect of the group sessions was when viewpoints that arose were put to discussion by other participants. This constructive airing of differing views was enabled by the fact that the participants shared a base of regionally relevant knowledge (albeit with individual takes on 'reality'). These discussions were illuminating for me, and after each session, I both made notes on the session content and reflected over my steering of the group process. Some interesting discussions remained undocumented in their exact wording but enabled me to take home a broader understanding of the topics.

[42] Including three landowners from two farms who had not participated in an interview: a couple invited by an interviewee, and a contact person living just outside the parish area. The groups were not constant over time: on the first occasion of the land session thirteen persons participated, and on the second occasion eight persons; on the first date of the farms session seven persons participated, while on the second occasion eight persons attended; and on the first occasion of the economic viability session ten persons were present, while on the second date eight persons came.

[43] The list included the following: increasing the labour input; increasing production; discontinuing a particular kind of production, and in that case, which?; starting a new business, and in that case, which?; increasing the efficiency of farm management; entering into co-operation with other landowners; other strategies (if so, describe them)?

Expert Interviews

Interviews with 'experts' have provided information on specific land use issues (as specified in the table *Farm references* in Appendix I). The first of these interviews was held with a property rights expert at the Swedish Mapping, Cadastral and Land Registration Authority (in Swedish: *Lantmäteriet*). The interview (tape-recorded, transcribed and respondent-validated, cited as Gunnarsson, interview) covers rural land policy, especially the farm structure amendments 1970–1980 and the more liberal policies since 1990, and governmental regulations concerning rural landed property, more specifically the guidelines for landed property formation and the parcelling out of second homes and 'horse farms' (typically a small farm). The interview further covered cadastral perspectives on new activities in rural spaces, such as golf courses, hunting, and public access issues such as riding tracks. Secondly, with a retailer of agricultural machinery I discussed purchases of crushers and other equipment used specifically in clearance projects (EXP 2). Further, I discussed land clearance with two farmer-and-son pairs who specialized in offering clearance services on contract (EXP 1, EXP 3). During these interviews, notes were taken and implements at display were documented.

Maps and Notations

Maps and mapping have played an important part as orientation and analytic tools in this study. For visualizing cartographic techniques, I have followed Brodersen (2002) and Dent (1999). For abstract situational mapping as an analytic tool, I have followed Clarke (2005). Prior to the *land use farm* interviews, I obtained a colour copy of the respective property map from the Index Map in the Real Property Register. This map framed and anchored the conversation, together with notes from 1992 (see *Complementary sources*). In the *clearance farm* interviews, I used 'parcel-maps' produced by the Swedish Farm Payments Administration together with other maps such as forestry plans or drainage plans made available by the farmers, and illustrative sketches produced during the interview. These Parcel Maps depict managed parcels against the background of a colour aerial photograph with a high level of detail (scale 1:5000). The maps show parcels managed by the specified farmer during the specific season (including both owned and officially leased land), based on the application the farmer has handed in (this represents in fact an agreement between the administration and the farmer as to the choice of crop or management-type on parcels during the season). Based on digital geographic information from the Swedish Mapping, Cadastral and Land Registration Authority and the data obtained during the interview, I have produced farm land maps and a number of landscape maps with the OCAD Professional map drawing software. These maps visualize managed land (the spatial shape of the farm). All data collected on the farms applies to one specific season close to the occasion of the interview – in most cases spring / summer 2010, alternatively summer / autumn 2011. My maps are sparse and focus on locational details, for reasons of anonymity.

Alongside mapping, I have made use of the time-geographic notation technique. The key principle here is to provide a protocol of simultaneity and sequence pertaining to the phenomena being researched (see Hägerstrand 1974, in Hägerstrand 2009 conceptualised as '*side-by-side-ness*' and '*before-and-after-ness*' (translation Ellegård & Svedin 2012; cf. Ellegård 1999; Gren 2009):

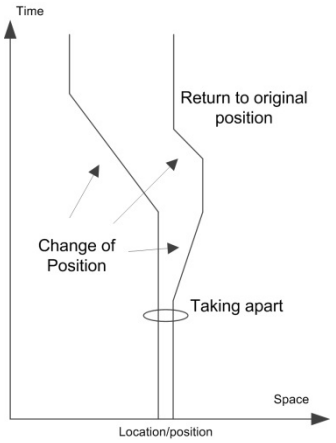

Figure 8. Time-Geographic Notation.
After Gren (2009) and Hägerstrand (2009)

In a two-dimensional drawing (Fig. 8), time is presented on the y-axis advancing from the origin (set at start-time) upwards as units of time pass. The x-axis is used to depict spatial properties.

Methodology

The study has been conducted as an exploratory, qualitative investigation into the practice of farming at the background of arable fields including the farm-contexts that make farming possible in order to develop our knowledge of land-cover processes, farming practice, and farmer decision-making from the point of view of land cover change. The study is thus no ethnography of farming, or an attempt to understand farmers' lifeworlds from solely their own viewpoints. The study attempts to understand the role of materiality and corporeality in farming and in bringing about land cover processes. In this, I have relied on the idea of critical hermeneutics that I discuss in more depth below (see section Theoretical Sampling and Critical Interpretation). This approach has entailed finding an approbriate methodology for grasping objective realities and farmer situations, and the development of my understanding of the farmers' understandings. The latter comprises the traditional focus in a qualitative inquiry directed at understanding the lifeworld of interviewees (Hartman 2004). A qualitative inquiry often alternates between empirical analysis and conceptualisation, guided by the problem posed at the beginning of the investigation (Hartman 2004). Corbin and Strauss (2008) highlight this in the following way:

"It is important to keep in mind that if a researcher knew all the relevant variables and relationships in data ahead of time, there would be no need to do a qualitative study" (Corbin & Strauss 2008:57).

I found it fruitful to approach land use from two angles: via the observations of the land itself and via an interpretation of the 'when and why' underlying concrete doings, i.e. the farmers' land use decisions. The phenomenon studied, farmers' relation to land, in itself cannot be observed directly; my observations could be said to concern traces on the land of this relation and the conversations with respondents were consequently 'about' this relation, conveying either retrospective or reflective statements, deriving from a meta-level. This means that interpretation is the main method utilized to extract information in this study. In what follows I detail on aspects of the fieldwork and the reworking of the materials, and explain how I went about to interpret those materials by utilizing theoretical sampling and critical interpretation.

Fieldwork

Fieldwork is often undertaken based on the assumption that the field is located 'somewhere else' spatially speaking (Massey 2003), which is the case in this study. Geographical separation between the field and the researcher's office does by no way automatically grant attainment of

new outlooks on things by a shifting of position in one way or other. An important argument is that the field 'ought' to be somewhere else mentally, too, in order to enable new understandings to develop compared to the previous position of the researcher – i.e. the fieldwork might and/or should influence the researcher (Whatmore 2003). One might think of the combination of researcher and field, which is specific for each research project, as the vehicle in a qualitative study that ought to bring out the desired contribution to the research field in question.

Fieldwork is influenced by the situated character of any research ('situated knowledges', cf. Haraway 1988), in this case, of an empirical inquiry based on farm studies that relies to an important extent on interviews. Interviews can be taken to generate relational and situation-bound meanings (Kvale 2007; Valentine 2005) as they rely on an interactive relationship between researcher / interviewer and interviewee; here, data are so to speak co-constructed during the interaction (Cloke *et al* 2004; Corbin & Strauss 2008:31; Whatmore 2003:93). The interview method (semi-structured or open) therefore produces no 'truths' but offers a possibility to gain "*insights into what people do and think*" (Longhurst 2009:583). The truth-value (quality) of a qualitative study depends on its ability to produce "*trustworthy, believable*" (Corbin & Strauss 2008:303) accounts that "*resonate with readers' and participants' life experiences*" (Corbin & Strauss 2008:303). I return to discuss these aspects in the section Quality of the Study.

The contact with participants was primarily steered by the communication of the research intentions and the on-going evaluation of the interview situation; the notion of co-construction is appropriate to the quality of the interview situations in themselves. Co-construction of evidence applies particularly to the less structured part of the interviews that concerned the meanings that the farm and the land held for the respondent. During the interviews, artefacts such as maps or clearance-related implements played an important role for stabilizing and concretizing the conversation. And, the possibility to observe the progress of on-going clearance projects during field visits recurrently opened up new aspects or details that were important to understanding land clearance in each specific case. In this sense, fields in themselves functioned as anchoring artefacts. Both Setten (2002) and Riley & Harvey (2007) maintain that in-field walks can facilitate a deeper understanding of land use, and the latter also touch upon the use of artefacts during interviews, similarly to Gaube and colleagues (2009). When one is emerged in the landscape setting, potentially new views may open up:

"The dynamic nature of interviewing [outdoors on the land] opened up space for more incidental paths to be followed as interviews developed and literally processed/proceeded around the farm" (Riley & Harvey 2007:396).

Besides the field visits on the *clearance farms*, I attempted to adopt this mode of inquiry during the examination of the farm land as shown on the cadastral map in the *land use farm* study.

An additional aspect, which pertains to interviews, and stems from the situated-ness of both interviewer and interviewee, is the encounter with unfamiliar meanings. Kögler (1996) suggests that this kind of encounter distances both interviewer and interviewee from preconceptions, which they have hitherto taken for granted, thus making it possible for these preconceptions to be made a subject for dialogue. During the interviews, reflective moments were introduced in various ways: by follow-up questions, by presenting tentative

interpretations to interviewees, and by attempting to question what was presented as self-evident.

Reworking the Material

As has already been indicated, the phenomenon studied was 'observed' indirectly. The reworking has consisted in interpreting a variety of reconstructions of what it is to be a farmer in relation to land. The analytical engagement with the material started during the farm visit, when observing and listening, due to immediate impressions and a 'direct' understanding of the matter at hand. These impressions then accumulated with each visit: the bits and pieces of information started to mesh into a whole to borrow Reinharz' (2011) formulation: "*All the ideas and experiences people shared with me began to mesh into a large whole*" (Reinharz 2011:12). This means that before the beginning of any systematic work with the materials, an impression of the 'thing' already emerged, like a 'picture of reality'. The reworking then meant a different and new encounter with the material.

During the reworking of the material, I relied on Corbin & Strauss (2008), Clarke (2005) and Crang (2005) for the basic reworking of empirical material by meaning condensation and the use of memos, tables and charts, and on Eräsaari (2007) and Häikiö & Niemenmaa (2007) for guidelines on working out aspects of relevance in the material. While for Corbin & Strauss (2008) and Clarke (2005) such reworking constitutes part of a 'grounded theory' -approach, Crang (2005) regards of these procedures as something that is effected prior to the choice of analytical method. I started by preparing the farm land map and the farm story based on field documentation. This phase was about describing the *farm project*. In writing the farm story, I strived to create a coherent account of the information I had gained during the farm visit. This procedure followed the principle of condensing meaning and converting the conversation in prose; thematic passages in the interview were formulated shorter, but keeping characteristic expressions, or quotes from the interviewee's narrative. Later in this reworking, I utilized coding of meanings, applying codes such as identity, inheritance, and investment which came to figure as the most prominent ones, together with codes such as living environment, interest, invasion, in order to describe what the interviewee expressed concerning the farm (land). I thus selected statements that indicated goals and ends, then proceeding to thinking about the many values perceived in the land. This analysis of 'meanings' was in three cases redone approximately one year after the initial coding. Without having revisited the first coding of themes in advance, the renewed coding resulted in almost the same formulations. I took this to indicate that the judgement of relevance was sustained in its orientation throughout the research process. Arguably, it was during this condensing and coding that I as researcher made choices of interpretations. In a qualitative study, there always remains scope for another interpretative framing of data during the analytical engagement with it as the pre-knowledge of the analyst affects the analysis and this knowledge in itself is extended during the analytical engagement (Corbin & Strauss 2008:301f.; Hartman 2004:271ff.). At the same time, the reworking of qualitative material represents an individual way of making sense of it in order to facilitate understanding (cf. Corbin & Strauss 2008:57ff.). In the case of my study, the coding helped me to see the importance of 'orientation' and 'commitment' as forces in land use decisions, and led to the development of these ideas in the theoretical framing of the study. Finally, I have made detailed enumerations and tabulations of the kind that

are presented in Part B of the emerging main aspects in the material.

This reworking procedure was different in the case of the *clearance farms* with their focus on the *clearance project*. The difference derived from these interviews being focused on various, often tangible aspects of the clearings rather than attempting to understand aspects of the lifeworld of the interviewee, putting the various informations together to a picture of why the particular parcel of land was cleared (although there are *clearance farm* cases that made me wonder about the whole farm project). The range of available materials varied per farm and was generally broader in these cases, including the detailed 'parcel-maps', photographs (functioning as visual notes), field notes, sketches, yet at the same time in three cases only including an exact documentation of what the farmer actually said (an audio tape). The farm story was written using the two analytical headings *The Farm and the Farmer*, and *The clearing(s)*, and included the farm land map and selected photographs. Similar to the reworking in the case of the *land use farms,* meanings were condensed but also tied together due to the different character of the field documentation.

Since the farm studies contrast with each other, the multiplicity of farms and landholders has created a relief against which the farmer situation as an abstracted understanding started to gain contours during the research. The empirical research has fed into creating this abstraction such that the theoretical perspective on the (farmer) landscape presented consists of concepts that were applied 'from start' and concepts whose relevance emerged during the research. Concepts centering around materiality and corporeality as conditioning farming, and the situated-ness of farming, were applied to approach the farm cases. Concepts to further explain the empirical findings are those centering around orientation and commitment. This process of theoretical sampling (see below) also implied that observations derived from the farm studies presented me with 'saturated problems' that steered subsequent choices and theoretical weightings.

Theoretical Sampling and Critical Interpretation

I would suggest that my work has utilized 'grounded theory' -methodology in its analytical approach in that I have sought to bring out reasons for landholders' land-use choices based on the empirical material. My approach however contained a clear prescription concerning 'what to look for' formulated as interpretive frames. This means that I utilized what is usually called 'etic' codes, thus codes that do not arise from the interviewees' wordings but are applied 'from the outside' (as mentioned above: identity, inheritance, investment, living environment, interest, invasion). I can therefore see in the empirical study elements of 'grounded theory', of explanation by understanding and by abstraction – the latter especially in the *clearance farm* cases. By these means, I have arrived at an overarching interpretation of factors of importance shaping the farmer situation in the concepts of time-economy and embedded values (discussed in Part C). I understood successively the utility of the notion of embedded values in the context of farm ownership and farm land; after having first worked with expressions such as multiple values or complex values. Embedded as an expression stresses the fact that the values that are perceived appear to locate in the land and not in the head of the observer. This analytical process can be described by using the ideas of theoretical sampling and critical interpretation. The choices of sources for empirical materials reflect the advancing findings as I sought for additional sources of ideas concerning the

relationship between the farmer and the land, namely other kinds of situations of land use change. This essentially made for an on-going theoretical sampling: "*Theoretical sampling is about discovering relevant concepts and their properties and dimensions*" (Corbin & Strauss 2008:144). Advancing with the analytical reconstruction of land use decisions, I worked on relevant contextualisation of the material. In other words, the contextualisation was developed during and by the theoretical sampling, and therefore represents a result of the fieldwork and the analytical reworking of materials derived. Corbin & Strauss (2008) go on to explain:

"Participants provide the data that tell us about those concepts. So, when researchers sample theoretically they go to places, persons, and situations that will provide information about the concepts they want to learn more about." (Corbin & Strauss 2008:144).

The hard work of the 'soft' method then consists in attaining 'accuracy' in interpretation (Crang 2005), or as Kvale (2007) formulates, in attaining "*precision in description and stringency in meaning interpretation*" (Kvale 2007:12). Accuracy in a qualitative study is besides a sound field documentation influenced by the 'context' as a signifying and framing device, "*a collection of factors relevant to determining what is said by a given utterance*" (Bowell & Kemp 2010:245). Contextualization builds on an intuitive judgement of interest/relevance depending on the 'double contexts' of the case on the one hand and the research project on the other, as Eräsaari (2007) points out. It is about adjusting the case-based details and the topic and goals of the research to each other in a coherent manner. This process is highlighted by Corbin & Strauss (2008) as follows:

"The purpose of an exploratory investigation is to move toward a clearer understanding of how one's problem is to be posed, to learn what are the appropriate data, to develop ideas of what are significant lines of relation and to evolve one's conceptual tools in the light of what one is learning about the area of life." (Blumer 1969:40, quoted in Corbin & Strauss 2008:65).

The preliminary contextualization I applied was preconceived, in line with previous work on 'drivers of land use change', i.e. social, economic, cultural, political dimensions affecting land use decisions (cf. e.g. Bürgi *et al* 2004). The idea and the currently often-rehearsed taxonomic driving force -approach recur(s) in the Observational Guide (see Appendix III). Technological development that affects clearance methods, or the 'peripheralisation' of mosaic landscapes due to yield and price comparisons on a globalized market, are examples of relevant drivers of change that were encountered in the cases studied. If my study were described in terms of on which drivers of land use change it focuses, it would be fair to say that of primary interest are the non-economic and spatial factors. However, I have re-contextualised land-use decision-making in this study by using a rich concept of landscape, which means that I departed from thinking in terms of drivers during the research process. This focus on land-use decisions as situated opens a window onto (in)stabilities in boreal landscapes, useful for assessing landscape development in a formal manner.

Finally, I turn to the idea of critical interpretation, which I have found helpful. To say critical is in fact another way of stating that an "*analytical mode of interpretation known as explanation*" (Cloke *et al* 2004:307) enters the processes of making sense of the empirical material to complement the understanding mode. Interpretation as such is about saying

something about a text, an image or an action (Ricœur 2007 [1991][44]; Cloke *et al* 2004:285ff.); interpretation is conversely also about the grounds on which what is said can be said (Stelmach & Bartosz 2006:167ff.). Qualitative inquiries largely rely on an interpretive approach, due to their orientation towards significance and meaning as derived by inquiring into the respondents' own perspectives on their situation (Kvale 2007). Repstad (2007) in his discussion of qualitative inquiry summarizes:

"In qualitative inquiries the aim is to describe totalities, in the sense of whole and concrete settings and whole persons, not isolated 'variables'". (Repstad 2007:140, my translation).

The hermeneutic approach has entered geography via the arts and humanities, and the social sciences, as lately as during the last four decades (Cloke *et al* 2004:307). This approach is often described as an alternating study of parts and wholes, entails a merging of the researcher horizons (or frameworks) with the interviewees' horizons (Hartman 2004), which means that the interpretation process ends with a new horizon having been created by the 'working-in' of these differing frames of understanding into one (in the mind of the researcher). This can also be characterized as a re-construction (Hartman 2004).

The reconstruction of the background of the interviewees' land-use choices, in other words, the recovery of the meanings present in their relationship to the land (to follow Cloke *et al* 2004), means that I have attempted to re-connect land use to its 'author', from where it emerged (the background in Ahmed's (2010) sense). Traditionally, it is regarded as being impossible to both understand an "*agent's self-understanding*" and to apply a distancing analytical frame (Hendrickson 2004:384). Scholars nevertheless suggest that hermeneutics can be critical (Kögler 1996; Hendrickson 2004); moreover, it has been argued that both understanding and explanation are dialectically involved in the process of interpretation of human matters (Ricœur 2007 [1991]:125–143). Critical hermeneutics is thus concerned with introducing a critical nuance to counterbalance the risk of missing the fact that expressed views are individual and situation-specific. This line of thinking has been applied in my study to form a dialectical consulting of the empirical material and the theoretical frame. By such an approach, the observed land-cover processes were interpreted based on understanding respondents' views, but also by taking into account the timespatial conditions, while retaining the coupling between land cover and land use. Remaining interested in the grass meant that land use was studied from point of view of land cover change.

Furthermore, it has been argued that interpretation locates at the very core of human existence: that the mode of being is understanding and that language is deeply intertwined with human existence (Stelmach & Bartosz 2006). An ontological perspective of this kind asserts that understanding is more than cognitive competence. In such a vein, Selander & Ödman (2004) argue that hermeneutics as the art of interpretation, in its modern forms, deals with the conditions of human life. This is relevant for the study at hand in two ways. Firstly, as an ontological modality – tackling the timespace conditions in farming may be described as a result of understanding (how to exist as a farmer); secondly, the interpretation of

[44] "The kind of distance that we found between the intention of the speaker and the verbal meaning of a text occurs also between the agent and its action." (Ricœur 2007 [1991]:153).

the background of land use outcomes remains limited by the capacity of the researcher to reach out to an understanding of the specific utterances of human life at hand.

Whose Landscape…? Quality of the Study

I conclude this chapter by reflecting over the question 'whose' landscape the study depicts and by discussing the quality of the findings presented. I reflect on the impact of my own person on field encounters and on the information derived during fieldwork. This means that I also touch upon the underlying approach of the study.

The study brings out everyday aspects of farming and attempts to provide an abstraction of the understanding I gained of these activity-based landscapes based on the farm studies, in other words, to "*produce well-described situated knowledge*" (Kvale 2007:143) - at least as-well-as-possible-described, one might feel necessitated to add. Thus the everyday, the manifold, and the socio-spatially situated are acknowledged as significant modalities influencing land use decisions, while insisting on giving materiality a focal role in these respects. The perspective taken here on land use – a classic field of study in geography – cultivates an interest in what can be called the reproduction of the rural land cover, a temporal and reciprocal concern that sets the study apart from addressing land use as the business of resource extraction only.

Limitations of the Study

The study presented here lacks a systematic investigation into the role of farm payments or other subsidies in affecting the land-cover continuity/change observed (for an additional discussion, see chapter C2, section Reflections on the Interpretations Presented). This must be regarded as a limitation pertaining to the findings presented. During the first part of fieldwork, the importance of the recent option of utilizing farm payment as sources of income *coupled to land* but de-coupled from production did not occur to me. At certain points, mention was made of the relevance of subsidies for land-cover-related decisions – in some of the farmer interviews, in the discussion during the 'study circle', and in comments by county officials; all of these comments especially referred to the separation of arable production and land management requirements from 2005 onwards. The subsidization before that point in time has been variable but essentially connected to arable production. In the farm cases studied, land-cover continuity appears in some cases to be disconnected from agricultural production, in others not. Also regarding the production of new arable fields the subsidization is of relevance, similarly as the over gain a new field represents a farmer with in providing annual cash income.

A further limitation of the study concerns the findings on forest clearance; I ended the field investigation of this phenomenon with the feeling that new aspects were still showing up concerning the reasons why contemporary farmers clear forest. However, I also felt that additional farm-level studies would perhaps not be the best step to take next. The results presented here therefore focus on those aspects that could be judged as grounded due to the repetition of similar descriptions: the process of creating new arable fields and the placing of new land. I have included considerations of hindering/enabling neighbourhood processes that appeared to shape access to land. These considerations should be taken as indications of directions for future studies; they underscore that more focused research into the social aspects of land use is in place (neighbourhood factors

have been covered by Schmit (2006) in a Belgian case study).

Credibility of the Study

Corbin & Strauss (2008:302ff.) suggest that credibility/quality in a qualitative study has to do with fulfilling specific conditions; credibility is here used as a more encompassing term instead of validity. The authors judge that the pursuit of validity may risk turning out dogmatically in relation to truth.

The approach in this study has been to look deeper into the implications of the work that produces the visually observable landscape. Here, both epistemological and ontological questions concerning reality are of relevance. When it comes to epistemology, I would suggest that scientific disciplines come with their specific constructions of reality, which is reflected in the conceptualisations utilized (cf. Stephenson 2005:198). In landscape research, the term *landscape* represents such a construction, as an example: knowledge of this concept is not necessary for the ability to perform farming (cf. Setten 2005). Yet, in order to be able to see phenomena, concepts are necessary. The conclusions presented in this study are founded on the chosen concepts of materiality, embodiment, and timespace, on the chosen farm cases, and on my interpretation of the empirical findings – a characteristic trait of qualitative studies is that other plausible interpretations may be possible from the same data (cf. Corbin & Strauss 2008:302). The credibity of the presented conceptualisation has then to do with the work it can do to inform other studies.

When it comes to ontology, it has been argued that an account on reality can scarcely claim generalizable results as reality in itself may not match its conception as single and uniform (for an elaboration of this argument, see Law 2004). Concerning human life similar has been proposed by Schatzki (2010a): "*Many significant and pervasive features of human life are not universal*", Schatzki (2010a:xvi); much of human life is "*profoundly variable*" (Schatzki (2010a:xvi). In alignment with such argumentation, the results reported here can only be taken to cover a stretch of reality – In fact, if one was to assert that research results should be viewed as universally valid, doing so would equal with a closure of future options, and a disabling of any further interpretations. Here, I suggest, the 'more encompassing' terms of quality and credibility of research come in. In this vein, my conviction is that this thesis proves a reflection-encouraging framework that can inform (but not be imposed on) other studies in other realities.

Below, I reflect on my study taking a set of conditions presented by Corbin & Strauss (2008) as guidelines. Consistency in carrying through the chosen method is important as is awareness of the implication of methodological choices. Concerning these, the thesis pulls together a wealth of materials and aspects. This has to do with the fact that the study first seeked to cover areal development in one region over time. This broad study was then, due to my impression of saturation in the material (the grass persisted), turned towards a narrowly focused study on forest clearance on farms that was theoretically motivated by the urge to find land cover change. Later on, I returned to the first material with the question, why was the land cover sustained in these cases. This means that the study has been moving between the farm, the single field, and the landscape, and that it alternated between looking for change to attempting to understand non-change. The methodology in the *land use farm* study has been focused on interview analysis, supported by observations of cadastral maps, and in the *clearance farm* study the interviews have been supported by field visits together with the

farmers. This shift mainly concerned the research strategy, which I have attempted to make explicit in the previous discussion of the empirical material, while the interpretation of farmer accounts remained the main analytical approach, with the difference that most *clearance farm* interviews relied on notes only. The role of the farm story and its approval by the interviewee was thus enhanced in the latter study. The *land use farm* study enabled the 'discovery' of the focal role of arable land as representing an active intervention, although it was not aimed to do this work from the beginning. This role of the arable fields is an interpretation made *after* fieldwork, based on the broad survey of all land covers on the farm, their changes, and the meanings associated with them. This means that I have no knowledge about how the farmers might have answered if I had conducted a direct conversation with them on the role of the openness of land and the arable fields as accomplishments to them. This might in fact provide the finding of the importance of the openness of land to the farmers more weight than a direct inquiry. A direct inquiry could risk imposing the importance of the arable land onto the interviewees. It follows that the content of the valuations I perceive in the farm stories is expressed in 'my words'.

Further, for generating quality in a study, clarity of purpose as to whether the study aims at description or theory development is crucial. In this case, the study was from beginning geared towards formalization and abstraction; the detailed description of empirical findings has been provided in order to show the evidence on which the interpretations presented are based. My discovery of the utility of the three-part conception of *landscap* and the interpretation of the farmer situation as containing time-economic rationality and orientation by embedded values resulted from studying farms and talking to farmers.

A further condition for generating quality in a qualitative study is about self-awareness, i.e. awareness of the influence the researcher is having on the research and *vice versa*. Here, I can note that the fieldwork especially made an impact on me that needed energy to tackle. I took on keeping a field diary at a late phase to stir in and sort the, in part non-verbal, impressions made during field encounters. These comprised encounters with landscapes and with people. While I felt stimulated by the various landscapes, I was at times overwhelmed by the intensity of the human encounters – it took time to let the dust settle. During this process, I learned how to 'manage' field experiences; the work of the sociologist Reinharz (2011) was helpful in this. According to her, field encounters activate and resonate with a broad register of selves in the researcher, which the researcher utilizes as tools and must necessarily accept as limitations. The impact of the researcher's person on research, besides the researcher's pre-knowledge on the subject, is mainly about the positions and reactions created by being the kind of person one is – in this case, middle-aged, blonde and blue-eyed, female and married, Finnish, a non-farmer with interest in organic farming. That 'more-than-researcher' traits come into play is largely due to the influence of these 'selves' on the perceptions of the researcher and of the research respondents (Reinharz 2011). The researcher as 'somebody' more or less explicitly benefits from the selves which others perceive in her or which she can mobilize as resources in the field, especially during longer stays in field. I would suggest that this applies to shorter fieldwork periods, too. This influence can be viewed as a counterpart of the shifting of positions (moving the researcher) that is the idea behind doing fieldwork – one

cannot leave behind oneself. My assessment is that during my fieldwork especially the "*personal self*" of the non-land-owning urbanite wishing to be guided in the world of farming/farmers came to the fore. More subtle utilized selves were as I believe, firstly, the sympathetic and trustworthy woman to whom it was easy to talk, and secondly, more surely, the Finnish foreigner who was invited as a guest to know more. While the interest in organic farming was not part of the conversations, I realized that the observations made in passsing of the agrobusiness on large-scale on some of the farms took time to melt (and sort-out); similarly, it took time to find a right balance to account for the difficulties I understood (other) farmers were struggling with on their farms.

The "*researcher self*" of an expert-on-rural-land-use evolved during fieldwork and was somewhat unconsciously put to work in its later phases; this self facilitated the less structured interview mode employed during the *clearance farm* interviews. The exploring geographer on the road as a "*situational self*" was put to work in the field to discover clearings and to find farmers clearing land, and facilitated the experience of and existence in new landscapes.

As an interview is a social occasion, gender and other social relations come into play when an interview is conducted; this influences the knowledge generated (Valentine 2005; Corbin & Strauss 2008; Reinharz 2011). One specific, yet tentative observation I have made concerning gender and age is about two interviews with female interviewees of ages comparable to mine who apparently articulated their farming experiences in a way that was much in line with the articulations I was developing of land use as situated in timespace. In making sense of the reasons for this experience of a mutually shared insight into the praxis of land use, I realized that both respondents are farm heirs carrying thus the main responsibility for farm management[45], that both were interviewed without their husbands, which might have facilitated a specific kind of open atmosphere between us. My speculative suggestion is that it felt uncomplicated to discuss everyday experiences with someone of one's own age and of the same sex; and that it was easy for me as researcher/interviewer to understand the reasoning put forward by these respondents. This confirms that the discussion offered in this thesis *is* 'situated' due to it having been performed by such and such type of person. Moreover, the detailed interest shown in this study for forest clearance is influenced by the fact that this phenomenon came to represent an exciting novelty in the (disciplinary) landscape, in which I am included. The farm visits and observations of clearings moved me as researcher and person, leading me to develop a deepening interest in the phenomenon of land clearance. I got excited when a piece of land under reclamation appeared in the middle of 'nowhere', and I started to see beauty in the clearings. Getting interested in these projects made it possible to see and hear the enthusiasm and joy of the farmers, who themselves mentioned the astonishment they felt at being able to look over a piece of land where a forest had stood the year before. Obviously, others, too, can be impressed by a view over a newly cleared field: the local newspaper team arriving to interview the farmer who is carrying out a clearance project spontaneously burst out "Wow!" at the sight of the large open field against a backdrop of forest. In retrospect, I agree with Corbin & Strauss (2008:85), when they say: "*Inevitably we are shaped by, as well as shapers of, our research*". In this study, fieldwork

[45] Farm codes CF 8 and LUF 22.

has been an essential device for moving the researcher.

In sum, I would suggest that the research performed here relies on the original distance, and the attempt to bridge it during the research process, between the worlds of the researcher and the researched. In doing this, it provides a novel perspective on land use as the reproduction of rural landscapes. By an outsider, ordinary aspects of farming could be contextualised in new ways to offer a contribution to the research field in question.

Similar applies to the *land use farm* interviews in that I found that the actually occurring land use, especially the land cover, seemed to be largely taken for granted by interviewees. I maintained an interest in grass cover that had not changed, while the interviewees preferred to inform me about the huge change they claimed had happened since the previous study on land use changes in 1992. Successively I came to acknowledge the importance of social-practical aspects induced by the decline in the numbers of farmers, dairy cows, etc. behind the prevalence of grass and the 'many shades of green' (in the hayfields that are discussed in the findings). I started to understand. In this sense, the *land use farm* interviews moved me as researcher at least as much as the clearance fieldwork that led me to travel around the country, although this moving happened post-interview.

Further conditions to ensure quality in a qualitative study mentioned by Corbin & Strauss (2008:304) are training in doing qualitative research, hard work, the desire to do research for its own sake, and developing sensitivity, empathy, carefulness, respect, and honesty. Concerning the fulfillment of these conditions, it is difficult to auto-judge. From the discussion above and the previous sections of this chapter can be gleaned, I think, that this study has been a piece to learn both how to tackle fieldwork and how to deal analytically with qualitative materials. The learning has also been about learning to be critical while understanding, but also about learning to become curious. This connects to a further condition: willingness to relax and get in touch with the creative self, mentioned by the authors. I agree with Corbin & Strauss (2008) that these may be important aspects in doing research, as research is about generating new knowledge (i.e. embarking onto an excursion in unknown terrain with oneself as the guide). Creativity, I believe can have an effect when combined with the conditions 'hard work', 'training', and 'the desire to do research for its own sake'.

Corbin & Strauss (2008:298) thus put weight on the following of procedures as much as on creativity in order to produce quality in research. Bowell & Kemp (2010:62ff.) approach the issue from the logical point of view, defining validity as the case, in which the conclusions follow from the premises (regardless of the truth-value of the latter). The important question here is according to the authors, whether the conclusions presented could be false. This question I have elaborated on through the detailed display of the findings in Part B, the discussion of the limitations of the study in this section, and the discussion of alternative interpretations to those presented in Part C (see chapter C2, section Reflections on the Interpretations Presented).

At the end of the day, the credibility of a study must be a matter of external evaluation and its ability to produce "*trustworthy, believable*" (Corbin & Strauss 2008:303) accounts that "*resonate with readers' and participants' life experiences*" (Corbin & Strauss 2008:303).

Part B. Empirical Findings

Part B presents the reader with a detailed account on the empirical findings from the farm studies conducted, displayed around themes. The detail and thematical display aim at facilitating the understanding and judging of the discussion presented in Part C that focuses on the interpretations of the land-cover dynamics observed according to the perspectives given by the research questions. The argument in Part C revolves around time as an essential resource in spatial practice such as farming with important consequences for farmers' ability to manage the land and the way in which they do this. In addition, I argue in Part C that the creation of values perceived in open arable fields relies on an interlinked process of identity formation and engagement in farm management. Part B provides the basis for the interpretation of these farm-based processes (Research Question Two: *Which farm-based processes are associated with the land-cover dynamics found?*) that produce the specific land-cover dynamics concerning the distribution of forest and arable land (Research Question One: *What kind of land-cover dynamics can be identified on farm level?*). This offers the means for discussing the landscape effects of the land-cover dynamics deriving from the farm-based processes identified (Research Question Four: *Which landscape effects on the distribution of forest and arable lands in boreal landscapes do such farm-based processes indicate?*). Moreover, the presentation of the findings from the farms aims at grounding the interpretations of the farm-based processes (Research Question Three: *Which interpretations can be offered to understand the farm-based processes found?*).

The findings in part B are presented in a manner of reporting data, yet the presentation is geared towards discussing the occurring land use activities and land management decisions from the point of materiality, corporeality and location. I start with a description of the land use activities and other farm-based activities on the farms studied in a number of chapters (Land Use Activities on the Farms Studied; Tilling Work; Non-farming Activities, New Crops, and Invasions into the Farming Spaces; Land Cover Changes during 1990 – 2010; and The Background of the Land-Cover Processes Observed). Following this, I turn to forest clearance for arable use (Forest Clearance). The clearing activities imply an intensive encounter with land, in the aim of separating out parts of what previously made up a forest in order to provide a soil suitable for arable land use. My thesis accords thorough attention to recent forest clearance, since it is rarely described in the literature and this study presents a suitable frame for providing insights into this phenomenon. This discussion offers a context for understanding the placing of clearings on the farm domain, in order to provide grounds for discussing the resultant landscape dynamics. I conclude the chapter by presenting examples of what I call domain management employed by farmers seeking to reorganize the farm domain in order to reach a as good a farming practice in their specific circumstances as possible (Moving, Placing and Gathering Land).

B.1 Land Use Activities, *land use farms*

The main findings concerning the land use activities on the *land use farms* are presented in this chapter, which means that the discussion revolves around hayfields, grazing and cattle. The fact that grass is grown on fertilized cropland is sometimes understood in terms of a desire to increase production (Martiin 2011:200f.; Stenseke 1997). On the *land use farms* haymaking and the keeping of grazing animals appear to have various backgrounds that are not confined to the endeavour to optimise and increase agricultural production. What might appear similar fields of grass can be several things.

Hayfields

Cropland featuring varying mixtures of grasses and clovers is common on *land use farms*. After the first or second hay harvest, cattle can be put to graze the field. Hay is in fact the main crop on the *land use farms*; additionally, some farmers grow barley alternating with oats, and one farmer reported peas (Table 3). The cropping on *land use farms* mainly aims at providing feed for farm animals, either the farmer's own or the leaseholder's animals. The distribution of crops among the additional farmer contacts in this region is similar: hay is grown by the leaseholder with a few exceptions (see the section Selection of farms for details on this group). More often than in 1990, the cereals are harvested before full maturity. A full-time farmer reports having stopped threshing oats four years ago due to wild boars "*harvesting*" (farmer interview) the ripening crop before him. Another full-time farmer maintains that it is "*ridiculous to thresh here*" (farmer interview), referring to the low(er) yield level compared to the better-quality soils on the plain as the reason for this. A third full-time farmer stopped threshing because the cost was higher than the farm-gate returns from the cereals; this was at the same time as they stopped with pig husbandry, meaning the need for cereals for fodder on the farm disappeared. On these farms, the cereals are sown in with the hay the first year after ploughing and mixed, non-threshed, in the green fodder for the cattle.

Table 3. Cropping on the *land use farms*

Crop	Crop Use	
Hay	for own use n=9	for leaseholder n=15
Barley	*not threshed n=2,*	threshed n=2,
	alternating with oats n=1	alternating with oats n=1
Oats	*not threshed n=2*	threshed n=2
Peas	n=1	

The soils as such would be well suited for growing cereals, a part-time farmer states; likewise, a full-time farmer maintains that oats actually thrive, so "*it's a pity not to let them ripen*" (farmer interview). When the cereals are harvested at maturity, they are sold as pig husbandry that mainly consumes fodder grain has disappeared after having been more usual in this region in the past. Farmers maintain that they have stopped keeping pigs primarily due to farm specialisation and poor viability in pigs. Moreover, the farmers could not envisage ever returning to pig production in the future due to a combination of the regulations concerning the manure spreading area, and the necessity of large-scale farming – in this mosaic landscape it would be difficult to achieve the necessary farm size.

Agricultural production on the *land use farms* has decreased or ceased during the research period for two reasons: firstly, it has become difficult to make small-scale agriculture viable; and secondly, land use activities are wound up due to

old age. This then has led to the intensity of land management to be reduced. The farmers maintain however that the land cover on the *land use farms* has in the main remained unchanged during 1990–2010 besides the small number of changes to the crops grown and to the land cover. Land cover changes have been reported by five farmers, in all but one case the changes concern single parcels (these changes are discussed below in the chapter B4). While the body of arable land on the *land use farms* thus remains arable, in the background things have changed:

"The only change during the last 20 years is that we don't take care of the land ourselves any more – but it's still looked after in the same way [as when we managed it]" (farmer interview).[46]

During the 'study circle', another farmer said, with regard to the region at large, that:

"Even though a lot has changed on the farms [people have grown older and retired, animal husbandry has undergone major changes], most of the lands look like they did [twenty years ago]" (study circle notes).

A third farmer specifies that "*[the land] that was open in 1973 is still open*" (farmer interview).

The farmers' accounts suggest that withdrawal from agricultural production and from engagement with the land have only had a limited influence on land cover. I take this to indicate that reforestation is halted by non-production functions and values of the arable land, which motivate landholders to seek solutions that make continued land management possible, in spite of a low level of economic return and/or capacity restrictions. One such solution comes in the guise of hayfields.

Farmers in both cases (old age, farm-external occupation) refer to growing hay as a means to keep the cropland under cultivation, with the added measure of grazing – possibly supported by mowing the grass as a partial solution if the number of grazing animals is insufficient, or as a temporary overall solution. Growing grass is viewed as a sensible way to manage cropland under the prevailing circumstances. It is actively considered as an option when planning for withdrawal from farming: a full-time farmer with cattle who is planning to withdraw within a couple of years envisions fallowing the arable land, to be "*mowed once a year with a proper shredder*" (farmer interview). He assumes that finding a (suitable) tenant will take some time, so hindering the regrowth of bushes on the fields becomes his objective. At this extreme, i.e. the least intensive end of the land management scale, fields can "*lie in hay*" (farmer interview) year after year, being mowed once a summer. Having a field 'lying in hay' then functions as a provider of open lands rather than of arable produce. In the chapter B5, I return to discuss the values of open lands from the non-production point of view.

To shift to the full-time farmer with cattle: here hay harvest is one link in the chain of producing top quality beef and constitutes a precision task, assisted by a mower with a working breadth of 3.5 m that allows for cutting more hay with optimal ripeness and nutrient content than usual implements. The better the fodder quality, the better the beef will be, and obtaining the highest classification for the farm's beef brings the best

[46] The quotes from taped farmer interviews that are provided in English translation have been proofed (not shown in original). I depart in this thesis from providing longer verbatim quotes, which weakens the demonstration of how I have arrived at the interpretations presented. Only shorter passages are provided, as ensuing that quotes functioned in this way would have required both long interview excerpts and the skills of a professional translator. Selected longer quotes are provided in the Appendix VII for Scandinavian readers.

returns for the farmer. A field with hay, when in intensive fodder production, receives a large number of tilling 'visits' (see the next chapter Tilling Work). This means that, when in intensive fodder production, hayfields are quite differently managed compared to when the grass is cut but left lying on the field. In addition, there are in-between 'shades of green' between the most extensive and most intensive production levels such as having good quality hay for bales for sale or having some fodder for a few grazing animals to manage the land.

According to the participants of the 'study circle', rational intensive hay cropping is profitable. The farmers qualified this by stating that it depends on the conditions each year brings. Profitability does not last forever – the hayfield must be refreshed regularly by ploughing and reseeding to maintain a good yield level, and hayseeds are expensive, the farmers explained. Consequently, the study circle participants deemed least apt those statements that suggested that hayfields are inexpensive and an easy choice. The farmers agreed on the statement that hay is a suitable crop for the region, yet they also deemed the statement that hayfields receive a subsidy relevant, as well as the statement that haymaking produces open land (for the results from the ranking exercise, see Appendix VI). The study circle discussions, too, conveyed that hayfields need to be read in their situational context on the farm, i.e. the land management regimes, which can range from highly intensive to fairly extensive. A hayfield can represent a space for intensive fodder cropping or appear little more than an extended version of a lawn. A hayfield can obviously have various backgrounds, the *land use farm* cases indicate. It also seems that haymaking and keeping grazing animals allow for partial or step-by-step withdrawal from farming activities (a discussion I return to in the next section), although they are also capable of supporting intensive agricultural production. The farm projects incorporating hay range from intensive high quality beef or dairy production, to farms where the aim is to conserve the open lands with only few or no cattle remaining. In other words, by choosing hay as a crop the intensity of engagement can vary, or decrease, without land management being compromised. The conclusion I draw is that hay gives visible expression to the perception of intrinsic values in open land. These values are conserved by what is sometimes labelled 'passive' land management.

Figure 9. Hayfields on the Farm Domains Studied

Grazing and Grazing Animals

Grazing can be considered a counterpart to hayfields in that grazing animals, like haymaking, are present in various farm situations from large-scale to minor scale. Hayfields, presence of pastures and animal husbandry with

grazing animals are of course interconnected, as the land provides fodder for the grazing animals. In 2010, several *land use farms* had cattle; the vast majority however has a history of cattle husbandry (Table 4). Today, on two farms the farmers are engaged in large-scale cattle projects, six farmers maintain minor herds of cattle, and one farmer has only two cows with calves; on one farm, grazing has always been by horses. On ten farms, grazing animals have been kept throughout the twenty-year period, eight farmers gave up animal husbandry some time during 1990–2010, and on six farms no grazing animals of any kind were kept during 1990–2010. One of these latter farmers has recently moved to live on the farm and plans to engage in animal husbandry (for the sake of the open landscape, while the reasons for moving include the desire for space for the family's hobby, which was constrained in the town).

The cattle projects vary considerably in intensity. The keeping of cattle may be directed towards production ends (beef, milk), and/or rooted in an interest for cattle in general[47] or for a traditional breed[48], or the pleasure of having animals (see below). Keeping cattle is not only instrumental for the sake of having the land grazed. The retired part-time farmer explains that he keeps cattle because it is pleasant to have them strolling on fields near the farmhouse; he says that it is "*nicer than having it [the land] empty*" (farmer interview), while adding that cattle are also effective in keeping down forest regrowth. Cattle appear to make a valued 'part' of the rural landscape: in fact, the presence of cattle is a presence of animal bodies, sounds and smells (Martiin 2011:196). The farmers who keep cattle combine the income from animal husbandry with other income – in most cases their old age pension, in three cases external income. On three farms, the number of cattle was increased at some time during the period, alongside increases in farm production and in the time-input into land use activities on the farm (albeit due to different reasons). Amongst the farmer contacts, a similar spread and proportional distribution of the various combinations of factors can be observed.

Scaling down their farming activities and shifting to non-farming sources of income, some farmers on the *land use farms* appear to switch their interest to the forest. Forest has become a focus for investment and forestry work a part of leisure time activities. The farm forests generally function as places to visit, experience, and enjoy – several of the farmers talk about the joy of strolling in their own forest and experiencing the wildlife all around them (I will be returning to this aspect later). Thus, despite their withdrawal from arable activities, the landholders retain a relationship with their farm and derive resources from its lands. One interviewee talked about plans to create a wetland in riverside meadows, relating that a rare bird species lived there, and another discussed the places that the family likes to visit on the farm although the land is leased out and managed by someone else. The place of the farm remains encountered in detail also when farming is not anymore practiced. However, withdrawal from farming due to retirement may mean withdrawal from such detailed going-about on the farm lands. An observation I made during farmer interviews was that a retired farmer might connect differently to farm land than an 'active' farmer, the discourse being about the farm as a place in the past rather than the farm just outside the window.

[47] Farms LUF 15, LUF 5, LUF 21, LUF 23.

[48] Farm LUF 19.

Table 4. Grazing, Farm Income, and Farmer Age in 2010

Source: *Land use farm* interviews and ten farmer contacts. The additional farmer contacts in the same area are included as their arable land is often managed by the farmers on the *land use farms*, which means that this land is part of the farm domains of the *land use farms*. These cases work to reinforce the picture gained from the *land use farms*. The grey line is the divider, with *land use farms* above the line and the farmer contacts below the line. I have deliberately omitted the farm codes in this table due to anonymity concerns.

			INCOME					
Grazing 2010	*Grazing during 1990-2010*		*Retired*	*Non-farm*	*Farming*	*Year of Birth*	*Age 2010*	*Change*
cattle (29 cows, horse)	beef cattle, increase	*	x		x	1943	67	↑
cattle	cattle	*	x		x	1942	68	↓
beef cattle (40 cows)	beef cattle, increase	*	x		x	1943	67	↑
cattle	dairy cattle until 1995/96	*	x		x	1932	78	↓
(no pastures) horses	horses	*		x	x	1947/1956	58,5	–
beef cattle (10 cows)	beef cattle, increase since 2000, pigs until 2004	*		x	x	?	40?	–
beef cattle (19 cows)	dairy cattle until 2006	*			x	1944/1947	64,5	↓
beef cattle (in all 240)	since 1993 beef cattle	*			x	1970/1971	39,5	↑
dairy cows, bulls (in all 160)	dairy cattle	*			x	1962	48	–
cattle (2 cows and 4 calves)	?	*		x		1946	64	–
leaseh cattle	cattle until 2009	2009	x			1933	77	↓
leaseh hay	beef cattle until 2007	2007		x		1954	56	↓
leaseh cattle	dairy cattle until 1996, beef cattle until 2005 (18 cows)	2005	x			1926	84	↓
leaseh cattle	beef cattle until 2004, some horses until 2000	2004	x			1939	71	↓
leaseh cattle (own sheep)	dairy cattle until 1982, beef cattle until 2002, sheep, horse	2002		x		1946	64	↓
leaseh cattle	dairy cattle until 1987, beef cattle until 2000	2000	x			1943/1946	65,5	↓
leaseh cattle	dairy cattle until 1991, beef cattle until 1998 (10 cows)	1998	x			1930/1934	78	↓
leaseh hay	dairy cattle until 1985, beef cattle until 1993, horses	1993	x			1926	84	↓
leaseh cattle (brother)	leaseh cattle (brother), pigs 1994-2006	**		x		1956/1956	54	↓
leaseh cattle	leased out	**		x		1954/1955	55,5	–
leaseh cattle and horses	leaseh cattle	**		x		1950	60	–
leaseh hay	leaseh hay	**		x		1946	64	–
leaseh cattle	leaseh cattle	**		x		1961	49	–
leaseh cattle	leaseh cattle since 2005 (previously sheep)	**	x			1945	65	↓
calves	decrease no of animals	*	x		x	1939	71	
beef cattle (10 cows), sheep	beef cattle, sheep	*		x	x	1947	63	
cattle	cattle	*			x	1948	62	
leaseh hay	cattle until 2009	2009	x			1925	85	
co-management	dairy cattle until 2008	2008	x			1935	75	
leaseh cattle, hay meadows	beef cattle until 2002 (35 cows)	2002		x		1951	59	
leaseh hay	?		x			1932	78	
(estate with forest only)	?		x			1942	68	
leaseh cattle	?		x			1935	75	
leaseh cattle	?			x		1950	60	

* keeping cattle in 2010
** no own cattle in 1990, nor after
leaseh leaseholder (hay for the leaseholder or the leaseholder's cattle)

Farmers are not hindered from farming and keeping cattle due to off-farm occupations, as mentioned. A part-time farming couple keeps cattle "*for the sake of the open land*" (farmer interview), and they have done so since taking over the farm as 'moonlight farmers' (as the saying goes) alongside their external employments. The same applies to previous full-time farmers who continue keeping cattle. For example, a farmer couple, dairy producers since the 1970s with thirty dairy cows, switched to beef cattle in 2006 with a smaller herd size (based on nineteen cows):

"We have a few beef cattle now, a little suckler herd. It's because of our age that we finished with dairy cows, and basically we've kept the beef cattle to keep the fields open" (farmer interview).

Engagement in cattle can express varying degrees of intensiveness of farm management, similar to the way in which hay works as a flexible conserver of fields. It can be underlined here that hay is present as the main crop on *all* farms, not only those featuring animal husbandry, thus

regardless of engagement in livestock farming. The hay is utilized for fodder for the farmer's own cattle or by the leaseholder for her/his cattle or it may be sold in bales, or cut and left lying on the field.

It can be seen that landscape management, and a commitment to 'keeping the lands open', i.e. preserving the openness of single fields, are closely interlinked goals on *land use farms*. Hence, the landscape that is managed is varyingly about the "*open landscape*" (farmer interview), the countryside (semi-natural pastures in a mosaic landscape, farm LUF 9), attachment to one's childhood's agrarian landscape (farm LUF 18), or a pleasurable living environment (farm LUF20). Cattle and the farm landscape are closely interconnected, as grazing provides for openness of land and vista under the trees near the farmhouse (LUF 15 specifies that it is better to have cows borrowed from the leaseholder here than one's own sheep).

Over time, the keeping of cattle tends to develop from dairy farming to keeping suckler cows, a less work-intensive form of cattle husbandry. Dairy production demands a larger daily time/work input and is referred to as "*more wearing*" (farmer interview) as milking with all the associated activities has to be carried out twice a day. The time input required by a dairy project may become constrained when, as was the case for the this farmer (couple) quoted, faced with poorer viability and the need to find complementary non-farming employment, beef production on a minor scale provided a solution which enabled the fields to be kept open. In spite of the variety of socio-economic situations and types of change on the *land use farms* in these respects, solutions have been put in operation to secure land management. This indicates that cattle and open fields are valued in their own right, paralleling the findings concerning cropland, and suggests that farming is a lifestyle as well as a livelihood. In the following, a brief description of solutions that enable farmers to continue living on their farms when withdrawing from farming is provided. It concerns those farms included in the *land use farm* -selection where ownership continuity is present since the 1950s or 1960s, i.e. these farms represent such cases where withdrawal is mainly induced by the farmer lifecycles. The farms are characterized in Table 5, below. Going through the list from the top, beginning with the single farmer, among this group of farmers with long careers on their farms, who still had cattle in 2010: he has practised the less intensive keeping of suckler cows for the past 18 years, and the plan is to continue with animal husbandry:

"As long as I'm fit enough, I'll carry on keeping young stock, so that they can keep the fields in shape, and when I can't manage I'll lease out the land. Young stock does a good job of keeping the bushes down. (…) It's nicer to have cattle on the land than having it all empty; it's nice to see them out there with their calves" (farmer interview).

As lately as in 2008 this farmer still embarked on a clearance project to create pasture on a felling lot (the clearings on this farm are discussed in the chapter Land cover changes), with previous clearings also having been effected on the farm. The next farmer, on the farm LUF 4, having spent twenty-four years with dairy cattle and another twenty-five years with beef cattle, has for the last two years had his land managed by another farmer, his neighbour, who both makes hay and brings cattle to graze the land. The farmer on the farm LUF 1 stopped having dairy cattle in 1992 after thirty-eight years, but continued to keep suckler cows until 2005. Since then, the pastures have been grazed by cattle belonging to the same neighbour farmer as mentioned previously.

Table 5. Withdrawal from Active Farming

Note: the year of birth given is the husband's, with one exception as it has generally been the husband whose age (60 years) determines the payment of milk pension. I rely here on the farmer interviews in 2010 and the research notes from the previous study in 1992.

Code	Family	Farmer since	Year of birth	Dairy cows until	max no.	Suckler cows until	Max no.	Leaseholder
LUF 5	in family since 1890/father 1931-1967	1967	1932	1992	20	continues	c. 15	-
LUF 4	father of grandfather*/grandfather/1930-1960 father	1960 (own.1965)	1933	1984	20	2009	25	cows
LUF 1	not in family	1958	1926	1996	27	2005	?	cows
LUF 6	until 1937 grandfather*/1937-1969 father	1969	1939	1991	30	2004	?	cows
LUF 2	grandfather from Hborg in 1912/father 1927-1959	1959	1930	1990	17	1998	10	cows
LUF 3	not in family	1962	1926	1985	14	1993	c. 15	only cropping
**	in family	1962	1935*	2008	20	-		co-managed

*possibly longer in family *wife

**farmer contact, farm co-managed with LUF 23

At the time of the interview, there was uncertainty as to whether this arrangement would continue:

"…then it'll have to be fallowed; I'll mow once before midsummer and once in the autumn. I can't have cows of my own on the land, so I don't know if there'll be any cattle here this summer" (farmer interview).

The cropland on this farm is taken care of by a nephew who produces hay bales of top quality, optimizing the cutting of the hay, as the interviewee told, which makes haymaking practice similar to the work of the intensive cattle farmer. Part of the downscaling is a plan to plant spruce on one field (a plan that is covered in more detail in the chapter B4). The farmer on the farm LUF 6, who kept dairy cattle for twenty-two years and beef cattle for thirteen, continues to till some cropland to grow cereals for sale and manages leased-in land. The agreements have a long tradition on the farm, he explains. But, additionally, when explaining the reasons for continuing with the lease in spite of also leasing out land of his own, he cites the lack of land, caused by the neighbourhood situation (a longer excerpt describing this is included in Swedish in Appendix VII): "*There is this dilemma with lack of land (…) that constrained me all the time*" (farmer interview). Despite this lack of land not anymore being a problem, as this farmer is winding down his farming activities, it remains on top of his mind to inform land use decisions. The remainder of the arable land (two thirds) is tilled by a neighbour who also keeps cattle on the pastures, whom the farmer gives a hand in harvest times since 10 years' time since he finished with own animal husbandry. Thus, when I questioned him about whether he had any plans to stop farming altogether, he explained that he liked farming, and had not had any thought of quitting. In my understanding, the lease is then about continuing farming, which closely connects to his long active engagement with the land, or in other words his identity as farmer.

On the farm LUF 2, milk production was given up after thirty-one years, twenty years ago, when the husband received the 'milk pension' from the state at the age of sixty; non-dairy cattle were kept for a further eight more years. During an additional period of twelve years, until 2010, the land was managed "*in another way*" (farmer interview), without the farmer having any grazing animals of his own. The solution was to lease out the land under varying forms: a neighbour came and harvested hay; a farmer was invited to bring cattle in early summer and the farmer couple would care for them during the grazing season. If the grass grew too long in one corner or another, the neighbour would come and mow it. This version of the project of 'keeping the lands open' was devised only after a close relative running a large dairy farm at a distance of twenty-three km had rejected the

offer to harvest the hay on the grounds, I was told, that the fields were too small. The solution come up with appears reasonable from that point of view; if the fields are too small, then it is better to have cattle do the 'mowing'. However, these twelve years saw three different farmers' cattle on the lands: during the first five years, the summer grazing arrangement was with a farmer whose farm is at a distance of approximately 28 km. Thereafter another farmer was engaged (again, at a distance of approximately 28 km), who retired after five more years. At the time of our meeting in 2010, a third farmer was providing summer grazers (and had been for the last two years; distance to farmstead approximately 23 km).

The farmer on the farm LUF 3, after thirty-one years with his own cattle, has leased out the land, and as there are no pastures, there is no need for grazing. On this farm, no step-by-step withdrawal occurred: the farmer couple stopped abruptly and retired. The couple originally came from outside the region, which only few of the farmers on the *land use farms* did; the farmer had had non-farming employment for several years, while his wife worked on the farm during the first eighteen years after they settled there. Thereafter they both worked on the farm for thirteen years up until their retirement, first with dairy production for five years, before switching to beef for another eight years. The farmer reports that they had some 100 head of livestock the year before they finished with animal husbandry (which had consequences for the tilling work on a rather large but fragmented farm domain, on the issue of farm land fragmentation, see chapter B2). The last farmer in the table also stopped abruptly with animal husbandry and farming; farm management has been taken over by the son from a neighbouring farm while this farmer remains living in the farmhouse.

The descriptions of the solutions that enable farmers to continue living on their farms indicate that most of the arable land on these farms with long 'farmer continuity' has kept its land cover status as open land. This has been achieved by letting land management continue less intensively combined by keeping suckler cows instead of dairy cows, or by having (parts of) the time demand of the openness of land covered by other farmers.

B.2 Tilling Work

This chapter goes on to describe land use activities placed in the timespace that is described by the *process landscape* framework (see Part A). The discussion looks from an activity perspective at the issue of 'farm-internal transport costs' that arise due to the 'spatial dimension of agricultural activities' touched upon by Berger (2001). The topic in this chapter is thus to describe the organisation of farming practice given the fixity and spatial extension of fields as farming spaces and the coupled timespace in which spatial mobility means time consumption. I also touch upon the 'lists of tasks' that have to be performed in sequential order. Carlstein (1982), describing a subsistence farmer, brings to the point what I aim to show for the case of contemporary farming in this chapter, namely:

"Take the farmer (…) who has just planted his annual crop, this being the first stage in one of his projects for subsistence. He is in fact constrained by his own choice and determination to go on

cultivating until the harvest is completed, because if he does not, his whole cultivation project will fail and his subsistence goal will never be reached." (Carlstein 1982:47)

Findings relating to this are discussed in the first part of the chapter; the second part focuses on the related issue of farm domain fragmentation, which has direct consequences for the performance of tilling operations.

Tilling Takes Time – Tilling Mobilities

Land use activities concerning the management of arable land are essentially carried out as transports between fields and movements on fields (the same of course applying to forest management). Transports and tilling movements differ although both describe movement in relation to land. The maximum road speed of a modern tractor is 40 km/h, as a farmer points out, but tilling movements are considerably slower. Ploughing a field is the most time-consuming tilling movement, advancing at 3–12 km/h (Hagenvall & Gunnarsson 2008; the author on the farmers' internet forum bukefalos.com assesses the speed of ploughing at 3–10 km/h, for the quote see Appendix III). When utilizing a plough with a working breadth of two metres, the estimated time consumption per hectare is one hour. This applies only to regularly ploughed fields, and excludes the time spent turning at each end of the field. The intensity of land management, the frequency of ploughing and the shape of the parcel translate directly into time expenditure. The more turns the shape of a particular field generates, the more time will elapse during the tilling of that field. The rule of thumb of one hectare per hour is in sum modified by various factors:

"Depending on the type of tilling activity, the weather and soil conditions, the shape of the field, the size of the equipment, etc., the time consumed varies from one hour per hectare to five hours per hectare." (Hagenvall & Gunnarsson 2008)

The farmer can attempt to manipulate some of these factors to reduce time expenditure, while others are beyond influence. The key difference between these two kinds of mobility is that a road transport obviously has to follow the road, while the path of the tilling movement is not prescribed: any method covering all the land on the field is 'allowed', when keeping inside the borders of the parcel. Tilling patterns provide clues for interpreting farmer perspectives on land use activities – so it is useful that tilling movements over fields leave observable traces on aerial photographs, which I call 'tilling lines'.

Figure 10. Example of Tilling Lines
Background Orthophoto: Swedish Mapping, Cadastral and Land Registration Authority (Use Agreement i2012/927 Lund University).

The example thus represents any field. The tilling lines shown here document a back-and-forth movement and cover the whole field. The movement is obviously determined by the shape of the field; turns are visible near the borders of the field, and some sections may have been crossed twice (encircled, Fig. 10). Outdoor observations, too, indicate that farmers perform a regular back and forth movement over the field, since this minimizes turning and the re-

crossing of sections. Frequent turning can be seen to be both time-consuming and frustrating from the activity perspective (I return to this issue the first chapter of Part C Land Management and Time-Economy). For the tilling movement, direction matters, too: in the photograph above, the lower field has been tilled in the direction offering the longer furrow-length and the minimal number of turns. The goal to till the land "*in the other direction*" (farmer interview) was offered by one farmer as a reason for the plans on newly purchased land to remove subdivisions created by open ditches in the field, with bushes and trees growing in them. These would be cleared and the ditches replaced by subsurface drains (Farm Land Map Farm CF 8, Appendix V). This means that the field will constitute a farming space in 'one piece'; such a single piece means fewer turns when tilling, and as this unified field will offer a longer furrow length, tilling in that direction will entail even fewer turns. A 'good cropping space' is a field that is in one unbroken piece and is 'properly managed', as a retired farmer wife explains:

"That field is very good; it used to be divided, with bushes growing on it, but my husband has worked to turn it into one whole piece" (farmer interview).

The shape of a field can obviously be manipulated in order to influence the length of the tilling lines, while obviously the qualities of the tilling lines will depend on aspects such as the size of the farm domain, its spatial distribution, and the type of farm activities. I take this to point at more than a kind of general desire to rationalize land management and would suggest that in farming having control over time is at least as important as having control over a territory. Time consumption in part can be controlled by an appropriate organisation of land. It appears from the interviews that this kind of rationalisation is important on all kinds of farms. Transports and tilling movements over the land take time whatever the size of the farm; clearly, when spatial distances are being covered time is being 'invested'. Via the necessity to engage in such mobilities the farmer is confronted with the timespatial conditions governing material entities. Farming as spatial practice and as embodied activity brings together time and space. Considering the spatial character of land use, the statement provided by one of the pilot interviewees makes sense: "*Time is the single most important resource a farmer has got*" (pilot interview). Distances and the particular temporalities experienced in relation to the spatial distribution of fields (which I continue to discuss in the first chapter of Part C) despite of the large achievements in farming technology and the security and comfort of farm work during the last decade or so. The experiences made in relation to time and temporality appear to represent a concern to modern farmers. It is accordingly precisely 'time' that is targeted by the various 're-moving' operations concerning managed land. I discuss these in the later chapters on forest clearance and domain management.

Tilling Sequences

The tilling operations further show a sequential order that is typical of any 'goal-oriented human behaviour' as discussed in Part A. The goal of tilling normally is to generate a produce from the land possibly via animal husbandry. In this section, I discuss the timespatial ordering of farming, a specific of rural land use activities as spatial practice, i.e. human activity performed in timespace. Farming comprises an interaction with the crops and farm animals. Besides striving for regularity of tilling movements, and as large and well-shaped fields as possible, farming activities are therefore coordinated to match temporal cycles of growth and maturing in crops

and livestock. Tilling activities display sequential order that results from what might be called the teamwork of cropping and animal husbandry: The farmer is only one of the team players, and his or her 'time in use' has to be orchestrated with the 'times' of crops and cows.

Orchestration of the farmer's time implies, for example, that fields should be visited at the right time in relation to the development of the crop, so that adequate tilling measures can be performed. This places demands on the organisation of activities and resources on the farm, besides demanding observation from the farmer. As well as being carried out in response to observation and evaluation, tilling activities follow established 'recipes' and timetables for the sequential organisation of activities on the land that are consulted each season. As an example, together with the farmer on one of the farms studied I have compiled a 'tilling sequence' (Table 6). This example relates to the management of hayfields and pastures. The example displays various tilling measures performed in a sequential order, which is adapted to the particular type of land use, in this case, hayfield and pasture management. The measures undertaken depend on soil properties and the phases in the crop rotation. When the hayfield is to be refreshed, i.e. the hay established anew, the first measure is to bring manure to the field, and spread the manure on the field (sequence A). Thereafter, the hayfield receives different tilling measures – a figure that excludes in-between waiting periods, while the crop grows (see Table 6). The phase "*the crop grows*" was included by the farmer into the sequence, indicating that this is an active measure, performed by the crop and not by the farmer, but as important. The sequence comprises three hay harvests, whereby the first harvest contains the barley or the oats. The field may then be left to "stabilize" before the intensive cropping with three hay harvests is initiated the year after. From now onwards in the rotation cycle, the same parcel will be visited fourteen times during the growing season (sequence B).

Given the time tilling takes in relation to parcel size, covering a whole field might not be possible without pausing (driving home and returning). Moreover, sometimes things break or are forgotten. On this farm, the reaction to such unexpected occurrences can be a phone call to the homestead, to get what is needed delivered (by car). The management of pastures (sequence C) contains measures taken before the cattle are brought to the field, and then continues with daily supervision and water delivery, as well as transfers of the cattle from one pasture to another, all of which applies during the grazing season. In practice, the number of visits to single fields will vary according to concrete situations; thus the specified measures represent sequential steps needed in land management. Each tilling sequence has a temporal shape that can also be approximately accounted for in relation to objective time, as is indicated in the columns (Table 6). There are usually four to five weeks between the first harvest and the second, and when the hay is cut, it is left lying on the field to dry for three days. Each sequence also displays a logical order of operations: for example, one checks the fences and then takes out the cattle; one presses the bales before fetching them. Finally, the exact day on which the various tilling measures are implemented depends on the farmer and the crop – the farmer has to fit in the activities with the rest of the running the farm; and in addition, the crop is influenced by the annually varying conditions for growth, which the farmer then also has to cope with.

Tilling the Farm Domain

This section puts the tilling practices in place on the farm domain. The coordination of tilling

operations on a larger farm such as the one used in the tilling sequence example appears a combination of *ad hoc* and planned measures even over the course of just one day. If one attempts to gain an overview all visits to all the different fields on the farm domain during a complete growing season, or even during a single week, then the tilling mobilities are extremely complicated to account for. The farm land map is a useful aid for simply reflecting over these mobilities (Fig. 11). Each season on this farm, approximately 10 % of the cropland is ploughed to refresh the hay; with each new season, the hay on a new set of fields in other locations will be refreshed. Concerning the choice of fields here, the farmer relates that at times it is necessary to start anew already the second year if wild boars have been digging in the soil too much (see next chapter). During the particular season studied, six parcels (9.8 ha) were refreshed (see Table 6). These six parcels are not located adjacent to one another (see map, "code 80").

Table 6. Land Management Activities Organised in Tilling Sequences.
Explanation: the table is designed following the logic of time-geographic notation. The tilling operations belonging to each sequence advance upwards in the respective column representing the measures undertaken on specific fields. The oats (no. 5 in the sequence on the left) are not grown to full maturity, which is why threshing is absent from the sequence.

	17	fetching bales					
	16	pressing bales					
	15	cutting (depend. parcel qualities, october)					
		the crop grows	14	fetching bales			
	14	fetching bales	13	pressing bales			
	13	pressing bales	12	cutting			
	12	cutting (4-5 weeks later, august)		the crop grows			
		the crop grows	11	fetching bales			
	11	fertilizer (N_2)	10	pressing bales			
	10	fetching bales	9	cutting (5-6 weeks later)			
	9	pressing bales		the crop grows			
	8	cutting (turn June/July, three days in rows)	8	fertilizer (N_2)			
		the crop grows	7	fetching bales			
	7	fertilizer (N_2)	6	pressing bales			
	6	tumbling (in Swedish trumla)	5	cutting (turn May/June)		fetch in the cows	
	5	seeding/seed drilling, oats & grass seeds		the crop grows		pasture transfers	
	4	harrowing & collecting stones	4	fertilizer (N_2)		daily control	
	3	ploughing	3	tumbling		take out the cows	
	2	stubble cultivation	2	[grass]harrowing		[grass]harrowing	
	1	manuring (P K)	1	manuring (P K)		check fences	
sequence		A		B		C	
parcel area in sum		9,80		65,83		45,09	120,72
mean parcel area		1,63		2,14		1,88	1,98
no of parcels		6		31		24	61
		counts heads and checks for crop ripeness					

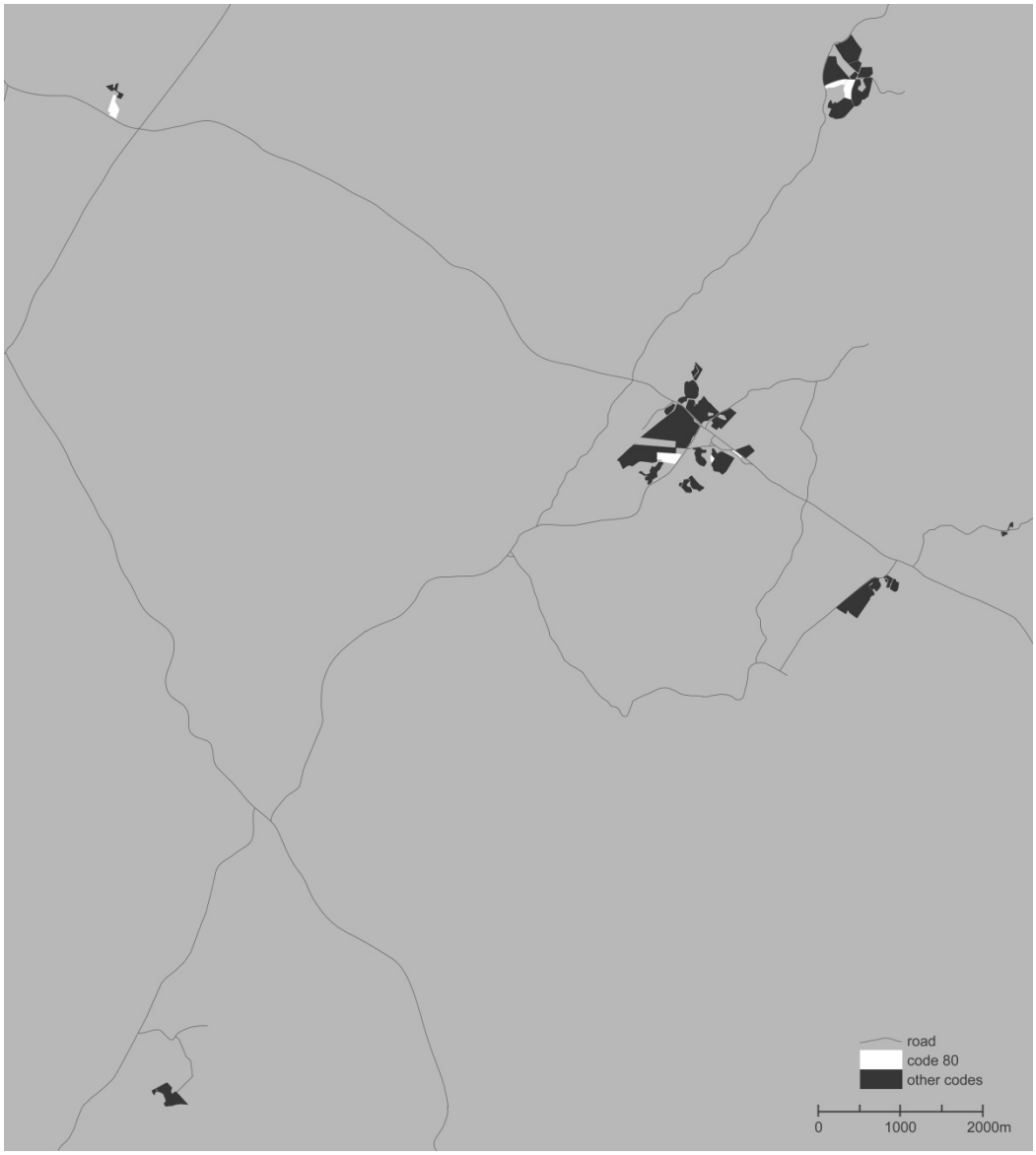

Figure 11. Farm Example Spatial Distribution of Fields to be Ploughed (Code 80)
The maps displayed in the thesis have been produced by the author. The maps have been drawn based on three types of source material: Paper copies of the Parcel Maps produced by the Swedish Farm Payments Administration (made available by the interviewees), colour copies of the farm estate property from the Index Map in the Real Property Register, and digital geographic information from the Swedish Mapping, Cadastral and Land Registration Authority (Use agreement i2012/927 Lund University).

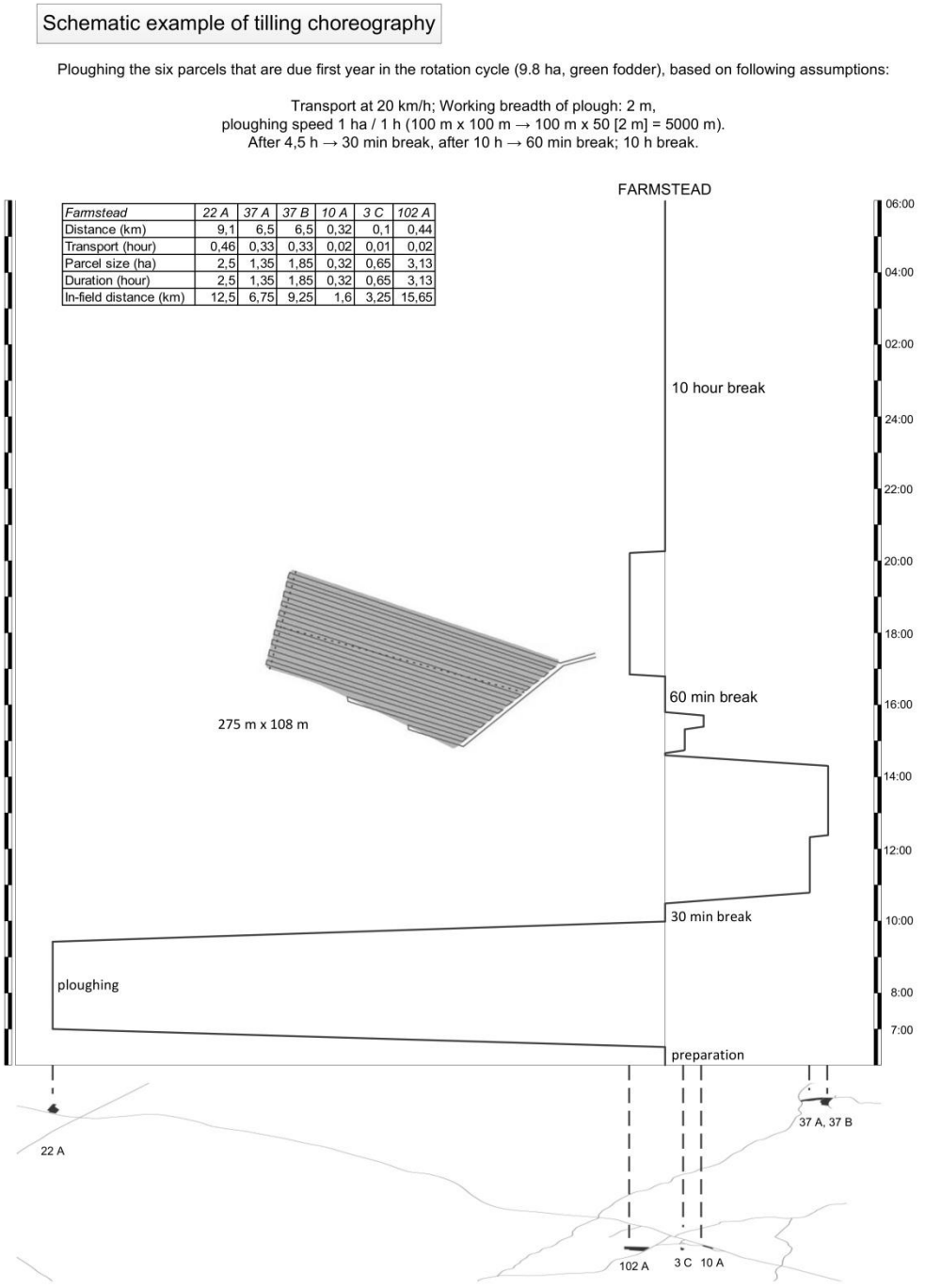

Figure 12. Tilling Choreography

See figure for explanation of the assumptions made in this schematic illustration. The field shown enlarged in the middle represents the parcel 102 A, depicted as a station on the map below the notation.

I have produced a notation-based illustration of the tilling choreography performed when doing the ploughing, which is the first measure in the tilling sequence of these six fields (Fig. 11). The schematic representation is based on assumptions (detailed on the figure) and does not more than to resemble the real time allocation to tilling activities; I assume that nothing else is done than ploughing one day; the illustration aids reflecting over the mobility and time expenditure associated with tilling. Possibilities for co-ordinating tilling operations on neighbouring fields might arise, if the sequence and the implement involved suit the situation on the field.

The aim was especially to convey on-field distances – this is shown as a vertical line – the two-dimensional representation of this together with the road transports proved difficult. I have therefore placed one field as an example of the on-field mobilities in the middle of the picture, while the continuous line of the notation depicts the road transports. Again, this does not show the full number of tours over the land, it should be fifty of them when utilizing a plough with a working breadth of two metres as the field breadth is c. 100 metres. Hägerstrand (2009:109ff.) maintains that by using the notational technique, processes on different scale level would be possible to represent in one figure, one should be able to move between the tiny and the giant, as he says. As long one strives for consistency in the units on the space and the time axis this was difficult to accomplish.

Parallel to the running sequence of green fodder on six fields, the rest of the fields are also under active management. In the growing season studied, thirty-one fields were to be managed according to the basic management sequence on hayfields. Cattle were put to graze on the remaining twenty-four fields classed as pastures. The daily visits to pastures for cattle supervision (often by bicycle) are utilized by the farmer to check the ripeness of crops along the way. Ripeness can also be assessed when tilling nearby; depending on the season's spatial distribution of crops and grazing areas, extra visits might again be necessary to check crops. The sequential interaction of the farmer's own measures with the crops' development, and the cattle's, combine to create a time prescription. This time prescription is determined by (the project of) having cattle (not to forget the projects of authorities of which the inspector is but one manifestation, arriving to verify that the cows' statutory two yellow number tags, one in each ear, are in place). This is very similar to the situation of the subsistence farmer who figures in Carlstein's (1982) example, quoted in the first part of this chapter. If the daily, seasonally and annually 'prescribed' activities are not performed, the whole cultivation project will fail and the farmer's livelihood goal will never be reached. On this farm, the management of the time prescription is achieved by allocating two persons' complete time incomes to these farming activities. Furthermore, on this farm, the orchestration of on-farm tilling activities must be combined with regularly fetching straw and calves from outside the farm domain. Straw is brought in from four different farms at distances of approximately 34 km, 34 km, 31 km and 15 km, respectively; and calves are brought in from the first farm, too. To remember here is that tractors have a maximum road speed of 40 km/h, and the speed will be lower when towing trailers loaded with calves or straw.[49] Various

[49] Again, obtaining a detailed diary of the time usage on a larger farm would be extremely interesting. I had prepared a diary for three days only, but still the farmer found it difficult to make notes while tilling and moving between fields. As I and other researchers interested in time-geography have tried to keep time diaries of our own and encountered similar difficulties, I can understand the farmer

additional transports are needed with a frequency of less than once a year, for example to fetch fodder. While the previous season's hay harvest was sufficient for the cattle's winter needs, the season before had been so poor that the harvest did not meet fodder requirements; additional hay bales had to be purchased from a farm at a distance of 65 km – nothing was available closer-by. The farmer was able to cooperate on the transport with a fellow-farmer, and they hired a lorry between them.

These are the very foundations of the business of land management. A tilling sequence shows how, from the farmer perspective, actions are planned and performed in order to cater for the goal-situation of the harvest to appear, in part in adaptive response to other entities' times. On an 18th century farm, land use activities such as harvesting hay and cereals by scythe on infields and grazing cattle on outfields alternated similarly with the vegetation growth curve on cropland and meadows (Ekstam & Forshed 1996:35). The intricate interaction of crops, cattle and farmers steering each other has apparently not changed despite technological and socio-economic changes. A tilling sequence points at the relationality present in farming as a timespatially ordered activity. It is clear that the order required in tilling activities also steers the farmer's paths and time allocation.

Spatial Shape of the Farm Domain

On a contemporary farm with large-scale production, the farm domain may display a significant spatial extension. The fields will be more or less compactly distributed. Accordingly, land management entails many types of mobilities and the covering of many transport kilometres between discrete stations at which land use activities are performed. Such stations embrace the fields, the cowhouse and the pastures (when running a cattle project), the farm office and various farm buildings, the farmhouse kitchen, and so forth. Generally speaking, a land use setting is differentiated into various stations located at various distances, and the ordering of land use activities takes the form of complex sequences covering the whole of the farm, all aimed at achieving specific goals (here: enacting the goal-situation of the farm project, as discussed in Part A). The time demand of activities carried out at these various kinds of locations will depend on a number of *spatial* factors, besides of depending on the types of project-goal followed and the farmer ambition level. Such spatial factors comprise: the specific routes to these specific locations, i.e. the farm-internal distances, and the size and shape of fields. Therefore, the total time demand of farm management will reflect the spatial shape of the farm domain as a whole – an obvious, basic observation but one that has significant consequences for farming. I return to discuss this issue in the next section.

Since the tilling operations implied by land management consume time, a farmer may, in order to 'save' time, contract out certain land use activities; this is something many of the part-time farmers on the land use farms do: they lease out single tasks or fields, for instance.

very well, although I had hoped that my rather simple design of a pre-filled diary would be manageable. Other solutions, such as observation, can surely prove useful in future studies.

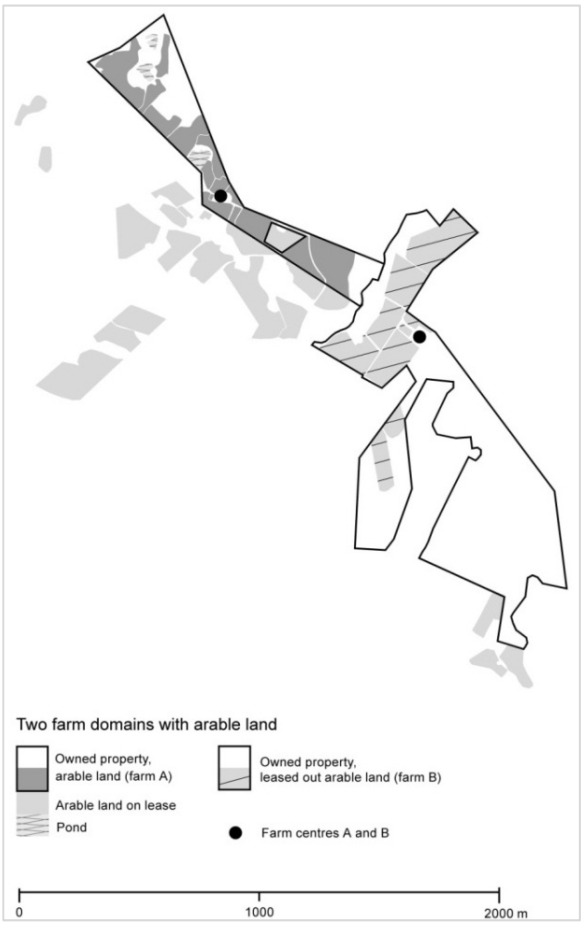

Figure 13. Shapes of Farm Domain

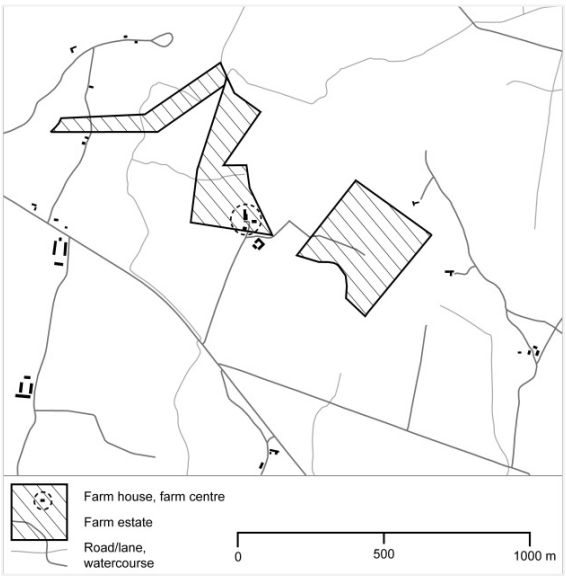

Figure 14. Fragmentation of Farm Estates (example)

In this way, the farmer remains 'committed' to a particular mode of land use but gains time which can be invested in a more profitable external job. Bringing in external 'time resources' also makes it possible, given a decrease in physical capacity to engage in farm work with age, to re-orient the farm project without sacrificing the objective of "*keeping the landscape open*" (farmer interview). Such external time input might, or might not, consume economic resources. More often than not farmers explain that they devise solutions, which save money due to an exchange of services. One might recall here that the household/business level of which a farm is an example has the character of a free sector (Hägerstrand 1993), which means that there is scope for individual solutions. One specific variation of these exchanges of services, possible since the agricultural reform in 2005 (I return to this further on), is to let the leaseholder harvest and keep the grass, while the landholder receives the agricultural subsidy per hectare. This emphasises the benefits a landholder can gain from arable land without own active engagement as farmer in land management.

The shapes of the farm domain and the farming situations on the *land use farms* vary considerably: Two more farm examples demonstrate the variety encountered. The farm domain A is managed part-time with the additional use of contracted input of time, the arable land on farm domain B is run by a leaseholder farmer (Fig.13). On farm estate A, the farm project is about cattle husbandry and about living-in the calm and silence of the rural countryside with its vivid and stimulating nature. There are forty suckler cows with on-farm recruitment of calves, which is possible only due to the farm domain extending on leased-in land. The land leased is located in the neighbourhood but the tendency towards a scattered domain is visible here (see Fig.13),

albeit to lesser degree than in the example earlier. The farmer utilizes a contractor for most of the tilling operations, and buys in 30% of the cattle fodder on regular basis. The farmer decreases his own time input in the farm by bringing in external time input and time 'packed' in the fodder purchased such that his own doings are oriented towards daily cattle management and some tilling operations. This is what works well on a part-time basis. When an opportunity to lease land turns up, then of course you take the chance, this farmer says, and after extending his acreage in this fashion he subsequently increases the number of cattle accordingly. The farm land primarily functions as a grazing space, with some fodder production, too; the major part of the forest land is used for forest grazing (the white areas). 'Proper' forest covers only 1 ha.

On farm estate B, the arable land is leased-out on a long-term lease to a full-time farmer (with a distance of 19 km between the farmsteads); the landowner keeps the agricultural subsidy. Two larger forest properties are held separately. The farm functions and is valued as a home, with inheritance values connected to the property. The landholder moves over the land mainly during leisure-time walks, while the arable fields of the farm constitute distant stations in the lease-holding farmer's timespace choreography.

The obvious question, when observing the farm land maps, why the farmer on the farm A does not lease in land from farm B can only be tentatively answered on the basis of indirect information such as the leaseholder on farm B being a relative of the landholder.

To summarize, and to re-connect to the theoretical discussion in Part A, we can say that the farmer's path over the land reflects an orientation of land use activities that is determined by the ends and goals of the farm project; noteworthy is that in this, the path is steered by the geography of the farm domain. The farmer goes where the land is and connects the materialities of the farm domain with the ends and goals envisioned in the farm project. The tasks thus carried out attempt to bring about the 'goal-situation' that characterizes the farm project.

Fragmentation and Distances

The geographical fragmentation of farms with consequences for land management and the farmers' time-budget may start already within the owned territory; farm estates often consist of spatially separated parts even before additional land 'somewhere else' is leased in. An example of a farm domain that consists of a single farm estate but displays three parts (Fig.14). When land is leased in to add to a farm domain, the geographical fragmentation increases, unless the leased land is located immediately adjacent to the land already owned, thus allowing for a concentric expansion of the domain. Adjacent land does not regularly become available. The factors governing access to land appear to be neighbourhood-specific. While several farmers told about an unwillingness of landholders to lease or sell land to immediate neighbours, others reported the opposite such as the land purchased to be cleared on the farm CF 2 (this case is discussed in chapter B6). The farm neighbourhood is clearly important, when reflecting over the issue theoretically: a farm will always be situated in a specific neighbourhood and its access to more land besides of what is owned depends on the situations of the neighbours, in how far they need their land themselves or already leased it out to other farmers. In this way, the surroundings of farms can be seen to be 'packed' more or less tightly. The degree of packing then allows for more or less dynamic between landed territories (this

topic is continued in Moving, Placing and Gathering Land).

Often the land that actually becomes available to be gained to the farm domain is located at a distance. The following statement exemplifies a situation common to many interviewees:

"We had some fields on lease on a farm at [a place 8.5 km away], but all that extra driving was hard work – it's best to have all your fields adjoining" (farmer interview).

A full-time farmer engaged in dairy production told me of his experience of leasing 25 ha of good, level land that was free of stones and spatially compact. However, this land lay at a distance of 45 km… After a few years of reflection (!), the farmer accepted the offer and leased the land (after meeting a farmer-colleague who told him he himself had parcels on lease 80 km from the farmstead).The driving to cover these 45 km took precisely one hour each way. Bringing home the bales of fodder could be organised at reasonable cost with a tractor and trailer, whereas transports of manure proved to be the crux, becoming simply too expensive from this farmer's point of view: manure transport is due every fourth year when the land is ploughed. The lorry contractor charged SEK 1000 for each trip; his lorry had a capacity of 20 cubic metres, which is the volume of manure needed for one hectare – and the lease-held land covered 25 ha in total. As well as this, the fuel cost of driving to carry out tilling operations proved prohibitively high. After only a few years, the lease agreement was terminated. This experience shows how the weighing up of whether something is 'timespatially doable' must include an evaluation of parcel locations in relation to the farmstead. Manure transportation was a frequent topic in the farmer interviews – ferrying manure over large distances viewed as "*sheer madness*" (farmer interview).

The dairy farmer mentioned above who had leased land a long way away, offered distances as the main reason for clearance projects on the farm (the placing of clearings is discussed in the section Where to Place New Land?). This farm domain consists of seventy-four parcels and is among the most fragmented of those observed in this study in terms of distances between parcels (Farm Land Map Farm CF 1, Appendix V). The fields under management are spread out diametrically from the farmstead with many transport kilometres to be covered: Arable land shows a concentration close to the farmstead, but some 15 km away there are both single parcels and "*whole villages*" (farmer interview) which are managed on lease. This situation can be contrasted against that of the farm CF 11, displaying a compact farm domain (Farm Land Map Farm CF 11, Appendix V). The placing of clearings on the former farm manifests the attempt to overcome distances by 'moving' land closer to the farmstead. While we do not know the circumstances of the farmer-colleague with leased land 80 km away from his farm in the example above, the farm CF 5 provides an example of acceptable distance. The farmer on this farm manages a more compact farm domain that includes three fairly large parcels of leased-in land at distances of 4 km, 7 km and 9 km, respectively (Farm Land Map Farm CF 5, Appendix V). In addition, four parcels on lease locate at "*a large distance*" (farmer interview; the distance is 22 km). The farmer explains that the reason for keeping these parcels is that the soil is favourable for growing vegetables, which make an essential part of the farm project. Distance to fields appears relative; in addition, 'large' distances may be acceptable if there is something to gain from a remote field that is not available from a field closer by such as many hectares plain soil, or good vegetable-soil.

Land management on lease also entails the management of contacts with several landholders with whom a variety of lease and management agreements – both formal and non-formalized – are held. Some farmers view leasing as insecure (see also the chapter B7). Others utilize leasing arrangements on a large scale, such as the farmer in the tilling sequence example. For him, keeping in mind all the small patches he is responsible for when doing the tilling work is a task in its own right. He relates that he attempts to cover the patches systematically starting at one end of the farm domain – once however, he tells me, he forgot one little field and had to drive all the way back to till it. Leaseprovider expressed some ambivalence towards lease as a land management solution. A retired farmer stressed that he was unwilling to sign formal agreements to lease out land due to the risk of difficulties when wanting to reclaim the land. A landowner who leases out land faces the uncertainty as to whether or not the leaseholder will take proper care of the land. A part-time farmer who keeps sheep and leases out most of her arable land says that the leaseholder has mismanaged the land; another landholder with external income and leased-out arable land says that the leaseholder has not done more than the bare minimum. Obviously, a farmer who proves himself to be a 'proper leaseholder' will receive additional offers from neighbouring landholders, as they perceive that he does a good job of caring for the land (as explained to me by a farmer). For the leaseholder especially, non-formalized agreements are insecure as they can be withdrawn at any time. Overall, acquiring land becomes an accomplishment and, it seems, farmers tend to accept any offer to take land on lease (irrespective of the type of agreement).

The discussion thus far has showed that land use as mobility, due to the coupling of time and space, together with the scale of arable production are interdependent with the time expenditure in farm management. Intensive land management necessitates many visits to single parcels, whereas less intensive modes of engagement with the land perhaps only demand one visit annually to a field. The transport part of the mobilities involved depends on the spatial spread of lands belonging to one management unit. The fragmentation of the managed domain may increase dramatically when land is leased in.

In this context of fragmentation of the farm domain, a further farm example illustrates the importance of the relative locations of farmstead and managed parcels. A change in perceptions concerning the placing of fields relates here to a change in incoming time. On this cattle farm, CF 9, with suckler cows, the beef project run on the farm aims at making a living from farming. When the farmer's two sons became involved in the farm, plans were made to increase production to support the three of them. Since the planned increase from 60 cows to 110 demanded more arable land, forest land under the farm's ownership was cleared at three locations (Farm Land Map Farm CF 9, see Appendix V). The farmers embarked on the three clearance projects additionally to the beef cattle project. When the clearance projects were introduced, two cowhouses for the cattle were maintained on the farm, one in the north and one in the middle of the farm domain (see farm land map). At that time, keeping cattle in two sheds seemed manageable, and the plan was to enlarge the cowhouse at the central farmstead. When the father unexpectedly died, this altered the time-economy on the farm. The cleared parcel in the north, adjacent to two other parcels and with direct road access, is now perceived as distant, although the farmer interviewed himself lives at the northern farmstead:

"It feels like the wrong place, it's so far away from the cowhouse. We'll probably let it grow back

again, it's better to have it as forest" (farmer interview).

In the new situation now pertaining, it feels too time-consuming to have cattle in two places; in addition, the farmer explains: "*We've stopped all extras*" (farmer interview). The loss of one full-time time input for running the farm with on-going commitments altered the location of the particular clearing from quite near to rather distant. I take the re-evaluation of the clearing in the north of the farm domain as peripheral as rooted in practical knowledge of the farm's time-demand, representing a reaction to the loss of hours available for farm management. It highlights the importance of time expenditure in balance with time income.

The farm example CF 9 is also useful in indicating, why some farmers embark on clearing land rather than, if possible, seeking other solutions in the neighbourhood. The farmer suggested that "*our father was fond of clearing*" (farmer interview), and pointed out several completed clearings, mostly for pasture use, some of which were adjacent to current clearings; he also maintained that the father saw the clearance projects as a way of "*having one's own arable land and being free of having to pay leasing yearly*" (farmer interview). Thus the (commitment to) a certain line of action is balanced against the time income, but an assessment of what seems possible is additionally influenced by individual energy and individual choices of strategy in farming.

Various spatial shapes of farm domains are included in the material. The farm land maps (see Farm Land Maps CF 1 to CF 11, Appendix V) display a variety of spatial fragmentation with the arable land owned or leased located in various places; the degree of fragmentation varies such that some farm domains are very compact with contiguous fields. The distance to parcels depends on the road network, and if the disposition of roads is unfavourable, this may well add to the fragmented character of the farm domain from an activity perspective. An interpretation of the farm land maps and farmer interviews from the point of view of materiality and activity indicates that the degree of fragmentation exerts significant influence on the farmer's time-economy. The exchange of a leased-in field to a cleared field near the farmstead may significantly alter the timespatial choreography of land use activities on the farm domain (this issue is discussed in more detail in B6, section *Distances*).

The size of farm domain needed to be viable today clearly exceeds what was sufficient only a generation ago, as a comparison between reports from the land use farms and the clearance farms indicates. This has been a step-by-step development. Two farmer couples, moving towards retirement and still engaged in farming, point out that they actually used to manage, or are currently managing, three families' farms, despite of which they deem the returns would not, or did not, suffice for full income. The farmer couple now engaged in beef production and planning to retire used to manage, when they were engaged in dairy production, two farms that they owned and a third on lease. The other farmer couple, with cattle on a hobby basis, similarly manage 'three farms'. Another recently retired farmer relates that their farm was a large farm when they were active just a decade ago; and yet another reflects along the same lines, although he and his wife never became farmers due to twists of fate, and the management of their arable land has been leased out. Another retired farmer describes a fragmented situation already during the end of his active period in the early 1990s. He relates that he did manage on lease all the arable land on the farms and crofts along the road to the neighbouring parish apart from one, and that in

addition he leased and managed two more farms in another direction. On four of these leased-in farms the farmer kept cattle besides having cattle "*at home*" – meaning, as he describes it, that he "*had to drive around to feed the animals*" (farmer interview).

What the fragmentation of farm domains implies for land use activities is that more time has to be allocated to road transports between the fields and the farmstead and less time is available for on-field operations. This makes the size and spatial shape of the field a target for rationalisation, I would suggest, as time gains can be made here, whereas it is difficult to move land closer if such is not available there. What thus matters in land management from an activity perspective are parcel sizes, the number of parcels, and distances between parcels, i.e. the degree of concentration of arable land close to the farmstead. The spatial fragmentation of farm domains appears to be of particular concern to farmers whose goal is to have farming as their livelihood. In today's world, viability in farming requires large-scale production, i.e. a large managed acreage; the crucial question, from the full-time farmer's time-economic perspective, is where this land is located.

Near the Cowhouse

On farms with cattle, availability of grazing land near the cowhouse is of practical importance, as any distances involved here require mobilities, which might prove disruptive, such as daily transports of dairy cows. A retired farmer reports that "*the cattle had to be driven around a lot*" (farmer interview) due to the compact situation around the farm, which is situated in the middle of a village with many farmhouses. In this case, the scale of production, the numbers of cattle and the spatial preconditions do not match. Similar pertains to the previous situation in the case of the farmer who "*had to drive around*" (farmer interview) at lot.

Dairy cows especially should be 'available' near the cowhouse as they need milking twice a day, also while on pasture during the prescribed grazing period. This, the farmers explain, may lead to the land utilized for grazing near the cowhouse being kept longer than other fields before its next ploughing, due to the convenience of direct access or as a back-up in case of a dry summer when semi-natural pastures risk drying up. On farms with cattle, land in proximity thus tends to be used for grazing, while land further away is used for fodder production. Even if beef cattle, especially younger stock, can more easily be spread out on pastures further away, "*pastures close to 'home' save time*" (farmer interview), with regard to the daily supervision of livestock.

Increasing dairy production by increasing the number of dairy cows may therefore face a spatial obstacle, as livestock density on grazing land should not be too high (due to environmental regulations). This is the case on the farm CF 2. On the farm CF 1 the farmer explains that the two recent clearance projects were carried out with the objective of creating more grazing space near the farmstead in conjunction with adding another ten cows to his dairy herd – more land was needed near the cowhouse. In a similar vein, the farmer on the farm CF 9, although not engaged in dairy production, explains that the rationale behind the (placing of) clearings was to gain manure-spreading area close-by.

B.3 Non-farming Activities, New Crops and Invasions into the Farming Spaces

The possibility to support the farm economy with returns generated by other farm-based activities might positively influence the ability to maintain land management. The inquiry concerning diversification of the farm economy on *land use farms* (for the Observational Guide, in Swedish, see Appendix III) shows that farmers rarely engage in anything other than those activities that immediately deal with cropping and animal husbandry. Moreover, the crop choices tend to be 'traditional' in that only rarely do these farmers start growing new crops. The findings concerning non-farming activities and crop choices on *land use farms* are discussed in the first part of this chapter.

Furthermore, the farm projects are influenced by what I have come to call invasions into the farming spaces, which necessitate adjustments in the farmers' land use activities. Arriving at one's goal depends on oneself, but also on others, one's own movement and others' movements. Farmers engaged in farming for their livelihood depend on the land as a resource, and attempt to organize the farm space to promote output and farm-income. Arable land as an asset in agriculture appears however a sensitive factor as the land lies open, rendering it vulnerable to influences the farmer cannot control. The changeability of the weather is the classic 'invader'; in this regard, I have observed the rather similar effect of wild boars, and also an invasion of mental and economical kind, namely the frequent comparisons of their levels of yield and farm returns with other places, which I take as induced by the global open market situation. These findings are discussed in the second part of this chapter.

New Activities in the Farm Timespace?

In all the *land use farm* interviews, I inquired about new projects on the farms, such as further processing of agricultural produce, tourism or visitor activities, renting out stabling space, and so forth (see Appendix III, Observational Guide, *land use farms*). The meagre result is stabling for horses on two farms: on one of these farms, stabling has been hired out continuously, with a recent expansion in this business; on the other farm, stabling was offered in the past. On a third farm, rooms have been let for visitors. In addition, canoeing activities are offered on one farm by the son, and by one farmer among the additional farmer contacts. The farmers do not engage in a variety of projects on their farms, but appear to 'focus' on those land use activities that serve the goal of feeding farm animals. The interview findings correspond with the 'study circle' results concerning application of strategies for enhancing the economic viability in farming. The farmers, choosing among pre-given alternatives those applied on their farms, predominantly reported that they had 'increased production in existing branches of business' and 'increased the efficiency of farm management'. Several farmers have stopped keeping pigs and/or growing cereals thus applying the strategy 'quitting part of production', whereas the rest of strategies listed ('increasing labour input', 'starting a new business', or 'collaborating with other landholders') had been scarcely applied on their farms. One full-time farmer collaborates with a colleague from the neighbouring parish, and another full-time farmer receives some help

with practical matters from a retired neighbour. Annual crop choices can from an activity perspective be seen reasonably steered by previous lines of management. Continuing on the same path – i.e. leaving the timespatial allocation scheme of the daily incoming time resource more or less unchanged – is less demanding than including new activities (occupation packages) and/or upholding a variety of engagements.

I also inquired about crop choices on the farms, asking about both traditional and newer, less usual crops, offering examples such as hemp, reed canary grass, maize, or even willow, which are often discussed as options for farm-based biomass production. However, implementing new crops seemed to be far from the top of the agenda on the farms studied. A retired full-time farmer now engaged part-time in farming reports that the crops on the farm were hay and straw for farm animals: he had not thought of introducing any new crops:

"No, I've never seen any point in that. Things like that aren't relevant here; nobody round here has those kinds of crops. I haven't even looked into any options" (farmer interview).

Some 'innovative' planting choices were encountered on the forestry side, with farmers who have planted larch or aspen. The crop choices on the *land use farms* appear based on the farmers' explanations also during the 'study circle' to have much to do with what is perceived as suitable or traditional – namely animal husbandry and fodder crops (the statement 'in this region, it is a tradition to have hay on the fields' received broad support). Such 'tradition' last to the 1970's, in the decades before that the crops grown in the area included not only cereals, but also potatoes and sugar beet on large scale. In the future, canary grass or hemp might win terrain. A 'traditional' crop choice obviously has a social dimension, as crop choices made by neighbours were mentioned as a factor in reluctance to branch out into anything new.

In one of the interviews, I received an identity-related, detailed explanation as answer on my questions about ventures such as running a farm shop for farm produce, thus providing more insight into the 'reluctance' of farmers to engage in various farm-based activities other than farming:

"That kind of thing isn't anything for us, I don't want [to run] a farm shop or [have] guest rooms, that isn't why I'm a farmer. Being a farmer is a profession, (...) Calling it a profession is nothing negative, what I mean is you live with it all the time, it's a way of life" (farmer interview).

Farming and engagement in agriculture are career choices amongst other career choices that combine livelihood with a rural lifestyle. Indeed, as it would be peculiar to suggest to a teacher that they might earn extra income by offering their colleagues or the pupils' parents gardening advice, or to suggest that a surgeon could open a flower stand at the hospital entrance – so why should farmers embark upon 'all sorts' of other things on their farms?! Uthardt (2009) concludes in his study of Finnish contemporary farms that "*[i]t is necessary for the farmers to be recognised by the community as independent professionals in their own field of knowledge*" (Uthardt 2009:267) – apparently a kind of suggestion that the interviewed farmer was hinting at.

When trying to understand this 'reluctance' to engage in farm-based activities other than farming, the routinesation of land use activities shows itself linked with identity and tradition, i.e. previous paths of action are the ones which are known and socially comprehensible. However time as a factor of importance in its own right makes a resource in farming, i.e. the carrying-out of land use activities; therefore I

suggest that when the farmer is already committed to running the current set of tasks connected to the farm project, there might not be enough time to engage in new tasks, demanding time amongst the existing activities. This means that new farm-based projects simply might not find 'space'. Availability of time connects to strength, since, if one has time (including time to take breaks and to partition the work in small packages) many things could be accomplished. Here, clarification is offered by a farmer on a *clearance farm* who explains the hesitation she and her husband felt before incorporating a new project in their daily business:

"Considering how much there is to do [already], before taking a decision on something new you have to assess whether you'll have the time and strength to go through with everything that that decision would lead to" (farmer interview).

Before new initiatives become routine with a designated place in the temporal order of activities, they will slow down the farmer's doings (i.e. make him/her less efficient):

"*It takes time for new routines to fall into place*" *(farmer interview)*.

This farmer has been developing a new, farm-based source of income: guided tours over the fields focusing on the natural and cultural values present in the landscape. On this farm, pig husbandry was given up and only cattle retained in order to manage the open land, while off-farm income also comes in, and the guided tours part is expanding. Another farmer described the implementation of a new milking system by saying "*the humans on the farm took years to get used to the automatic milking equipment, whereas the cows got used to the new situation after two weeks*" (farmer interview).

In addition, farmers with external commitments correspondingly lack time and energy to embark on any farm-based non-farming project in their spare time. A farmer with the current farm project supported by external full-time income cannot imagine catering for weekend tourists on the farm during his scarce leisure time, nor does he feel he has the time to establish and market any such new farm business, even though the preconditions at this particular farm would be optimal as 'landscaping' has already been carried out to create an enjoyable rural environment. One of the farmers interviewed has however succeeded in making 'use' of the rural surroundings on her farm by offering guided tours focusing on the natural and cultural values present in the landscape. The idea originated from the farmer's pondering on the attractive surroundings:

"It's very beautiful here, but that fact doesn't exactly help me make a living from farming… But I got to wondering how I could get something out of it?" (farmer interview).

On the crop side, the only new departure in terms of farm crops was one farmer's plan to try maize in the coming season, and this would be part of the already running dairy project. The time, but also the knowledge and implements, needed to run the trial will in the main be bought in: almost the entire sequence of activities associated with growing maize were to be taken care of by a contractor with experience of maize projects, who also owns the implements needed for working with the crop. The time budgets of both the farmer and his wife are already allocated to activities connected to other projects on the farm. In this project the resources time, expertise and technology appear to me inseparably intertwined, and prompt the farmer to hire a contractor. If maize works out well, the farmer hopes for an increase in milk production of approximately 10% within a couple of years. However, the new crop's place on the farm is insecure: the successful inclusion of the maize in

the dairy project on long-term "*depends on how I manage it – so it's a bit exciting (…). It's an expensive crop when you take everything into account: the machinery, seeds, and fertiliser, so obviously I'm hoping the project will be a success*" (farmer interview).

Wild Boars and the Open Market

Two examples of disruptive invasions in the farm spaces are wild boars on arable fields, operating as material entities without respect of ownership borders, and the presence of market comparisons in the minds of the farmers, i.e. the recurringly referred to comparison of the productivity of the own lands with the productivity of lands in distant places. Such invasions 'deconstruct' the meaning of 'farm territory' as a space controlled by the landholder agency.

In the region in which the *land use farms* are located, there is since recently a significant presence of wild boars, which cause major damage to the farms' arable fields. Three farmers told me that to their mind, the wild boars are the single biggest change in land use to have occurred over the past twenty years, and a fourth farmer, helping me to classify on the map a particular field on their lands, suggested calling it a wild boar pasture:

"And then we have a piece here, where we compete with wild boars. It's absolutely hopeless, we don't apply for hay subsidy on that patch, because it's all too damaged – the wild boars churn it up something terrible with their snouts, it's not worth sowing anything on it..." INTERVIEWER: *"Hmm, how should we classify that one then?"* FARMER: *"Write 'pasture for wild boars'" (farmer interview).*

Mention is made of increased damage on arable fields in five interviews. One farmer, talking about the damage caused by wild boar to hay fields, told that he has stopped leaving oats in to ripen fully. He said:

"It's become a great concern; they can wreck a whole field in just a few hours when they come in herds of twenty to forty boars" (farmer interview).

Another farmer starts the crop rotation cycle "*where the boars have started*" (farmer interview) and reports that fields need repair after the second season. Another farmer reports having brought in a contractor with a special implement to repair fields, maintaining that properly managed fields are the farmer's responsibility (which reflects the fact that farm payments are an important source of income on this farm – a fact referred to repeatedly by the farmer, for whom it is therefore important to remain eligible for payments). Farmers also mention in this context that it is expensive to renew hayfields and that electric fencing is costly. Others report having fenced the fields immediately adjacent to the farmstead. Concerning the fencing, another farmer maintains that electric fencing does not keep boars off. Nightly hunting sessions or fencing are not realistic options for a full-time farmer, as "*just the fencing by itself would be a full-time occupation, as the fields are so small and spread-out*" (farmer interview). This farmer goes on to argue that "*we small landholders don't have enough land to rent out for wild boar hunting to make a load of money from*" (farmer interview).

The 'pasture activities' of wild boars modify the crop projects on the farms. Farmers adjust mentally and by taking extra measures, which has consequences both on their returns – as produce is destroyed or land taken out from subsidy – and on their time budgets.[50]

[50] Concerning wild boars, a recent report shown on Swedish Television confirms, together with other sources, that wild boars are a large-scale problem in southern Sweden. Three

The second disruptive invasion enters the farm spaces via the minds of the farmers. One farmer for example explains that with his small parcels, he has double the workload of his brother who farms on the plains, and that his yield is only half of what his brother achieves. Given the price levels for cereals and the time input required for tilling small fields compared to large fields, farmers contend, growing cereals is ridiculous, or at least non-viable. Thus the farmers on the *land use farms* describe their 'small' (small-sized) lots and 'poor' yields as constraints and hindrances that prevent them from engaging in certain farming practices. Although the quality of the produce might be good, cereals production has become an impossible option in the minds of the farmers, the same goes for animal husbandry, especially for keeping pigs. A problem several farmers touched upon with regard to both calves and pigs is about when the lorry from the abattoir does not show up, or does so at other times than agreed, which the farmers interpret as that they will not come to fetch just a few animals. One farmer described it as a "*disaster*" if the transporter did not turn up (at the time she was engaged in pig husbandry). Concerning the cereals, the comparisons take in the large, level fields and top quality soils on the southern plains of Skåne, and concerning the animal production the price levels of produce from Ireland, Argentina and Brazil. Comparing local production capacities with places at a greater or lesser distance around the globe may for example make cereals appear a ridiculous choice, despite their having been among the staple crops during previous decades, and despite the fact that the soils are actually well suited to growing cereals. Thinking of these problems via the concept of invasion helps to illuminate the observation that a phenomenon that is felt locally may, and often does, connect to distant places or events (Mitchell 2008; Lambin *et al* 2001). In this way, the farmers are pushed either to adjust and repair the damage or to quit farming, as it is rarely possible for them to maintain several farming-based sources of income.

In one way or another, the material landscape is perceived as a hindrance in itself – though the question then remains as to why farmers do not set about clearing the land, removing as it were the things that are in the way for viable farming. The question appears multi-faceted.

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decades ago, the wild boar was nearly extinct in Sweden. Since then there has been a dramatic increase in their numbers, and major damage on agricultural enterprises caused by the wild boars (Permell 2013).

B.4 Land Cover Changes during 1990-2010, *land use farms*

During the research period, only a few land cover changes were reported on the *land use farms*. These changes represent parcel-level instabilities in the landscape, while their extent is limited from landscape perspective. On six of the twenty-four farms, the farmers reported that parcels had been subjected to land cover change (Table 7, Table 8), while asserting that in the main, the arable land had remained unchanged. These land cover changes comprise both 'openings', following a conversion of land use from forestry to farming, and 'closings', where land use is converted from farming to forestry; the areas subjected to change more or less balance each other out (Table 7).

Table 7. Land Cover Changes, *land use farms*
Data for one afforested field is missing.

Farm	*n*	Type of Land Cover Change	Size (ha)	Effect
LUF 19	3	spruce to pasture	1,3	opening
		forest grazing	0,5	opening
		forest grazing	0,7	opening
LUF 5	2	spruce to pasture	1,1	opening
		birch to pasture	0,4	opening
LUF 20	1	aspen&spruce to pasture	1,6	opening
LUF 17	1	cropland to spruce	2,4	closing
LUF 10	1	cropland to larch	0,8	closing
LUF 7	1	pasture to forest	?	closing
			5,6	sum open
			3,2	sum close

Approximately 1% of the arable land area in 2010 on the *land use farms* has experienced an 'opening' or a 'closing'. From the farm perspective, on the farms, on which the changes have been carried out, the clearings represent a larger share of the farm's current arable land area. The openings account for 1.1% of the arable land owned by farmers on the *land use farms* in 2010, and 9.8% of the arable land owned on the three farms where these changes were carried out (Table 8; see also Table B, Appendix I).

Table 8. The Indicated Landscape Changes
Note that the fact that data is missing concerning the closings lies behind the lower values in the calculations (the farms LUF 17, LUF 10 and LUF 7). The omitted hectares would be likely to balance the closings against the openings.

Owned arable (ha)		
LUF 19 + LUF 5 + LUF 20	57	9,8 % sum open
LUF 17 + LUF 10 + LUF 7	82	3,9 % sum open
LUF farms	496	1,1 % sum open
		0,6 % sum close

To characterize the farm backgrounds to these land cover changes briefly: On the farm LUF 19, almost the entire farm estate has been transformed into grazing space with pastures and forest grazing areas since the farmer couple started in 1990: "*Everything has been opened up for pasture*" (farmer interview). The background to this expansion lies in the cattle project that carries the farm, and the couple's appreciation for a rural life close to nature; they also explain that they have a low level of interest in forestry. On the farm LUF 5, the existing pasture area around the farmstead has been expanded by two clearings for pasture. The most recent (in 2008) is land, which was previously forested with spruce, and has forest on two sides and arable land on the other two: "*I want to have that [land] for grazing*" (farmer interview), the farmer explains, adding that the spruce did not thrive on the gravelly-sandy soil. This is a retired farmer with a long career in farming behind him, and he is continuing with animal husbandry because having cattle grazing the land is more pleasurable than having it empty. In addition, during the interview he repeatedly refers to the importance of agricultural subsidies, so this expansion of grazing area with no mention of a

concomitant expansion in cattle numbers might appear to be reasonable from that point of view, too. On the farm LUF 20, spruce and aspen have been removed (before regular felling maturity) to enlarge an existing pasture area directly visible from the farmhouse; the farmer envisions a group of birch trees and some solitary oaks. The goal of this enlargement is to create a more pleasurable landscape: "*We thought the spruce didn't really fit in, so we took it out*" (farmer interview); the openness will be maintained by invited "*summer guests*" (an expression the farmer uses to refer to a neighbour's cattle) (an excerpt from this interview is included in Appendix VII, in Swedish). On these three farms, land has been opened-up by land cover conversion from forest to arable land.

On three other farms, arable land has been afforested: on the farm LUF 17, an arable field has been planted with spruce and birch. In 2010, the farmer described how "*everything here was under cultivation previously*" (farmer interview), by which he alludes to the time before the 1980s when his father managed the farm. Between 1980 and 1990, several fields had been afforested. On this farm, openness of land near the farmstead is important, while the lands are otherwise managed according to the end of improving all land cover types on the farm estate to enhance its landed value, including "*improv[ing] it for the leaseholder, to keep him happy*" (farmer interview). On the farm LUF 10, a field "*behind the old crofter's cottage*" (farmer interview) has been afforested by planting larch; this land is located at what from the farm perspective is a large distance (1.6 km) from the farmstead, in a forested area where there used to be a croft, and the farmer couple maintains the empty cottage. The farmer describes the afforested land as having been mostly open with a few broadleaf stands, going on in the same breath to explain the benefits of larch (the wood is darker than pine, and the tree is fast growing). This farmer couple retired from farming and leased out their arable land in 2000; the afforestation carried out "*14 years ago*" (farmer interview, referring to approximately 1996) was during the period when they were considering withdrawal. In the same area, two arable fields remain, which are maintained by cutting the grass once a year. On this farm, land management follows several aims, the farmer explains, including a good living environment, no pressure being placed on the children to take over the farm prematurely, and managing the property in a way that increases its value irrespective of who will take over in the future. On the farm LUF 7, a pasture on which trees had already started to re-grow has been actively afforested; after twenty years of off-farm employment, in 2010 the farmer shifted to farming on a less intensive basis (the particular reason why this parcel was not cleared from forest regrowth is not documented).

In addition to these land cover changes, two farmers reported having received approval from the county administrative board for afforestation of an arable field (1.4 ha) and a meadow (3.4 ha), respectively. Both fields are located separate and at a relatively large distance from the main body of the farms' arable land. The first case is a rectangular and level field (Figure 15), easy to till according to the farmer, but separated by surrounding forest. At the time of the interview, it had not been tilled for five years, since the farmer retired from farming in 2005. While the rest of the arable land has found an external 'manager', this parcel has been left aside. The second planned afforestation concerns "*a beautiful meadow*", as the farmer describes this piece of land lying somewhat more isolated from the rest of the arable land on this land; the farmer goes on to say that it does not feel right

to afforest this land. The rest of the arable land on this second home estate is leased out to a neighbouring farmer.

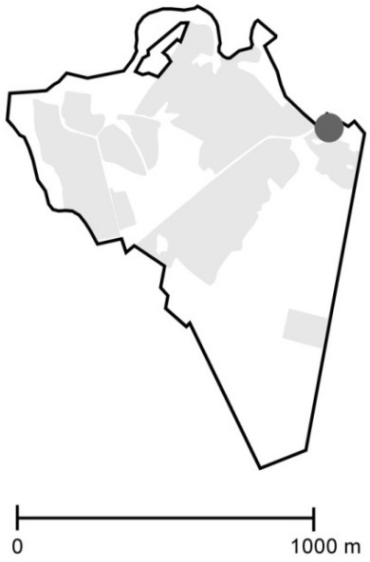


Figure 15. Planned Field Afforestation
The rectangular field at the eastern border of the farm estate is subjected to afforestation plans.

Arable land near the farmstead can be seen in these cases to be more stable than land farther away; and forest land in the same situation – i.e. near to the farmstead – should be described as more instable, especially when adjacent to arable land (the same goes for the localization of many of the clearings studied). At a distant location (from the perspective of the farm centre of the management unit), the openness of land is less stable. The stability of arable land and the instability of forest at the forest-arable land interface near the farmstead can be understood as time-economically motivated, as can the tendency to afforestation in relative periphery. The stability of arable land near the farmhouse can be understood as being reinforced by the objective of managing the landscape around the farmstead.

The What-Fits-Where -Principle

Landscape management points in the direction of the 'what-fits-where' principle. This principle can be seen to play a significant part, at the same time as it is difficult to describe its workings; this section provides examples of the principle in action. I would suggest that land cover decisions are relative to what is around, both in time and space. When spruce has followed spruce several times, when swampy land with aspen has been drained and replanted with spruce, when an old birch stand has been replaced by spruce, then a spruce stand can be replanted with larch, as "*we already had so much spruce*" (farmer interview). On another farm, after the mature spruce was felled on one parcel, it was replanted with spruce as that patch of land does not lie "*here in front of our eyes*" (farmer interview). Production value, and a desire "*to show responsibility to those who'll come after us*" (farmer interview) were brought up as motives for this action. At the same time, as already touched upon in the previous section, spruce and aspen have been removed to enlarge an existing pasture.

Where forest does not fit in, the farmer may remove such land cover to replace it with something that looks better when viewed from the farmhouse. On several of the farms studied, including the *clearance farms*, forest has been removed on grounds relating to the land itself, too, with the farmers saying that forest could not thrive on the land in question (e.g. on the farm LUF 5, as well as on the farms CF 7 and CF 11, see chapter B7). Another example of the what-fits-where principle upon is "*the hayfield nearest to the cowhouse [that] has not been ploughed for many years*" (farmer interview), an adjustment of the usual regularity of ploughing intervals to the convenience of having a grazing space nearby.

Land is also variously seen as something to hold on to or something to be sold. On one farm, a

separate part of the farm estate, with road access over a neighbour's land, was sold, one of the reasons given being that "*it made the neighbour so happy*" (farmer interview) to be able to purchase the land. To my mind, this is a further example of the 'what-fits-where' principle. Here the aim is not to introduce complete relativism in thinking about land-cover decision-making; rather, I wish to draw attention to what appears – without contradicting previously described findings – to be a central rule of judgement in farmers' land-use decision-making. It highlights the importance of considering the field as a timespace contained in the context of the farm as a whole, with history and spatial extension. Land-use decisions remain flexible and contextual, and they are taken in relation to what else is present on the farm or at the specific locality, including past land use decisions.

B.5 Background of the Land-Cover Continuity on Arable Fields

Field memo, 2011: They lack the go; they perceive better options in other occupations.

The land-cover process discussed in the previous chapters is here examined from the viewpoint of the motivational background of the reported land use activities. The function of the farm for the landholders interviewed is discussed; I thus describe how I perceive the farm projects on the *land use farms.*

The period 1990–2010 saw a reduction in land management on the *land use farms* in terms of time input in land use activities. On three farms only of the twenty-four, the engagement can be seen to have increased (in two of which cases the rise was due to retirement alt. a switch from non-farming employment to farm-based occupation); while on thirteen farms, the situation can be characterized as a decrease (see chapter B1; see also Table B Appendix I and Table 4). On eight farms the engagement in the land appears to hold an unaltered level, including those farms on which the management of the land was already leased out in 1990 (on one of these farms, the landholder has plans to engage more with the land himself). The income situation in 2010 on *land use farms* shows that six farmers who stopped keeping cattle during 1990–2010 have retired and that two farmers have switched to external sources of income (one of these two has continued farming on a minor scale, keeping sheep while at the same time leasing out part of the land). The farm situations motivate the haymaking and the less intensive keeping of cattle that provide for land cover stability on the *land use farms*. The decreased engagement with the land has, according to the farmers, had no more than minor effects on land cover (the reported changes were presented in chapter B4). Apparently, reforestation, or a switch to some other productive use of land, is halted because the arable land has not lost all of its value to the farmers; they are thereby motivated to seek solutions for continuing with land management despite low-level economic returns and/or capacity restrictions.

Time input into land management can be looked at from two sides: the time input of the farmer and the time input into the land. Concerning the former, on several farms the farmer's time input into land use activities decreased during the period, while it remained unchanged on the remainder, except for three

farms where there was an increase in farming activities, as mentioned above (see Table 4; Table B Appendix I). The decrease of the farmer's time input is, on most farms, a result of diminished capacity to engage in farming (due to old age and/or the need to pursue non-farming sources of income, which in a few cases was due to 'twists of fate'). This is reflected in the fact that more land is leased out today compared to 1990. This leasing-out is not an automatic mechanism, but demonstrates a solution by which the upholding of the status of the arable land is guaranteed. The farm management on several farms appears to have become less intensive by 2010; less is being done with a smaller time input in land management compared with 1990.

When looking at the matter from the second angle mentioned above, the time input into the land, it appears that land management has become less intensive from the perspective of a single field, too. Cutting the grass once a summer is something else than cutting it three times, with in-between manuring. If the cereals are not threshed, this, too, decreases the time inputs in the land. Single fields receive often less tilling (by the landholder or the leaseholder) in addition to the decreased engagement of the landholder. Various reasons are given for this reduction as discussed in the previous chapters: the fact that certain crops call for large-sized machinery and implements (at the same time as the farmers are faced with small fields, narrow gateways, and winding roads); long distances from the farmstead to leased-in fields; and the economic pointlessness of growing cereals. Summing it up, then, the background to such decreased engagement with the land is the poor or non-existent profitability in farming or in particular fields. Regarding the recent agricultural subsidization, i.e. the farm payment scheme, it is necessary to keep in mind that their role is only partially covered in this thesis (see the discussion on this topic in chapter C2, section Reflections on the Interpretations Presented).

What is Viable Farming?

At its root, profitability on a farm is based on healthy farm animals and reasonable weather, as one of the farmers put it during the 'study circle' session on the topic. The discussions showed that if this basic condition is met 'profitability' is taken to mean a range of things, when put in relation to the individual farms. For some farmers, profitable in relation to their farm meant economic viability producing a surplus that the family can live on and making it possible to develop the farm. For other farmers, profitable in relation to their farm meant zero surplus – a situation that enables maintenance in terms of farm buildings and livestock, "*it means you bring in enough money to keep the cattle and paint the cowhouse*"(study circle materials), while positive surplus was also brought into connection with "*quality of life*" (study circle materials). The meaning of profitability was further connected to "*survival*" (study circle materials), which was placed in a chain of conditions starting with profitability: "*calmness, thus an okay situation, thus survival*" (study circle materials); or to "*living rich, dying poor*" (study circle materials). The farmers judge it most important that the farm would at least break even; they themselves could survive on off-farm income – with the exemption of the three farmers running agricultural enterprises for a living (two large-scale and one minor scale enterprises). The various constraints discussed thus far appear to me limiting the prospect of returns from an engagement in agriculture on the *land use farms*; many farmers target less than the highest level of returns.

The Huge Change

The farmers refer to two major changes during the twenty period covered: firstly, the social shift which has led to lands being managed to a large degree by leaseholders, with few remaining 'active' farmers; and secondly, the damage caused by wild boars on arable land, which in fact also expresses a social situation. In my understanding, the former change is the "*huge change*" (farmer interview) that one farmer claimed had occurred during the period 1990–2010. In addition, the picture of the open land as being under threat is made up of various components; it is not only a matter of wild boars clashing with the proper openness of the land and constraining arable production, but rather, the whole lived-in landscape is under threat. The openness is perceived as fragile:

"It'll be lucky if the landscape is kept open. It'd be a pity if it all got covered with forest" (farmer interview).

One major aspect of the issue is the fact that younger farmers are rarely able to establish themselves and the mentioned decrease in viability (and thus in incentive). Interviewees seem to agree that soon (when all animal husbandry projects have ended) the lands will be afforested. The interviewees explain that it is impossible to take over a farm without receiving such as a gift; even in that case, it would be "*difficult as machinery and farm buildings are costly, too, one is obliged to have it large-scale and rational*" (farmer interview). They also, finally, assume that the increasing number of Danish second-home owners are likely to be keen on afforesting.

Farms have metamorphosed into places for living (see Table B, Appendix I). When discussing the notion of farm project during the 'study circle', farmers maintained that the single most important motivator for their choices is 'living on the farm'; the discussion showed that any livelihood project is closely entwined with the meaning of the farm as the place where one lives. If the decision-making had been effected solely in terms of productivity and economic returns, then on several of the *land use farms* far more arable land should have been converted to forestry production than is the case. Land management has turned into a tool for preserving the openness of the landscape around the farmhouse, and seemingly carries a memory of old times (when oneself, or one's father or grandfather, ran an agricultural enterprise). Land use could perhaps be characterized as 'decoupled from production' in the minds of the farmers, too. The conclusion I would suggest here is that the valued openness of the land, the specific land management regulations enacted with the accompanying subsidization of arable land enter a negotiation on the farms, and in effect protect the 'open landscape'.

The negotiation concerning protection of the openness of land is not without pain and insecurity when, having originally been committed to the farm as a place of both living and livelihood, one is obliged to seek external income because farming as a livelihood is not possible. Two farmers touch upon their childhood conviction of wanting to become a farmer; one of them describes:

"My business has been as a pig farmer, I thought I could live on that: the cattle I kept to keep the fields open" (farmer interview).

In a similar vein, a third farmer couple explain that they embarked on the farm project hoping to be able to make a living from agriculture.[51] Others decided, as soon as they took over their farm, on another path despite having adequate

[51] Farms LUF 15, LUF 20, LUF 22.

agricultural training.[52] The relationship to the farm is simply constrained existentially:

"Somehow you try for as long as possible to get going in one way or the other. I mean, you don't do it directly for the money; it's something else that makes you want to keep going. (…) during the last year [with pigs] I just felt that I've got to wind it up, [asking myself] is that what I have to do?!" (farmer interview).

The farmer cited has succeeded in establishing a new farm-based source of income. It thus appear likely that the farmers' commitment to their *farm projects* is their motive for carrying on, in a spirit of what can be described as adaptable persistence.

So Why Not Afforest?

I now turn to describing in more detail the factors, which hinder forest regrowth on the *land use farms*. A main factor here is the ability of the farm project to modify, to take on a new orientation so that new activities can be incorporated while remaining on the farm. This taking a new direction may work out more or less smoothly, the farmer interviews suggest. One farmer describes a shift in livelihood to non-farming income by saying: "*The pieces fell into place bit by bit*" (farmer interview), this indicating that the shift is fully integrated mentally. She and her husband acquired the farm for an animal husbandry project with pigs:

"We really put everything into the pigs in the beginning; we had 300 pens, so we were breeding 1000 pigs annually up until four years ago" (farmer interview).

It had been mainly the wife running the pig project, which she did half-time while she was also busy looking after the couple's children; her husband had a job off the farm. After twenty-five years with pigs, times changed and another strand in the farm project emerged, helping the pieces to fall into place, as she says; now, the farm is their home, and both work off-farm. One might suggest it being natural for a mother to seek her 'own' income, when children have grown up and moved out. However, this farm story clearly conveys an original farmer identity, based on rural roots and agricultural training. Their goal when purchasing the farm was to establish themselves on an own farm to continue their previous engagement in agriculture based on lands on lease. Now they continue to engage in the land through investing 'in the landscape', examples of which are the "*quality-of-life pond (…) – a great place to spend time at, [we go down there and] make a fire*" (farmer interview), and the enlargement of the pastures that can be seen from the farmhouse by clearing forest. It is interesting to reflect on the pieces falling into place; the expression indicates how fluid a farm project can be 'without breaking', i.e. without losing its orientation completely (a similar example is the farmer with guided field tours mentioned above). Other farmers on the *land use farms* describe the pressures of a non-viable situation in which they kept going until "*[they] were down on [their] knees*" (farmer interview). Altogether giving the impression that they view having an off-farm job as a compromise, a less satisfactory but necessary solution that makes it possible to continue with the farm project.[53]

Despite of external occupations or retirement, several farmers engage in farming and animal

[52] Farms LUF 12, LUF 17.

[53] Farms LUF 18, LUF 17, LUF 15, LUF 7.

husbandry on a part-time or hobby basis, apparently since this is part of the life and history of the farm. Farmers explicitly mentioned their appreciation of and interest in farming as a way of life, animal husbandry, or specific types of farm animals.[54] One farmer says that it is nice to have cattle strolling about on the fields, while another explains that he has maintained his engagement not only because of the long duration of the lease agreements he holds, but also because he likes farming and has never thought of quitting. Continuing farming means remaining aligned along the long line of engagement as a farmer, as I see it. Even though simpler choices exist, – "*it would be easier to plant spruce*" (farmer interview) – farmers carry on managing the arable land by finding various arrangements, which are a response to the fact that they themselves cannot invest time in the land. Withdrawing from farming therefore uncovers that the open land contains as it were complex values. Such complexity can also be present when the farm has been purchased 'later', making a second home. The retired couple on the farm LUF 24 presents the purchase of the farm as a capital investment in the landed property, referring to these as lasting values. The farm is however also valued as a peaceful living surrounding as a second home, and in particular they find it difficult to afforest a beautiful, yet outlying meadow. (The landholder reports that they spent more than 50% of their time during the last years on the farm despite of having access to two additional landed properties: a summer cottage and main property in a semi-urban setting).

[54] Farms LUF 8, LUF 15, LUF 22, LUF 21, LUF 19, LUF 15, LUF 5, LUF 6.

At the core of such statements, I would suggest, lies the fact that the majority of the *land use farms* are homes, often being passed down from generation to generation (see Table B, Appendix I). Two farms only are utilized as second homes, and one farm had no permanent residents in spring 2010. Remaining 'at home' is seen as the obvious thing to do even when all of one's land is managed by others. One farmer explained why she remained living on the farm by saying: "*Well, this is where I live, it's where I'm happy*" (farmer interview). To this interviewee the idea of moving away was unthinkable. Farms are homes, even for farmers running an agricultural enterprise:

"The farm is first and foremost our home, and after that comes the fact that for both of us, it's also a workplace" (farmer interview).

Farm ownership deriving from taking over from the parental generation is not a given. The farmers whose farms were previously 'in the family' have often taken over after buying out their parents or siblings. Various accounts on this theme, which I will not go into detail on, make it plain that things could have worked out differently. It is clear that the inheritance aspect is very important to the farmers; they mentioned it spontaneously, detailing for example who in the family was the first to till the land. The farm's identity as a family farm leads to its being maintained as a landed value, a previous investment that should be managed, nurtured and kept in the family. Often, though, the question of who will take over is open:

"Who will take over the farm is the big question, it's on your mind, you don't know how it's going to work out. I'm starting to get used to the idea that maybe I'll have to sell up" (farmer interview);

"We'd definitely get more than 10 million if we sold the farm, but we want it to be handed down

in the family, from one generation to the next" (farmer interview).

Not all farmers see a possibility that one of their own children will take over – "*they have other interests*" (farmer interview) – but several express the hope that "*somebody will take over*" (farmer interview), while the best had been if the farm could continue "*in the family*" (farmer interview).

The farm as a home comprises the farmstead, but also land; there is a landscape to the place where one lives. This landscape is not rigidly fixed along with the current shape of the farm estate or the farm domain. Land can be bought and sold, the land cover can be altered, gravel can be exploited (its extraction leading to changes in the shapes of the land), and land management can change hands – but nevertheless the total of landscape appears lasting and contains specific favourite spots that are valued. Farmers frequently related that "*it's beautiful here*" (I should have come in the summer, for example, to see particular places on the farms).[55] These places may be specific to their nature, such as meadows, a winding brook, or the banks along a ravine with a stream running through which a farmer describes as a 'deciduous milieu' in which he is happy, going down there with his dogs and a flask of coffee: "*I can't really describe how good it feels [to be down there]*" (farmer interview).

The valued places can also connect to the farm as a place that is open, where there is space, room to 'be', when judging the repeated statements concerning "*keeping the lands open*" (several farmer interviews). Especially close to the farmhouse, openness appears important – so that "*there's a view*" as one farmer put it, stands of spruce right outside the farmhouse are not welcome, "*forest makes it so dark*" (farmer interview). One landholder directly when taking over the farm arrived at the conclusion that there was no economic sense in becoming a farmer for a living: "*It's a lot of work for not very much money*" (farmer interview); despite of this, he and his wife have arranged during their thirty-two years for the arable land to be kept open. Another interviewee, who manages a farm estate in the middle of a forest as a second home (but where she was born and grew up), keeps driving to the farm to tend the grass although at times this is rather a nuisance: "*I want to keep the grass short*" (farmer interview), she says, disclosing that "*friends wonder why I drive up there so often if it's such a pain*" (farmer interview). The cropland and the pastures (two hectares of each) are taken care of by a person, who also keeps grazing animals there (by oral-only agreement). The forest is taken care of by a forestry contractor, while the garden is fenced in to keep wild boars off the lawns. She maintains several old flower varieties, she and her husband have invested in the buildings – the farmhouse, the stable, the barn and machinery shed – and great value is placed on being able to be there with the small grandchildren. It would definitely be simpler to plant forest, as another farmer put it, but here, too, the value attached to the place and its openness makes it worth the effort.

The specificity of the openness of the arable spaces would not be what it is without the forest. Forests on the *land use farms* represent complex interests. Sometimes the farmers express that they have no interest in forestry, despite of which they may attach value at the rural environment for its peacefulness and wildlife (an environment of which forests are an integral

[55] Farms LUF 9, LUF 5, LUF 6, LUF 18, LUF 20.

part). To the farmers, forests represent an economic asset and source of income[56], providing a buffer to make it possible to meet farm or farming expenses[57]; the farmers report visiting their forests on a daily basis for walks[58]. Forests provide firewood for heating the farmhouses[59], and farmers engage in forestry activities in their forests (or have done so during their farming career). Forests and open lands combine to make an appreciated rural living environment that provides peace and privacy, not least in contrast to the farmers' experiences of urban environments[60]: "*There is freedom in living on a farm*" (farmer interview). The latter kind of explicit statement is however only made by persons who have either purchased the farm in later life, or spent many years in non-farming employment[61]; I think such statements arise from reflections during absence or limited time 'at home' concerning the values of the rural environment. The farm environments also represent a safe and beneficial milieu for grandchildren.[62]

In this rural landscape, it is the (destiny of the) arable land that the farmers tend to bring up for discussion (the interviews covered all types of land cover and land use on the farms, see Appendix III). The openness of land is brought into connection with what may be taken as investment made by previous generations in spite of the fact that currently a considerable proportion of the arable lands do not constitute more than a marginal economic asset – thus representing an investment without active function, indeed a 'landed' value to paraphrase the usual expression of landed property for owned land. The fact that the arable land is perceived as being under risk of reforestation discussed above uncovers valuation; this was brought out very determinedly by two farmers who would not to let the open fields be 'closed down' during their lifetimes:

"During my time I could never accept seeing these fields being covered with forest. The rational thing would be to plant trees, but in my heart that just feels wrong" (farmer interview);

"The fields will be kept open!! You see neighbours who just go passive and let the land lie or plant forest, and in that way this agricultural landscape would disappear" (farmer interview).

It was frequently suggested by the interviewees that arable land should not revert to forest: "*You just don't close down the land by covering it with spruce*" (farmer interview). This appears also a social situation in which it can take courage to assert, as one farmer did during the 'study circle', when the farmers presented their land use to each other: "*I have planted forest and I would dare to plant more*" (farmer interview).

Here, it is useful to refer to the findings from the *clearance farms* by way of contrast: The perception of arable land not 'really being used properly' by 'passive' farmers – i.e. those who receive a subsidy while cutting their grass once a year – is frequently voiced by farmers I interviewed on *clearance farms*. This perception might primarily derive from their own wish for more land to be able to expand farm production: they see 'passive farmers' as blocking access to land for 'active' farming (this topic is in focus in chapter B7). However, one interviewee in

[56] Farms LUF 17, LUF 20.

[57] Farm LUF 15.

[58] Farms LUF 12, LUF 10, LUF 18.

[59] Farms LUF 12, LUF 10, LUF 13.

[60] Farms LUF 20, LUF 12, LUF 13, LUF 18, LUF 7.

[61] Farms LUF 12, LUF 15, LUF 1.

[62] Farms LUF 16, LUF 5.

particular had given this matter thought and came with well-articulated arguments:

"The land is the most important thing. In ten years, my husband will be sixty: shall we then remain sitting on the farm, with the land unavailable for anyone else to use?! People seem to think they can take their land with them to heaven, and have this attitude, like "Nobody else is having my land!" (…) There are people who own land in the village [where she grew up] and only visit their farms once a year for moose hunting, and nothing else. At the same time, us who are here now are merely the managers of land, we're taking care of it, and after us somebody else goes on to care for it – land should not be owned like a thing" (farmer interview).

This farmer describes a situation containing a conflict, although this conflict is not voiced or debated openly in the neighbourhood. It may be about the productivity of land in contrast to the non-productive value of private property.

At the background of arable land use – in-between different farms, as it were, there appears the norm that arable land should not be allowed to revert to forest; arable land appears contested and enmeshed with meanings in all its open emptiness. The values attached to the open arable land have both a pictorial and a material aspect. The landscape containing openness provided by arable land can be enjoyed, promoted by suitable land use decisions, and 'consumed' as a leisure time and living environment. Yet, the productivity of land is nevertheless dependent on sustained tilling. This then leads to the effect, I would suggest, that the maintaining of land becomes about maintaining or rather conserving production-related values. Evidently, land management is more than a consequence of the choice of a rural before an urban lifestyle; rather, what is at work is a form of orientation towards and commitment in relation to the land – an interpretation that I continue to discuss in Part C. Despite constant adjustments, small or large, such orientation that guides engagement with the farm lands on the *land use farms* has at large remained 'intact'. In order to summarize the farming practices and the background of the land-cover processes observed on the *land use farms*, which mainly comprise a land-cover continuity concerning the arable land, the various aspects are brought together in a situational map (Figure 16; a situational map charts aspects that are included in a situation at hand, cf. Clarke 2005). The *land use farms* appear located, in the sense of being situated, in what could be called a specific landscape practice, in which animal husbandry is perceived of as the way to make a living. In this 'region', farming practice entails keeping cattle, the farmers maintained. The generation of the individual landscape practices is social, too. Irrespective of whether or not animal husbandry is part of the livelihood project on the farm, it is regarded as the only viable path in this region (double arrow: Animal husbandy – Making a living). The farm projects reiterate this perception of 'the right fit'. Due to a mesh of 'tradition' and perceptions of external pressure (crops other than hay, or the keeping of pigs, would appear out of place here), cattle and hay are the agents evoked as having the effect of 'maintaining the open land' (two arrows). The farmers give explicit expression to the connection between arable cropping and the openness of their lands – and their statements can be interpreted as demonstrating a keen awareness of the interrelationship between land management and the open landscape valued so broadly across society (double arrow). Their farm ownership puts them in this situation of responsibility for the land and induces them to seek ways to maintain its status (two arrows). The concretely enacted farming practice (as carried out by the few 'active' farmers) relies on

leasehold for the major part of the land managed, which at the same time appears to be the solution for the landholders who cannot actively engage in land management on their farm (a kind of symbiosis, two arrows). The various lease agreements make the continuing openness of the lands possible. Income for those engaged in farming also comes from the subsidies under the single farm payment scheme.

The land-cover continuity in the case of arable land indicates that it has been possible to fit the transforming goals of activities within the farm setting and the farm project. It might be less important whether this should be viewed as flexibility in the farm projects, as I have described it, or as a readiness to change the farm projects, which might be another way of stating the same thing. What matters in the farm cases studied is that the landholder retains her/his ability to hold the farm, without, what appears important, the identities involved being disrupted too much.

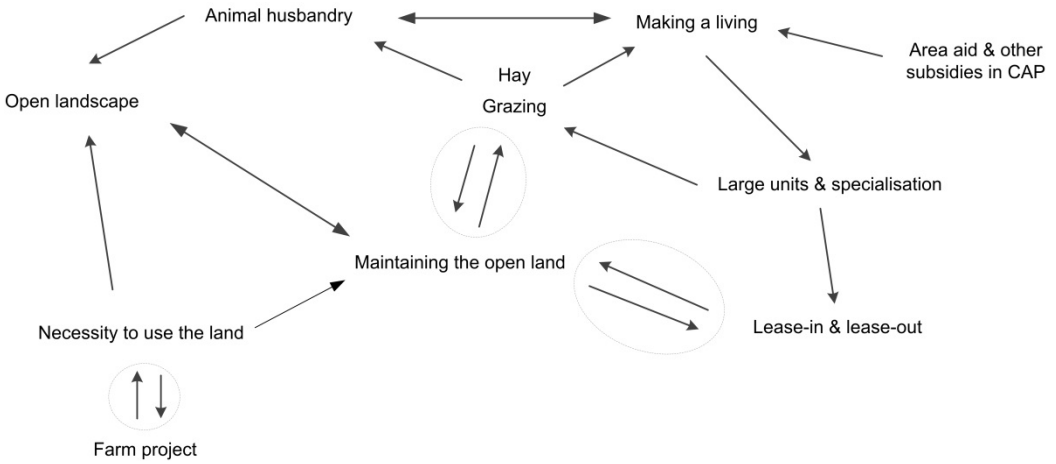


Figure 16. Situational Map: Summarizing the Findings, *land use farms*

B.6 Forest Clearance

In this chapter, focus is on the creation and placement of arable fields on contemporary farms; I discuss cases of forest clearance, which I call clearings when talking about a single field that is or has been created. I also describe the actual practice of clearing in detail in order to demonstrate the transformation of forest to a new condition of the land – the arable state – a state that takes effort to produce and maintain, and as such represents an accomplishment. It appears reasonable to suggest that even outside the cases studied here the general frame in which forest clearance occurs is a farm with access to both forest and arable land. On the farms studied, both types of land exist; the farmer engages in agriculture and forestry and both types of land are valuable to the farm. Forest clearance makes sense on a farm engaging in agriculture; otherwise, clearance appears a meaningless effort. When the specific arrangements and practices associated with arable land use are already present on the farm, forest clearance not only produces 'new' land, but also creates space for farming, targeting either an expansion or spatial relocation of current land use activities. In any case, the clearing widens the openness of the landscape in its surroundings; this effect and potential of clearance activities to influence the distribution of forest and arable land is discussed in the last chapter in Part C.

On the *clearance farms*, the cleared land is owned by the farmers and the arable land is produced for their own use, and a similar situation applies amongst the additional farmer contacts. The exemptions are the farmer on the farm CF 7 who has rather recently sold cropland including a clearing he himself cleared, though several years ago (3 ha of the total of 5 ha); and the farmers on the farms CF 2 and CF 5 have purchased forest land with the express purpose of converting it to cropland. The farmer on the farm CF 8 was faced with a clearance project included in a land purchase of forest and arable land: parts of the land were notified for clearance (and the trees had been felled) by the previous owner, yet there was no obligation for the new owner to fulfil the plan. Additionally, farmers also, when purchasing small farms, may have converted all or part of the forest to cropland[63], or used forest land in land exchanges in order to gain more arable land[64]. (see chapter B7).

The character of the original forest stand varies in the cases studied. These include an old spruce stand[65], old mixed forest[66], a mixed-aged pine stand[67], a mixed-aged spruce stand[68], mixed non-productive forest[69], a young spruce stand[70], and young birch thicket with old stumps[71]. Several farmers judge the land chosen for clearance as non-suitable for forest, because of the soil as such, or owing to swampy conditions. Arable land is more valuable from the perspective of a farmer, especially when the forest is seen as low in value or non-productive. The clearing on the farm CF 5 locates where there used to be a

[63] Farms CF 4, CF 6, CF 11.

[64] Farm CF 10.

[65] Farms Cf 2, CF 6, CF 9.

[66] Farms CF 5, CF 7.

[67] Farm CF 4.

[68] Farms CF 6, CF 9.

[69] Farm CF 10.

[70] Farm CF 11.

[71] Farm CF 8.

shallow lake, which was drained and afforested during forest plantation campaigns in the 1930s. This history was still observable in the forest the farmer maintains:

"It was swampy in the forest, so we couldn't drive there, and since you're not allowed to drain forest land, we couldn't manage it properly" (farmer interview).

On the farm CF 10, the cleared land was swampy, too, with low forest growing, mostly birch. On the farms CF 7 and CF 11, the cleared forests consisted of "*spruce [that] didn't do well*" (farmer interviews). The farmer on the farm CF 7 explains:

"The forest here never turns out much good; spruce doesn't do well, and anyway forest tends not to like crop-growing land" (farmer interview);

and the farmer on the farm CF 11 says:

"There's no sense in having forest in the open countryside round here. The trees were felled by the wind all the time, it was impossible to get a decent forest going" (farmer interview).

On the farm CF 8, the land under conversion to arable use was previously classed as non-productive – its remaking would bring a permanent improvement to the land, the farmer maintained. On the farm CF 9, the issue is the clayey soil:

"Here the soil is clayey, which isn't good for forest: the forest was never going to make any money" (farmer interview).

The farmer on the farm CF 6 explained that the clearings were on patches where there were small forest stands in the midst of an agricultural landscape; similar is the case on the farm CF 11, too. The view of the farmer on the farm CF 6 was that forest should be where there is forest, and land where there is land (which might sound cryptic, but is obviously based on a perception of the forest as not thriving or being out of place).

I cannot discern a 'typical' soil that would stands out as preferred for clearings – farmers choose what is the most appropriate land in the farm context for arable use, with as good a soil as possible.[72] The soils vary between clayey[73], silty[74], and sandy soils[75], and there are clearings on unsorted tills[76] and organic soils[77].

Land may thus be not suitable for growing trees, in the perception of farmers, but well suited for cropping. The statement that forest land should be where there is forest and open land where there is open land, was also encountered on one of the *land use farms*. I interpret such statements made in two different temporal contexts (the present, and the 1970s and 1980s) as expressing a resource management perspective, but as also connecting to (internalized) national policy goals of enhancing productivity in forestry and agriculture (see Rural Boreal Sweden). Such thinking is exemplified by a farmer quote where the farmer was discussing a far more 'stony' clearance experience than expected against the backdrop of the difficulty of obtaining permission for drainage improvements in forests in this part of the country:

"It would have been best to register the patch for conversion to arable use, get proper drainage done, and then let the forest grow back. In that way I'd at least have ended up with decent forest" (farmer interview).

It should be noted that forest lands converted to arable use are not always 'poor' for forest to

[72] Farms CF 2, CF 1, CF 8, CF 10.

[73] Farms CF 7, CF 5, CF 9, CF 4.

[74] Farm CF 2.

[75] Farm CF 11.

[76] Farm CF 1.

[77] Farms CF 10, CF 8; data missing for farms CF 3, CF 6.

thrive: solidly productive forest land, too, has been converted to arable use.[78] Finally, some farmers mentioned that clear-felled ground is of no value, which is obviously true from the perspective of agriculture generating annual income. In addition, as one farmer said: "*Who wants to live by a clear-cut the rest of his life?!*" (farmer interview, modified); it is better to make proper use of the land. Summarising the above, we can see that before embarking on a forest clearance project, farmers estimate the properties of the soil and consider the functionality of the forested parcel as forest.

On the *clearance farms*, the farm domains are not left without forest land after the conversions to arable use (at least thus far and in retrospect). The remaining forest is, in some cases, located on another owned property or on a spatially separate part of the same property. For example, the remaining forest on the farm CF 11 is located at a distance of 2 km in what is a generally forested landscape that contrasts with the mainly open plain where the cleared land is situated. On most clearance farms, substantial forest ownership is maintained after the clearing(s) (see Table A, Appendix I).

Land ownership has broader significance as a motive in clearance projects than just as provider of easy access to land. A clearing placed on owned land produces owned arable land, which comes with additional benefits; owned land is free from the insecurities associated with leasing (such as the risk of termination, as the farmer on the farm CF 10 mentions, or recurring rent increases, as experienced by the farmer on the farm CF 7). Producing one's own cropland will neither increase one's borrowing burden, nor require one to pay annual lease charges – as exemplified in the following quote, where one farmer explicitly states that his clearance projects have been carried out with the goal of "*having [my] own arable land and being free of having to pay leasing yearly*" (farmer interview).

Farmers generally report that clearing is cheaper than buying land, even when giving a financial expression to their own working hours, which I return to below. In most cases, the farmers install subsurface drains, meaning that the resultant arable field has functioning drainage, which is not necessarily the case with a leased field. A number of farmers also pointed out that an increase in land classed as arable on the farm estate also increases the landed capital value. In sum, clearing owned land for arable use means that farmers obtain land in good condition – enabling them to meet their production needs, and to expand the capital value of the property, which obviously provides more room for manoeuvre.

Clearance can thus appear a beneficial project to engage in when in need of more land[79], but the expansion motive is directly linked to the motive of obtaining arable land near the farmstead[80]. Also on the farm CF 2, forest clearance is framed not as a choice amongst others, but as the only way of access to more land, due to poor soil suitability and the neighbourhood situation. On this, more land is sought in the aim of achieving self-sufficiency in fodder production.

On the farm CF 11, several motives are put forward when explaining the background to the clearing: a desire for more land, not least for fodder production (with self-sufficiency now achieved); the opportunity to follow a better

[78] Farms CF 1, CF 2, CF 4.

[79] Farms CF 2, CF 8, CF 9, CF 11.

[80] Farm CF 1.

crop rotation; the ability to grow cereals for sale; a desire to increase the number of pigs. With all these objectives, it is perhaps best to say that the clearing was part of the solution: the farm has also been substantially enlarged by the purchase of a nearby neighbouring farm comprising nearly 100ha of arable land. Today, the farm domain consists of 230 ha of cropland (20 ha of which are held on lease), of which the 100 ha from the farm purchase obviously constitute a substantial part (although it is not clear whether other lease agreements were relaxed in conjunction with the farm purchase). The cleared patch was previously an isolated island of forest (four hectares, see Farm Land Map Farm CF 11, Appendix V), but when the forest was felled, there was no time to engage in further clearance activities at that time: "*It used to be an awkward job to get the stumps out*" (farmer interview). The land was therefore replanted with spruce, which in the end did not thrive. Meanwhile a crusher appeared in the neighbourhood, bought by a neighbouring farmer who offered crushing on a contract basis, and the original idea of converting the patch to arable use was put into practice. Interestingly, this clearance project was embarked upon only when a crusher 'appeared' on a neighbouring farm with that farmer taking on clearance work on contract.

Another basic motive mentioned as a reason for clearance projects has been the chance to optimize parts of a large-scale agricultural production[81] or the time input in farming[82]. In such cases, the clearings appear to be directly motivated by spatial factors. For the farmers on the farms CF 7, CF 5 and CF 10 control of the economy related to land or security of ownership are basic motives. In addition, the economy related to the clearance project is important, too. Economic reasons definitely play a part as drivers of the clearing of forest for agriculture in the current situation of high land prices in relation to the costs of carrying out clearance and thus creating land by oneself. The purpose has not been to evaluate the expenditure on the clearance projects objectively, as an inquiry of that kind into the farm economies did not appear particularly relevant for the concerns of the study; instead, I limit myself to mentioning the farmers' estimations. Farmers report that clearance costs are well below the price of arable land in the respective region, especially as regards land with newly installed drainage. The following exchange (excerpt from a farmer interview by a local newspaper team) illustrates both the general motive of obtaining land of one's own cheaper than by purchase, and the specific locational motives at play:

"REPORTER: But besides lots of work it must also cost quite a lot?
FARMER: Yes, that's right.
REPORTER: But you think the stones will weigh it up, then?
FARMER: No, I don't think they will, but you can look at it in different ways. I mean, if you bought this land on the open market, land with new drainage, it would have a price, it'd cost 100,000 to 150,000 [crowns] per hectare. So that means we've got it for half of that, at the most – new arable land!
PHOTOGRAPHER: I see if you put it that way I can understand what drives you, why you did it. You're saying it's the price of arable land that makes it worth the effort?
FARMER: Yes, that's it.
FARMER (SON): And you also get land where you want it, you don't need to buy something that's five kilometres away."

[81] Farms CF 6, CF 4, CF 3.

[82] Farm CF 7.

This discussion conveys that, although a clearance project is not for free, 'land made by yourself' is cheaper to produce than already-prepared arable land – a rule that appears familiar from other areas of life. Additionally, by clearing land that he already owns the farmer can steer the placement of new arable land to a certain degree, which I discuss in a section further below (see Where to Place New Land?). The cost of clearance depends on how farmers view their own work input in monetary terms. The farmers seem satisfied with the level of expenditure on their clearance projects despite running into unexpected complications (see next sections). Naturally, exceptions exist. The farmer on the farm CF 1 asserts that he has not counted costs. The farmer on the farm CF 9, in response to my question, remarks that he does not dare to calculate the cost because additional expenses stemming from improvement of lanes, installation of extra drainage (Figs. 17, 19) and extra stone removal have caused the total to "*get out of hand*" (farmer interview). Often, the cost of the clearance projects appears to be measured in relative terms, with the farmers balancing cropland prices in their regions against the expenditure of the clearing activities and the preparation of the land (costs for fuel, contracted work and machinery, drainage installation). The 'energy' put into a clearing is often considerable, as detailed later in this chapter, which indicates that clearance projects are also driven by their being an (exciting) part of being a farmer:

"As I like being a farmer, I need land to farm [so I have to clear land]" (farmer interview);
"It's also a challenge, to turn forest into arable land. And since it [the clearance project] has been pretty demanding work, it'll be great to see crops growing here in time, to see that one has made something lasting, created something" (farmer interview).

Farmers appear to enjoy the clearing work and the clearings. Among the additional farmer

Figure 17. Clearing with New Lane (right), Farm CF 9
Note: All photographs depicting farm land and implements in the thesis have been taken with permission from the respective landholder.

Figure 18. Clearing on the Farm CF 9

Figure 19. New Ditch on the Clearing, Farm CF 9

contacts, one farmer running a farm with 50 dairy cows and 164 ha of cropland said that since the 1980s he had regularly cleared land, approximately 12 ha in total. The farm domain includes land on lease (25 ha), located "*scattered over several villages*" (farmer contact). At present, he is busy creating a pasture, and gives as his primary motives "*interest, and the pleasure I get from working with this [the clearing work]*" (farmer contact), even though the clearings have also meant a great deal of work. "*It's exciting*", he explains, "*it's fun to create something*" (farmer contact).[83] Based on farmer statements and field observations, I would suggest that the farmers tend to view clearing and farming as related activities. This dimension is important to bear in mind when discussing the costs of clearance projects. Regardless of the size of the monetary cost, the effort input clearly exceeds what is usual in arable land use, as far as I can deem, even where the clearance work is carried out by machine power instead of human power. It takes persistence to remove stones and stumps, by whatever method.

Several farmers related examples of clearance in their current neighbourhood[84] or from their past, recounting clearance memories from their childhood[85] or describing clearings they themselves carried out earlier in their career[86]. Especially for farmers on Gotland clearing can be seen 'everywhere', as is underlined by farmers' accounts of clearance being a topic discussed with colleagues, reports from passers-by, and my own observations. In these cases, the current clearance projects represent nothing out of the ordinary: for example, the farmer on the farm CF 6 tells me that his father cleared a lot of land; he remembers how, as a child, he "*would always have to go and clear sticks and branches from fields when [he] had a moment free*" (farmer interview). Today he does not need to bother with the forestry residues, as he has access to machines that do the job: "*It's nice that I don't have to go and pick up the twigs and branches by hand*" (farmer interview). The children on the farm CF 7 have encountered a similar situation recently, as everyone in the family has helped to clear bits of tree root from the cleared field. Sometimes, the idea of clearing a patch of forest has been considered for a while with the circumstances hindering its realization. One farmer relates that his mother opposed clearing, and another farmer could not find suitable land – this farmer also told that, when he was young, one farmer had "*cleared the whole village*" (farmer interview), the clearing work being his engagement outside the growing season.

Such observations of previous examples of clearance projects remind farmers of the fact that clearance is an option, I would suggest, when in need of more arable land. In addition, they contain information on how to approach the task of clearance. Other channels of information, too, may prove useful: the farmer on the farm CF 5, having seen a documentary feature on forest clearance for arable use including a crusher demonstration, contacted this person to learn more about the implement and the technique.

The transformation of forest into open land is a generic practice that has produced arable land in boreal landscapes throughout history, and farmers appear not to have forgotten this

[83] One farmer, who had recently handed over the farm to his son, showed ground he had cleared besides the vast openness of the large clearing (20 ha) and told about his plan to build a house for himself just next to the clearing. In summer 2013, he told me, sending a picture of crops ripening in the new field together with his message that his new home was now ready and he had moved in.

[84] Farms CF 8, CF 4, CF 10, CF 7, CF 1.

[85] Farms CF 6, CF 7, CF 3, CF 2.

[86] Farms CF 4, CF 5.

background – as in the words of the large-scale dairy farmer on the farm CF 3, for example, replying to a question of mine hinting at additional clearings on the farm:

INTERVIEWER: "So you have several clearings on the farm…?!
FARMER (LAUGHING): "All of it is one big clearing!" (farmer interview).

That said, although they have a fund of knowledge of clearance projects, the farmers to whom I showed my results concerning recent forest clearance for arable use (cf. Solbär, 2011) were surprised at the nationwide distribution of clearance cases.

In addition, I asked the farmers running large agricultural enterprises about what there is to gain by a small addition to what is already a large acreage (for the total size of the *clearance farm* domains and the clearings, see Table A, Appendix I). Their answers make it plain that, for an 'established' farmer, clearance represents progress in the optimization of land management. The farmer on the farm CF 6, for example, with a total managed cropland area of 378 ha and three clearings – one of 1 ha and two of 3 ha – explains that he runs is an established enterprise with most of the managed land compactly located, with the exception of one lease of 55 ha that is situated some 5 km away, and that he is satisfied with the acreage currently managed. In this 'established' situation, the clearings make for more efficient farming, since driving back and forth over the fields has been reduced, and shade that affected crop growth has been removed (I return to discuss the clearings this farm in the section Where to Place New Land?). The farmer on the farm CF 2 (managing a total of 238 ha) cites the larger unbroken area in answer to my question of why he made the effort of clearing, given that the addition in hectares is fairly small (2+12 ha). For these two farmers, forest clearance represents an opportunity to increase the productivity of existing fields, contributing to optimizing the production on the existing acreage. Moreover, the farmer couple on the farm CF 3 with 250 ha of arable land, maintain that the 8 ha they have cleared has a psychological significance, since this is a parcel that had been cleared twice already, by the farmer's father and grandfather respectively:

"INTERVIEWER: This small clearing, though, can't be of such a great significance…?
FARMER (HUSBAND): No, no…
FARMER (WIFE): But psychologically, it's important. We decided that now was the time to do it, we're the third generation to set about clearing this small patch" (farmer interview).

As with any other everyday project, a clearance project may be dropped if the 'situation' changes. The farmer on the farm CF 9 now thinks of one cleared parcel as peripheral and considers letting the forest grow back. The farmer on the farm CF 1 did not fulfil his plans to clear more land around the first clearing because arable land became available due to retirements in the neighbourhood: "*Nowadays nobody keeps cattle, so now I kind of manage the whole village*" (farmer interview).

Land ownership, economy and basic needs arising on the farms can be seen to be important factors triggering the commencement of a clearance project. The decision to place a clearing on owned land nevertheless does not fully account for the specific placing of 'new land'. Seeking to create rational tilling spaces by re-shaping and re-sizing the fields appears an on-going endeavour, in which the clearings provide separate, step-by-step solutions. Sometimes, there are particular geographical reasons: one farmer explains, for example, that he could not engage in clearing as there was no suitable land

(i.e. sufficiently level and free from stones) on his own property. Or, clearing may create additional benefits such as to enable access to existing fields from other directions, on the farm CF 2 a new track can be laid to avoid driving over a steep slope and straight over a field:

"FARMER (DAUGHTER): And now we don't have to take that terrible track there.
FARMER: Yes, just the fact that we could make a lane down here, over to there, means that we can avoid that steep slope. It's good that we can drive round it now.
FARMER (DAUGHTER): And on top of that, we no longer have to drive straight across the field.

Figure 20. Piled Stumps at the Clearing, Farm CF 2

Figure 21. Piled Stumps at the Clearing, Farm CF 3

INTERVIEWER: A neat solution all round, then!" (farmer interview).

Moreover, as detailed above, sometimes there is a history to the particular lot cleared that can trigger a new (or indeed continued!) clearance project. In sum, very often, a locational detail is cited as the main reason for the placement of a clearing. Before discussing the placement of the new land obtained by clearance, I describe the practical clearing activities on the *clearance farms*.

On the Praxis of Clearing

The 'production' of arable land represents a material transformation, as I show in this section. I argue, further, that the practical effort invested in the creation of arable land provides the basis for the valuation of open land as an accomplishment. Clearing is an intensive encounter with what is left of the forest land once the timber has been removed. The objective of this close contact is to sort out and remove 'things' that do not belong to arable land use. The forest is literally taken apart; the things removed are put on diverging trajectories, and what is kept in place is the 'land', i.e. a fine-grained soil.

Once the trees have been felled on a piece of land that is to be made into an arable field, there are two ways of dealing with the residues: the first, digging up the stumps. The stumps are lifted out of the ground with an excavator[87] – innovative farmer contractors have constructed devices for grasping the stump firmly[88], cutting it to lift it up in two parts. The stumps are stacked to dry for up to four years (Figs. 20, 21)[89], before

[87] Farms CF 4, CF 7, CF 10, CF 1.

[88] Farms CF 6, CF 9, CF 3.

[89] Farm CF 2.

being chipped and sold as wood-chips, often in conjunction with stump harvest by a forestry pilot project (Figs. 22, 23). In this phase, unexpected extra tasks, and therefore cost items, may appear, as for example on the farm CF 4:

"The stumps would have generated 100,000 [crowns], if we hadn't been forced to move them to make them more accessible [due to wet] for the mobile [stone] crusher. By the time, everything was paid for the margin was only 35,000" (farmer interview).

The second way of dealing with stumps is to grind them into the soil together with everything else, including smaller stones, with a crushing implement to be connected to a tractor for driving over the land (Figs. 24-26).[90] The crushing option in most cases requires hiring a contractor and this makes it a costly option as working over the land with such a crusher goes slowly. Crushing generates however an arable soil much faster than is possible if one utilizes the alternative way of digging up and removing stumps and other residues on the logged field. When crushing is carried out on a field where thicket has started to grow back or where a mature spruce has been logged, the transformation is astounding (Lundberg 2005:10). The farmer in a documentary feature describes his impression: "*The crusher is amazing, it takes you from newly-logged lot to seedbed in no time*" (farmer in Tedestedt 2010).

The farmer on the farm CF 8, who hired a contractor to crush a patch of birch brushwood, which surprisingly contained old stumps as well, declares herself happy with the result although it took double the time planned:

"*The ground was great after the crusher had been over it, there were just a few little bits of branch and root left in the soil – so now we can get straight in and harrow it, and then sow*" (farmer interview).

Figure 22. Sorted-Out Stump Chips and Soil, Farm CF 4

Figure 23. Piles of Crushed Materials from the Clearing in Front, Farm CF 10

[90] Farms CF 11, CF 2 (one of two cleared parcels). In the rest of the text when I refer to a crusher, this type of device is meant.

Figure 24. Crushing Implement, Farm CF 5

Figure 25. Side View on the Crushing Implement

Figure 26. Crusher Roll with Teeth

The tilling movement in this case of clearing entails slower movement than fetching hay bales or working through a stubble field, 15 km/h, as the farmer on the farm CF 4 specified (see the chapter Tilling Work).

The reported crushing times vary depending on the contents of the land that is being crushed. Crushing spruce stumps on a previously forested patch of land (where several stumps have a diameter of 60 cm) with a crusher with a working breadth of 2.5 m took 10 hours/hectare (h/ha) on the farm CF 2. Crushing on land cleared from stumps appears to take less time, 5-6 h/ha, according to the experiences from the farm CF 5. Converting the birch brush mentioned above, including old stumps, to arable soil on the farm CF 8 consumed 4 h/1.5 ha, while patches without stumps consumed 2 h/ha. One farmer sees the time expenditure of crushing compared to the other options as justifiable:

"Well, I guess it [crushing directly after timber removal] was rather costly but on the other hand we did sow our first crop on the land in spring 2007, meaning that it was actually only 14 months after the forest felling that we were able to sow (laughter)" (farmer interview).

Such rapid transformation of forest land into a farming space is clearance at its most spectacular.

Crushing stumps is only an option if the patch is free from stones, or only contains small stones: There is no way around larger stones in a field! By this, I mean that there is no evading the one-by-one encounters to remove the stones (Figs. 27-29). This part of the clearing work is about finding as many stones as possible, as they are the main hindrance to tilling, breaking implements, and extracting them without lifting up all of the soil at the same time.

In a similar context, Setten (2002:53ff) mentions the interaction of technological development with stones and boulders in arable fields as a test of creativity that has triggered innovation in the development of agricultural implements. Farmers told me about innovative contractors specializing in land clearance who have

customised solutions such as an excavator bucket with long teeth and a grid at the back. One of the farmers specializing in clearance on a contract basis (EXP 3) described this bucket as broad (90 cm) and with 50–60 cm teeth at the front, which rake through the soil, picking up stones and loosening the earth; at the back of the bucket, the grid then allows the soil to be shaken onto the ground. Using such a bucket saves one round of crushing, according to one farmer who utilizes these services (farm CF 6).

Sometimes stones are discovered unexpectedly under the surface. The clearing on CF 1, for example, contained far more stones than the farmer had estimated having seen a ditch that had been dug nearby for a telecom cable; he originally hired a forestry tractor to transport the stones off the field, but now they have purchased a stone picker for the farm, "*because it's stony everywhere*" (farmer interview). The farmer on the farm CF 5 reports that the land contained many stones, far more than he had imagined at the outset: they had transported away between ten and fifteen thousand tons of stones (Figs. 27, 28). There were so many smaller stones that they could not use the crusher they had purchased (Fig. 24). Stones are generally obstructive:

"Well, when [my husband] started clearing a patch with a borrowed shredder, and ran it into a stone, that was, let's say, an exciting incident – and you understood that any previous attempts [to clear the land] had probably found there were too many stones" (farmer interview);

"I'd have to say that there have been troublesome moments, yes. What's most frustrating is when you can't get going properly: for one thing, this weather puts the brakes on. And then, if there aren't any stones, it's not a big job at all, there's machinery you can use – but stones are a real problem, dealing with them is a lot of work and takes a lot of time" (farmer interview).

Figure 27. Removal of Stones, Clearing on the Farm CF 5

Figure 28. Stones Removed from the Clearing, Farm CF 5

Figure 29. Clearing (20 ha), Farm CF 5

Figure 30. Clearing, Farm CF 9

Figure 31. Clearing, Farm CF 10

Figure 32. Clearing, Farm CF 7

When there are stones, the clearance project takes much longer – possibly, as on the farm CF 5, a couple of years more than what might have been expected when planning the clearing activities:

"FARMER: Well, if the ground hadn't been full of stones, we'd have removed the stumps, levelled the land and then taken a crusher over it, as was our original plan.
INTERVIEWER: And that would have taken one winter and one summer?
FARMER: Yes" (farmer interview).

Additionally to the time expenditure, the costs rise and endurance is called for when stones get in the way. For all the technological power farmers can call on, reality carries surprises and difficulties to be solved.

Other farmers have much more convenient circumstances: the farmer on the farm CF 2 relates that the cleared land will be easy to till, since there were no stones in the ground; similarly, the farmer on the farm CF 7 has a clearing with clayey soil and very few stones. The farmer on the farm CF 9 explained that when sowing was carried out, the clearing had "*lots of sticks but not stones*" (farmer interview) (Fig. 30), similar to one part of a clearing on the farm CF 10, where crushing was not carried out (Fig. 31). In other words, it is possible to advance to till newly cleared soil without crushing remaining roots, branches etc. provided there are only minor stones or no stones at all, which was the case on the farm CF 9. The next steps are then about getting rid of the remainder of smaller stones, sticks and bits of root – which is the family's evening 'pastime' on the farms CF 4, and CF 7 (Fig. 32).

Additional rounds of crushing can be carried out, too, alternating with working through the soil with the long-toothed bucket. The farmer on the farm CF 2 plans to level the soil on the

second clearing with a crawler tractor before further soil preparation, which he hopes will make the second crushing smoother and faster. Farmers who do not apply crushing utilize other, more usual agricultural implements to further work through the soil (Figs. 33, 34). Finally, subsurface drainage is an option[91], liming and/or manuring may be needed before crops can thrive[92], and work might be required to enable access to the field for a tractor with implements, depending on the quality of the existing tracks[93]. Then the time is ripe for the farmer to sow and let the crop grow.

Figure 33a, b. Harrow Purchased for the Clearance Project, Farm CF 4

Figure 34a, b. Disc Harrow, Farm CF 9
Note the bits of wood stuck after working on the clearing

After a few years, the sticks in and on the ground will have decomposed, and at this stage, it is only possible to tell that the field has been cleared fairly recently by digging into the soil for pieces of wood. When one visits sites where the clearance process has been completed, nothing that meets the eye reveals that there was forest here not all that long ago; the open land resulting from the clearing merges with the rest of the open countryside (see Fig. 60). This is especially true in landscapes already predominantly characterised by open countryside, where, prior to being cleared, the forest stand likened an isolated island surrounded by cropland such as on the farms CF 11 and CF 6. The newly created arable land can be perceived as temporally and partially stabilized, substantially changed in its composition compared to forest land, and dependent on continued activities: the new arable state calls for on-going maintenance in

[91] Farms CF 6, CF 9.

[92] CF 1, CF 11.

[93] CF 9.

order to be sustained, otherwise the forest will grow back. After preparing the land for arable use, the farmer therefore goes on to manage the fertility of the soil and the diversity of species 'allowed'; the clearing of fields as a 'purification' of land is continued by the endeavour to manage the 'weeds': "*No farmer wants weeds (…). The idea behind plant production is to support one or a few species or varieties, (…).*" (Ahnström 2009:58). Thus the doing involved in clearing 'new land', i.e. making arable forest land, includes the removal of stumps, sticks and stones from the soil; it entails a hands-on sifting, shifting and sorting out of things that are in the wrong place from the perspective of arable use and putting them onto diverging trajectories. Essentially, the soil that is left can be characterized as (an) abundance due to its fine-grained constitution, as part of the *process landscape* (see Part A for the theoretical discussion of this). Making land arable is about material transformation to produce this 'fine-grained' consistency (that allows for ploughing). The steps needed consist of parting, removing, and moulding (terminology in Hägerstrand 2009, my translation), although moulding constitutes only a minor part of the process. I have produced a generalized notational scheme for visualising the characteristic process of transforming forest into arable land (Fig. 35). The status of the clearing on its way is documented in two photos (Fig. 36).

On several of the farms studied, finally, branches, tree tops and stumps were 'remade' into wood-chips (see also Figs. 22, 23), and in that way turned into raw materials for the expanding bio-energy sector to be used to produce heat and electricity (cf. Westholm & Beland Lindahl 2012; Berndes *et al* 2003). Several farmers on the clearance farms have benefited from bio-energy projects offering stump harvesting without charge.[94]

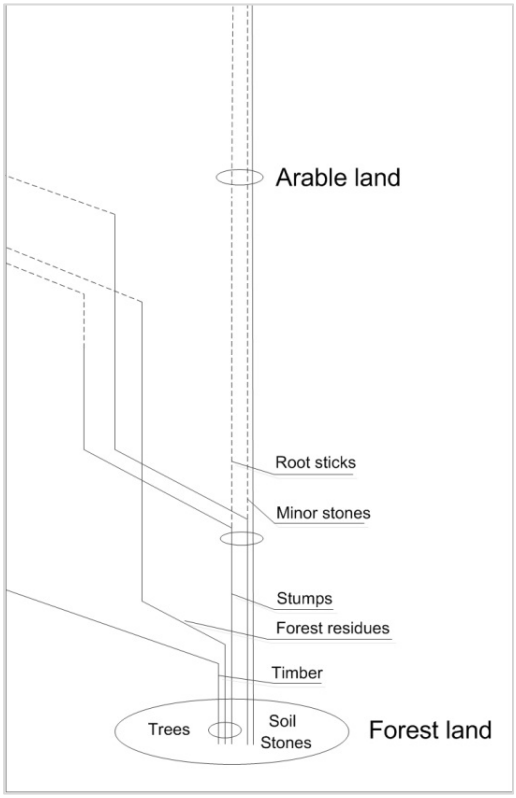


Figure 35. Transforming Forest to Arable Land
Generalized Notational Scheme (cf principal sketch (Fig. 8): The rings indicate a totality such as a tree, taken apart into timber, forest residues, and stumps; the dashed line signifies the decomposition of rootsticks, and crushed stones into the soil.

In the past (and sometimes in the studied cases, too) forest residues and stumps were (will be) burned on site.[95] Even stones nowadays represent a value: one farmer, when I spoke to him, was soon to have the tons of stones crushed and sold as filling material. Land clearance may appear attractive due to this option of transferring all parts of the former forest to new use, which may

[94] Farms CF 9, CF 4, CF 6, CF 2 (one of two cleared parcels).

[95] Farms CF 6, CF 2, CF 7.

make it possible to recoup the fuel and machinery costs incurred in connection with the clearing.

Technology and Clearance Services

The technological development of crushers, innovative excavator buckets, or simply robust and powerful machinery is of importance in connection with forest clearance:

"No-one clears land by hand anymore, so there's nothing to it – you just get an excavator to do the job" (farmer interview, modified);
"It [clearing arable land] takes time but it's not as hard work as it used to be" (farmer interview).

Clearance-related technological improvements can be regarded as part of the overall mechanization in 'modern' resource extraction systems. The innovations utilized in crushing devices used in the clearance projects derive from innovations in turf extraction or preparation of roads on sea ice or of forest roads, as well as developments directly related to forestry according to the farmer and expert interviews, as well as Tedestedt (2010, pers. comm.[96]). In the context of land reclamation, such new technologies considerably lessen the effort of clearing forest land, providing for new levels of endurance compared with the past. A crusher makes it possible to clear land in a manner "*that would make our ancestors turn in their graves*" (farmer, in Tedestedt 2010). Indeed, the availability of technology might be the trigger for clearance: the farmer on the farm CF 11 explicitly explained that the motive for his clearance project was that a crusher had appeared in the neighbourhood. On several farms studied, using the crushing option in the clearance project has speeded up the process as an alternative technique for soil preparation on logged lands or lands with forest regrowth. However, forest clearance still takes time even today, despite the existence of machines, which deal with the toughest part of the job. It takes mental endurance to confront the materiality of things, stones being the case par excellence. If time represents the most important resource a farmer has (as one of the pilot interviewees maintained), then however much help there is to be gained from modern machinery, clearance projects meet hindrances on farms where there are other ongoing project commitments.

Figure 36a,b. Status of Clearance Project at Visit, Farm CF 2

[96] Additional sources such as videos demonstrating crushing technologies on the crusher manufacturer's homepage and on YouTube support this picture of the background of crushers.

Crushers seem to be rarely available, too. The retailer of agricultural machinery told me he had only sold three crushers during the last five years, and his customer base is spread over a rather large radius – a conclusion borne out by the fact that one of the interviewees on the island of Gotland purchased his crusher from this retailer in Northern Sweden. Between 2000 and 2005, he did not sell any crushers at all. He added that, ten years ago, he would have been astonished if anybody had inquired about crushers for land clearance. Farmers report that in all of Sweden there are two high-capacity crushers, which can deal with head-size stones. One farmer contact told of his plans to contract one of these machines to prepare his clearing next spring; and another disclosed his plans of purchasing such more powerful crusher, so that he then could specialize on taking on contract work in those places where the terrain is difficult. It therefore looks as if, for example on the whole of the island of Gotland, there might be only one operator who provides contract crushing. The farmer, EXP 1, who offers clearance work on a contract basis using his own crusher, had by August of the year we met already done 330 hours of contract crushing; in total, the crusher purchased a few years earlier had done 700–800 hours.

For a farmer utilizing such crushing services, new technologies, which often involve hiring an external contractor, are costly options. A crusher and a tractor with the necessary capacity (170 or 250 h.p. as reported) represent expensive investments (EXP 1, EXP 2), the driving takes a lot of fuel, and crusher teeth made of expensive hardox wear-resistant steel suffer wear and tear and need to be replaced. The two farmers I spoke to who provide contract clearance services both charge a higher hourly rate than for other types of jobs. That said, in spite of the expense this option might be the most attractive solution for a farmer with a heavy workload and little extra time available. After all, clearance services present the farmer with a directly sowable soil, and free him from the time-consuming tasks of digging up stumps, stones, and rootsticks. The time and effort needed for crushing can be 'imported', so that all that is left for the farmer to do is "*just to sow*" (farmer interview) – comprehensive contract services of this kind are "*a great help for the farmer*" (expert interview). A farmer can thus choose between investing time or money in the clearing, depending on how much of these two resources he can mobilise, I would suggest, as well as on the equipment to which he has access. In fact, one can see how on each farm a unique combination of who does what on the clearance project has been implemented, often evolving as the project advances. In many cases, basic implements that can also be utilized in other farming activities have been purchased in conjunction with the clearance project(s), such as robust harrows, disc harrows and stronger stubble cultivators, or a smaller excavator. One farmer contact reported that he used an old plough specifically designed for land clearance. The variety of equipment and praxes observed illustrates that clearance is not a routinized part of farming – in other words, the setting of the clearing is not yet a stable one but evolving. The target of the clearing work – arable soil – needs literally to be produced at the site by observing what is there and removing what does not belong to arable land use.

For farmers who own clearance-specific devices such as a crusher and have developed clearance-related expertise, providing clearance services on contract is an attractive option. Clearance services may embrace a team with one man using an excavator with the special bucket for removing stones/stumps, and the second one driving the crusher. A farmer with a crusher in a region definitely has an asset, given the current

interest in land clearance (cf. Solbär 2011), and contract work represents an opportunity to make use of, and recoup some of the outlay for, the expensive machinery. Furthermore, contracting serves to strengthen the social web of the neighbourhood, as farmer statements indicate: contracting generates working opportunities, and thus contributes to an economy that enables people to keep living in the countryside. If there is a crusher in place, it will provide work opportunities for people, one farmer explicated; the availability of a crusher is additionally described as an important potential resource, so any given crusher should be kept in the region and not be sold to someone living further away even if it could bring in ready money upon sale.

Where to Place New Land?

The placement of a clearing on the farm domain is directed towards the objective of reaching locational gains for the farm's agricultural activities. These are targeted by the farmers besides the various general benefits that can be achieved by clearance discussed previously, such as gaining owned land more cheaply than buying it from another landowner. The locational gains embrace 'improvements' to sizes and shapes of fields; the distances involved between the fields and the farmstead are of importance to farmers in their concrete placement decisions when clearing land. The mobility requirements arising in and through farming are a significant factor, as spatiality translates into distances and time expenditure. Location should thus be read as location in timespace. The clearance cases studied demonstrate that clearing is implemented for three types of reasons: first, to re-shape and/or re-size existing fields; second, to reduce distances between the farmstead and fields (i.e. clearing as a means to gain land close-by); and third, to alter and adapt a specific neighbourhood situation. In the following three sections I focus on each of these.

Clearings in Forests

The three clearings that have been placed in forests – albeit with road access and relatively close to the farmstead – amongst the cases studied represent exceptions from the otherwise indicated tendency to have the clearing adjacent to existing arable fields, often with the aim of merging the lands into a single unit.

On the farm CF 1, characterised by large distances between fields, the farmer was finally able to purchase a property by which he gained land suitable for clearance, with level ground and at a road crossing not too far from the farmstead. This clearing (1.5 ha) with forest on three sides has been given a fairly rectangular shape (see Excerpt from and the Farm Land Map Farm Farm CF 1, Appendix V). On the farm CF 5, the farmer has likewise created a fairly rectangular clearing (20 ha) surrounded by forest (Fig. 37), with the physical geography and property borders given as the explanation for the shape of the clearing.

Figure 37. Clearing in Forest, Farm CF 5
Note the near-by location of the farm centre (below right). Background Orthophoto: Swedish Mapping, Cadastral and Land Registration Authority (Use agreement i2012/927 Lund University).

On the farm CF 9, one of the clearings (3 ha) has been placed near two fields which are separate from the rest of the land managed and have direct road access. The clearing, being placed adjacent to these two existing fields, does not directly enlarge them, but instead adds a third field at the site (Fig. 38; Farm Land Map Farm CF 9, Appendix V). The reasons for this placement have evaded me, as my focus on this farm was directed towards the two other clearings near the farmstead that are discussed below. Based on the geography at the spot, I speculate that the location has to do with the road access and the fairly level ground here in contrast to what is directly nearby, while property borders seem not to play in.

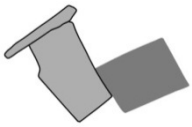


Figure 38. Clearing (right), Farm CF 9

Enlarged and Reshaped Fields

A large proportion of the clearings studied represent an enlargement and/or reshaping of existing cropping/grazing spaces. The farmer on the farm CF 4 has carried out forest clearance and domain management (the pursuit of organising the whole farm domain in a more optimal manner, see chapter B7) in order to gain access to more land, with rationalization of land management an additional end (Farm Land Map Farm CF 4 (excerpt, Appendix V). Thus, the northern clearing (16 ha) is on land purchased recently, targeting an enlargement that follows the property border (notably, there are several managed fields close by). However, not all of the forest land on this piece can be turned into arable land, as there are hindrances in the forest. In addition, the forest cleared in the south (8 ha) was part of a farm purchase, in 2007, which included 40 ha of cropland. The farm buildings, and the land on which they stand, of this purchased property were sold on to a third party, and the pine forest on this land, aged between five and 100 years, was felled in 2008/09.

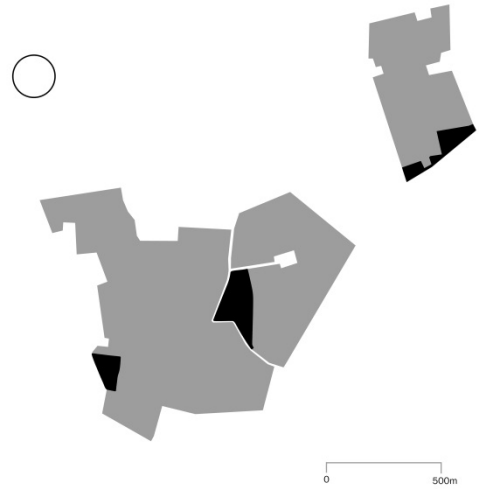


Figure 39. Shapes of Clearings, Farm CF 6
Enlarged fields (grey), clearings (black), farm centre (encircled)

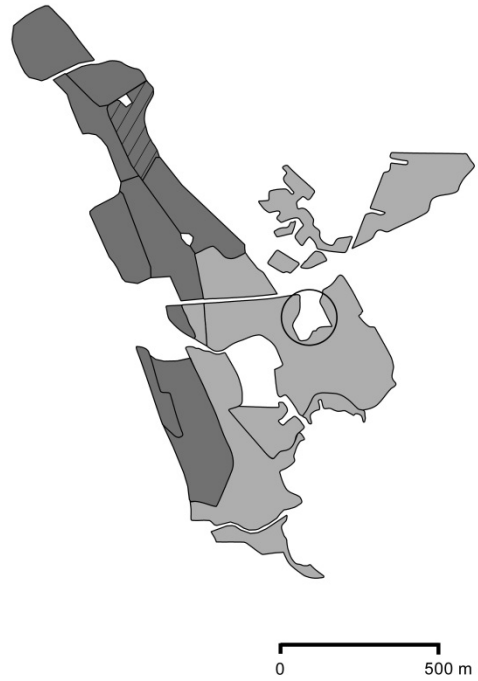


Figure 40. Clearings, Farm CF 9
Arable land (light grey), clearings (darker grey), farm centre (encircled). In part, the southern clearing comprised a pasture with stumps and some forest prior to the 'second' clearing for cropland.

The farmer describes how "*the land is as the ice left it*" (farmer interview), alluding to the last glaciation period; the exposed stones tell a story straight from that time. This latter clearing remakes the existing field into a larger rectangular piece, in that it follows the property border and all the forest land on the piece has been transformed into arable land. In addition, the farmer showed me two further clearings from 1991 and 1995, respectively, which aimed at gaining a larger continuous field in the first case, and achieving a better field-shape in the second case – both of which, he maintained, made for more rational tilling. The background to the recent clearance projects is the need for more land for manure spreading, but the farmer also mentioned that the reshaping effect optimized the tilling work. The farmer on farm CF 6 describes the gains for land use activities that come from reshaping 'a corner', in this case approximately 1.3 ha of a large double parcel (c. 56 ha) (Fig. 39, left; Farm Land Map Farm CF 6, Appendix V). The felling of a ninety-year-old forest was timely; the forest will be regenerated, as the saying goes in forestry, but only partially, while the afore-mentioned corner is under conversion to arable use. As the main motive, the farmer gives the abatement of soil damage through compaction by heavy equipment, e.g. when spreading slurry on the field: together, the clearing and a newly laid road allow for access to the field from a new direction (from the west). With the clearing accomplished, there will be less driving over the land, the farmer explains, as the slurry tank will then be empty at that end of the parcel. Now the parcel will be slightly larger and it will be possible to leave the field directly at this end, whereas previously it was necessary to drive back over the land again. As supporting measures, an existing ditch was piped and covered (Fig. 42, 43) and existing drainage complemented and improved by a new ditch (Fig. 44). The subsurface drainage makes it possible to turn with the tractor and implement outside the field. This means that the farmer can reduce the turns that are taken on the field. In all, the clearing and the other measures together bring an improvement allowing for effective use of the whole field on this large farm (total managed area: 378 ha of cropland). At the same time, on this farm, there are two other clearings under work (Fig. 39), these are discussed below in the section What is Adjacent…

On the farm CF 9, in addition to the already-presented clearing in the forest, the clearance project embraces two enlargements of existing fields, representing a substantial expansion (19 ha) of the cropland and pasture area near the main farmstead (Fig. 40).

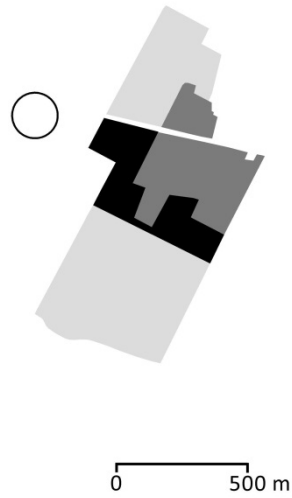


Figure 41. Clearing, Farm CF 3
Owned forest (light grey), owned fields (grey), clearing (black), farm centre (encircled)

On the farm CF 3, the projected clearing is described as only a small lot (8 ha, with the farm's total arable area being 250 ha, Fig. 41). Nevertheless, what it does is to open access between the farmstead and the field alongside the main road – driving on main roads with tractors and implements was often commented

Figure 42. Clearing, Farm CF 6 (see Fig. 39, left)

Figure 43. Piped Ditch Leading to the Clearing

Figure 44. New Ditch in line with Piped Ditch (Fig. 43)

upon as a strongly negative element by the farmers interviewed. In addition, the farmer points out that tilling the enlarged parcel (20 ha) will take the same time as previously (despite the addition of 8 ha), a calculation which seems reasonable when considering that the previous shape of the field presented a jagged interface between the forest and cropland. It is clear that when it comes to tilling the land, the farmer will indeed make the time savings he mentions in the sense that he can till more land by the same amount of time (see front cover photo (above) showing this particular clearing).

On the farms CF 2 and CF 10, too, existing cropping spaces are to be enlarged by (the placement of) the clearings. Both farmers lay stress on the large continuous fields obtained by clearance. On the first of the farms, the placing of the clearings facilitates the creation of two new parcels of 14.5 ha and 8–9 ha, respectively (Fig. 45) – the latter field size, the farmer explained, depending on how things turn out in practice when preparing the land. The farmer maintains that the fields will be larger and 'in one piece', i.e. considerably more rational to till, with rationality here equating to the tilling being uninterrupted by partitions and the like. The shape of these clearings depends directly on property borders, as the land has been purchased with the express goal of clearing all the forest to create arable land.

On the second farm, CF 10, the tilling space will be as large as 60 ha with a fairly rectangular size and including both owned and leased fields and two clearings of 5 ha and 11 ha (Farm Land Map Farm Farm CF 10, Appendix V) (for additional discussion of this case, see Chapter B7). This case is a further illustration of the internal rationalisation efforts on large farms, expressed among other things in the desire to achieve "*straight lines and large unbroken pieces [of land]*" (farmer interview, modified).

Figure 45a, b. Two Clearings to Enlarge Parcels, Farm CF 2

Upper figure: Previously owned parcels (yellow), clearings (black lines) 12 ha and 2 ha, new parcels (black circumscribed) upper 14 ha, lower 8-9 ha, water courses (blue), landed estate borders (red). Background Orthophoto: Swedish Mapping, Cadastral and Land Registration Authority (Use agreement i2012/927 Lund University). Photo (below): Clearing 12 ha in the landscape.

Figure 46a, b. Southernmost Clearing, Farm CF 9

Figure 47. Field Enlargement for Pasture, Farm CF 1

Figure 48. Fallowed due to Shade, Farm CF 6

Distances

The second spatial motive behind the placement of a clearing is the desire to reduce transport distances. This motive has been central on the farm CF 9, where other motives are present intertwined with the gathering of the land managed near the cowhouse (for a discussion of the background to the clearings on this farm, see B2, p.85/86). The main end, according to the farmer, is to gain more manure spreading area and have this land near the cowhouse instead of having it further away. In fact, 12 ha of cropland held on lease at a relatively distant location was relinquished subsequently to the clearings getting included to the farm domain (see Farm Land Map Farm CF 9, Appendix V). On this farm, the swapping of the leased land for the cleared land has shrunk the farm domain spatially and the landscape immediately next to the farmstead has been 'opened' to increase the existing arable space. On the photos below showing the same spot, newer (pasture and cropping) and a few more years older clearings (pasture only, closer to the lake visible in the picture below) can be discerned (Fig. 46). The fact that leaseholds are taken-up or terminated may introduce instability into other parts included in the farm domain, which can have ramifications for land use and land cover. This is because, as Stenseke (1997) indicates, the inclusion of additional fields in a farm domain may cause a relative redistribution of fields in relation to the farmstead and/or the farm domain as a whole. Such inclusion of additional fields occurs also when new fields are cleared to be included in the farm domain.

On the farm CF 1, the subsequent clearings after the first clearing placed in forest concern enlargements of the pasture area near the farmstead. The direct motive for clearance is the need, due to plans to increase the herd size from 30 to 40 dairy cows, for grazing land near the

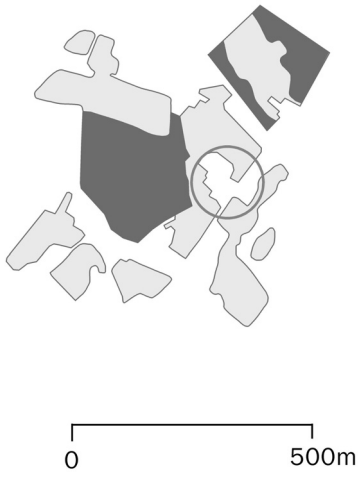


Figure 49. Clearings for Pasture, Farm CF 1
Clearings for pasture enlargement (upper right), contiguous with the lands around the farmstead (below left).

farmstead, in order to have the cows near to milking facilities; the spatial demands of the obligatory summer grazing period for cattle is mentioned by this farmer just as by other farmers. Firstly, a 1.3 ha area of pasture was enlarged to cover 4 ha by clearing adjacent birch forest; secondly, a 4 ha parcel was felled and turned into pasture, creating a continuous grazing space at the farmstead (Figs. 47, 49). The objective of the targeted increase in production was to be able to hire additional personnel (though this was not possible until later, due to a drop in the farm-gate price for milk). On this farm, there are considerable distances to cover to reach managed land, and clearing is generally motivated by 'moving' cropland nearer (see Farm Land Map Farm CF 1, Appendix V), since distance consumes both time and fuel, as the farmer explains. Similar descriptions of the preferred locations of grazing land were offered by farmers on the *land use farms*, who also pointed out that access to grazing land near the farmstead minimizes cattle transports and makes the daily checking of the cattle when at pasture less time-consuming (see chapter B2, section Near the Cowhouse).

What is Adjacent…

Thirdly, the placing of clearings may depend on what is immediately adjacent to the land in question (including the land use practised on this land) besides being about reshaping and resizing, and minimizing distances. Two clearings are explicitly motivated by wind and shade effects. On the farm CF 6, a part of a field was shaded by a forest stand to the south (Farm Land Map Farm CF 6, right, Appendix V), the crops did not thrive and the farmer had fallowed a stretch of the field (Fig. 48). By the removal of the forest stand (90 and 35 year-old), the jagged interface between forest and cropland disappeared. The cropland to the south is not managed by the farmer.

A shading effect was also mentioned by the farmer on the farm CF 2, in combination with wind. On one of the fields, the yields from cereals and hay were clearly affected by slower ripening, and at times, a wind-tunnel effect generated by the geography (which the farmer detailed on a map) would fell the crop, altogether offering a good meal for cranes on their way to south. So, in all, the adjacent field was negatively affected by the forest which has now been felled to produce more of arable land, and to enlargen existing fields as discussed above.Yet another 'wind-induced' placing of a clearing was encountered on the farm CF 6 (Farm Land Map Farm CF 6, clearing in the middle, Appendix V). This clearance project emerges in conjunction with a wind-power project on a neighbouring site (on land owned by the farmer). Land bought by the farmer's father had, soon after purchase (i.e. forty-three years ago), been planted with spruce. It was estimated that the shade from this forest stand would reduce the wind turbine's output by 4–5%. The farmer explains that he agreed to fell the rather young stand only on condition that the wind power company would pay for the

laying of a new road to adjacent fields, i.e. this clearing is connected with a re-routing of an existing road. This spared him from ending up with a small, separated parcel. In this case, the location of the clearance site depends on neighbouring land use – the wind power project – together with the possibility to make the land useful as cropland. In the previous shade-related cases, it was the 'neighbouring' crop putting demands on its surroundings (the demand for no shade!) – here, it is the wind turbine exerting demands on its surroundings. Interestingly such a small increase in power output is invoked as a justification. What this example shows is that a bundle of reasons and motives might boil down to a good opportunity to enlarge a particular field and the farm domain (given the possibility of improved access to the new field!).

In this context, I revisit a finding from the *land use farm* cases; the farmer on the farm LUF 8 had an increased number of dairy cows and kept driving to distant fields, mowing and bringing home the hay, when an opportunity to buy directly adjacent land arose:

"INTERVIEWER: How come that you bought more land? How did it come free for sale?
FARMER (HUSBAND): He would quit [farming], due to old age, and we needed for our cows [non-hearable] yes, and it lay just adjacent, thus it was appropriate.
INTERVIEWER: Did you increase the number of cow at that time?
FARMER (HUSBAND): We had already built [a new cowhouse] and had the number of cattle, but as this came for sale, one could well do with some more land …nearby, thus one could leave the cattle to graze themselves, previously one had to drive, mowe, gather and drive home the fodder, but now one just could let them go for grazing by themselves.
FARMER (WIFE): Precisely, dairy cows should be kept near the home to be able to milk them twice a day.
INTERVIEWER: That was then like winning a prize on the lottery.
FARMER (HUSBAND): Yes, one could say so. …it is contiguous with the longer side against our's, so it could not become better."

The statement 'the land could not have had a better 'location' in relation to own land' is important to observe, as it highlights the practical accessibility of the new farming space in relation to the existing and points at the end of placing new land (purchased or cleared) adjacent to already owned land.

Final Remarks on Forest Clearance

The temporal extension of clearance projects deserves a final remark. The process of clearing takes time – which is obviously not a surprising thing to say, as transforming the felled lot into arable land presents the farmer with a list of tasks that have to be performed one after the other, while other farm projects require his attention, too. Various unexpected and uncontrollable happenings have caused clearance projects to take more time than originally envisaged (farm CF 1: several rainy summers, too wet to work on the clearing; farms CF 1, CF 5: far more stones than expected; farm CF 9: the plans have been hindered due to unexpected changes in the time-income of the farm). The authorities demand that within three years of the forest being felled, 'something' demonstrating that the land is under conversion should be visible on the land (Danielsson, pers. comm.; Ringagård, pers. comm.; Swedish Forest Agency 2008).

Clearing is thus ordered in activity sequences much in the same way as tilling. Albeit the sequences seem more tentative and vary between different clearance projects on one farm, or even to some extent within one and the same clearing,

due to unexpected occurrencies and insights being gained as to better ways of working. The time frame of clearance projects varies depending on the methods adopted, and sometimes on the weather; one full year seems to be the minimum, although clearance projects can take several years. The goal-situation, which gives clearing activities their orientation, is the objective of achieving an arable field; this is achieved by removing the things that are in the way for arable use. There is an interesting difference between the two kinds of land use activity concerning arable land described in the thesis. The first produces land-cover continuity and is about maintaining, thus re-producing, the arable land. The second produces land-cover change by transferring land from one land use to another. The first is about warding off unwanted things, and upholding an existing status. This goal-situation is present 'all the time', and the activities required to meet its demands easily become routinized as the discussion in chapter B2 on Tilling Work indicates. This might explain that this type of activities can bind the farmer's time in future – a clearance project can be dropped any time, or rather be let aside for a while, if one chooses so.

Figure 50. Clearing, Farm CF 5

B.7 Moving, Placing and Gathering Land

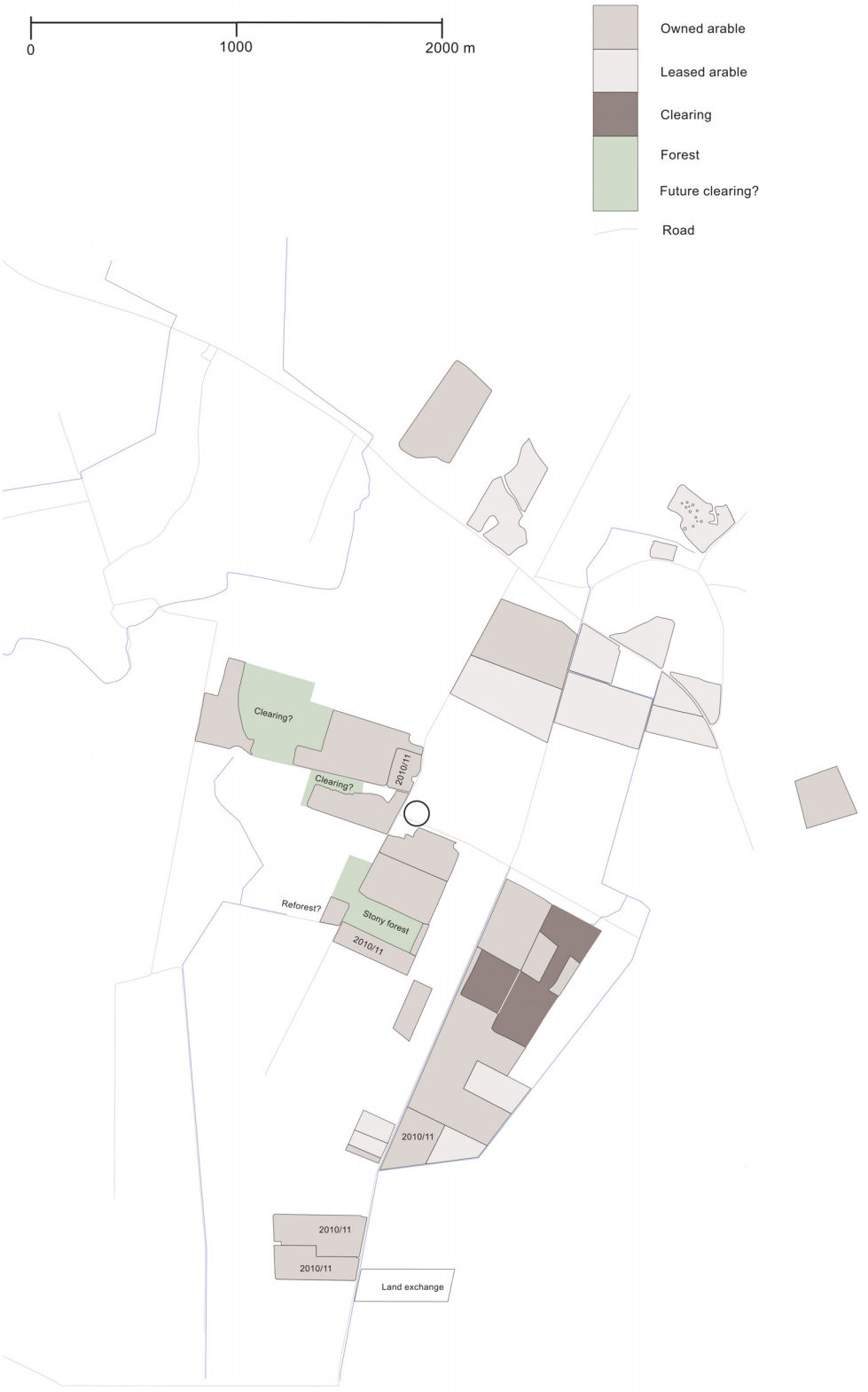
When discussing the clearance projects, the farmers frequently presented various kinds of land deal that besides the clearings included land exchanges and purchases, as well as lease agreements. Because such land deals are mentioned together with clearings, I have concluded that they are related. I came to view clearance as just one of the measures applied on farms in order to reshape not only single fields, but also the whole domain such that farming is made easier and/or the farm can be expanded. These measures can be seen to be part of domain management, by which the farmers pursue the objective of 'moving' arable land closer to the farmstead in order to 'place' it at an accessible distance and to gather the land they manage into continuous stretches that can be tilled as 'a single piece'. Domain management is about reorganizing the farm domain. The background to domain management is obviously the existence of the farm in a variously constrained neighbourhood situation, where access to more land is not a straightforward matter (as it would be if it could follow, for example, a principle of concentric growth). Farm neighbourhoods simply do contain other farms; openings in the space of the neighbourhood that access to land represents show up irregularly and at varying distances.

It seems that such separate land deals follow an overarching goal. I bring up this issue, as it appears that it has not been discussed in previous research, even though the primary focus in my project has been on forest clearance on the *clearance farms*. Domain management being an overarching strategy, it in fact makes a case of the Hägerstrandian call to retain the landscape totality intact, as discussed in Part A (see chapter A1, p. 19). The cases studied here indicate that various types of land deal should be considered together from the point of view of farming practice. I call below the various land deals 'moves' and include examples of such moves from two farms. The selection of the two examples presented in this chapter depended on availability of material documenting a collection of such moves.

The two examples presented in detail derive, firstly, from a large-scale agricultural enterprise (farm CF 10), and secondly, from a farm on which such moves are part of a withdrawal from engagement in agriculture (due not to retirement but to non-farming employment, farm CF 7). While the first example shares aspects with other interviewees' reports concerning spatial 'problems' regarding access to land[97], the second example represents as I suggest in understanding a case of domain management being enacted above all in pursuit of time-economic gains.

The first example (Fig. 51) comprises a land purchase in 2010/11 including arable land, and a land exchange. By these moves, the farmer gained a large rectangular cropping space (60 ha) and more land close to the farmstead. To begin in the south on the map, two adjacent parcels to the left of the road were included in a land purchase together with three other parcels (marked '2010/11'). To the right of the road lies a field that was 'lost' in the land exchange (marked 'land exchange'). Further upwards on the same side of the road, the large cropping space is depicted, including owned (grey) and leased land (light grey) and the two clearings of 5 ha and 11 ha, respectively (dark grey).

[97] Especially farms CF 4, CF 2, CF 1, also CF 5.


0
1000
2000 m
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Clearing
Forest
Future clearing?
Road
Clearing?
2010/11
Clearing?
Reforest?
Stony forest
2010/11
2010/11
2010/11
2010/11
Land exchange

Figure 51, previous page! Domain Management I, Farm Land Map Farm CF 10
Note: The farm domain has two additional parcels (9 ha), lying outside the area depicted, and left out of the map because their location was not available on the occasion of the interview.

The cleared land was gained by the land exchange that preceded the clearing (this piece of land is larger than the field lost in the exchange, which compensated for it being swampy, thus non-productive. forest land). All of the land here consists of peat land, with highly productive organic soils. The transactions made create, as the farmer stresses, a 'large piece'. Furthermore, land deals nearer to the farmstead (encircled) place more land under management nearby (this is not a dairy farm, but a farm with cereals and vegetables only, thus there are no cows needing grazing land near the cowhouse). South of the farmstead lies one of the recently purchased fields, but also a forest stand (owned) with stony soil and a small parcel separated by roads on two sides and additional owned forest on the third side. The farmer reasoned that the smaller parcel would probably be afforested within five years. It is close to the farmstead, so this consideration is more about the small size and the impractical shape of the parcel and the surrounding situation that does not allow for improvements, as there are roads and land owned by others around it, in addition to the forest, which is not ideal for clearing. To the west of the farmstead, finally, lies one more recently purchased parcel, and forested areas (green dashed polygons) which the farmer thinks he might clear someday, partially or wholly. This farmer put much stress on the insecurity of informal management agreements, finding them problematic because "*if you want to expand, you have to have control over the land, you can't count on lease agreements and the like in the long term, that's too insecure*" (farmer interview). In the *clearance farm* cases studied, one recurring topic has been that relying on non-formalized lease agreements is insecure, while this line of reasoning I did not hear when visiting *land use farms*.

While the farmer in this farm example is expanding his arable production, hoping for increased yields from the good soil on the cleared land when the clearing will be completed, the second farm example of domain management demonstrates a farmer carrying out similar moves in order to withdraw from farming as a livelihood (farm CF 7). As in the previous example, land exchange and clearance are combined to produce a large continuous parcel without partitions (32 ha, Fig. 52). This new, larger cropping space lies in part on owned (22 ha), in part on long-term-leased land near the farmstead. The owned land excluding the land exchange had long belonged to the farm estate, although part of it was forested: the present farmer's grandfather started by clearing half an acre down by the road in the 1930s (dashed stretch of land, see map). The clearance project initiated by the grandfather, continued by the father, had recently been resumed by the farmer (red, see map). For him there had been 4 ha of forest still to clear; two plots doable for one man during one winter had been accomplished, and a third – only a small strip of trees (Figs. 52, 54) – was projected as a task for the upcoming winter. Directly adjacent lies a field (marked by a single star) that was gained in exchange for a machinery shed and a part of an arable parcel. This exchange merits more detail, as the land given away is located adjacent to the machinery shed and was cut off from a field of which ownership has been retained. The cutting-off is indicated by a single star on the map (near the farmstead on the other side of the road) and produced a 'new' parcel with 'straighter lines': "*I thought that was a good deal*", the farmer maintains.

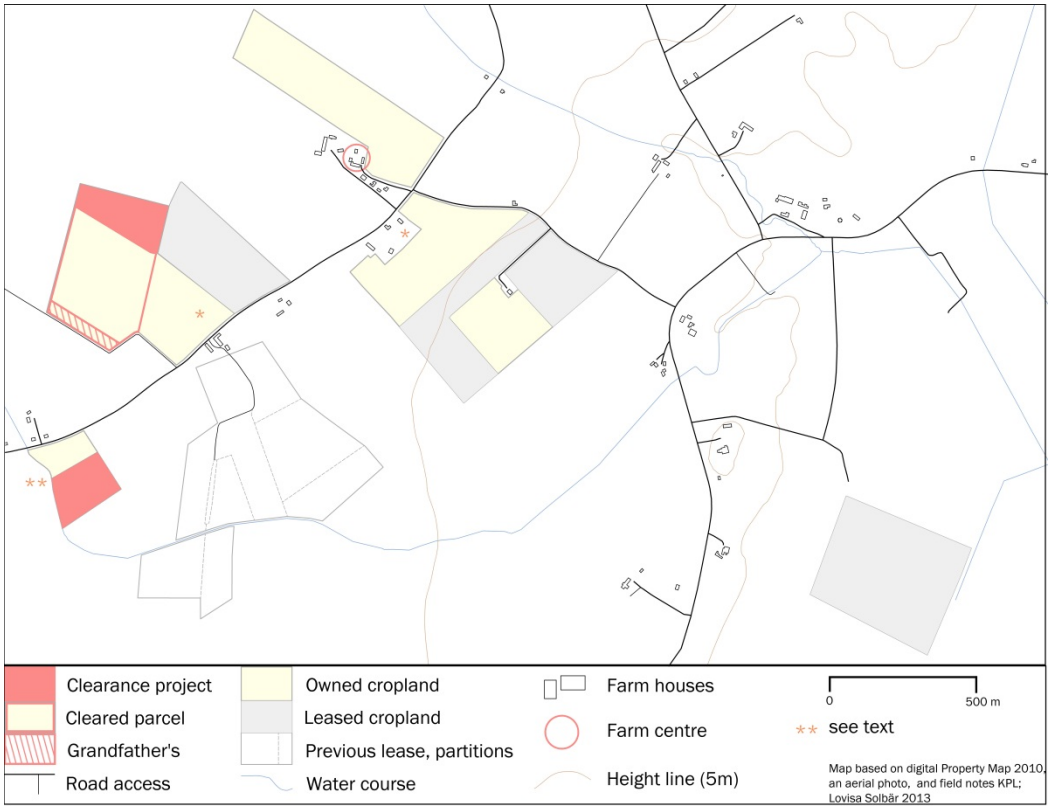

Figure 52. Domain Management II, Farm Land Map Farm CF 7

Figure 53. Clearing and Plans for Domain Management, Farm CF 4
Background orthophoto: Swedish Mapping, Cadastral and Land Registration Authority (Use Agreement i2012/927 Lund University).

Thus several changes were effected in the same two to three-year period: arable land including a previous clearing was sold off (double stars on the map, marked as owned land and clearance project); the land–machinery shed exchange deal was made; and a long-term lease agreement running since the father's times (27 ha) was relinquished (Fig. 52, 'previous lease'). The lease agreement had become unsatisfactory due to recurring annual rent increases, the rather poor soils, and constraining parcel subdivisions – "*you couldn't cultivate it in one piece*" (farmer interview). While this farmer is not expanding, several farmers in his immediate neighbourhood are doing so, and they are clearing land for arable use. This situation might go towards explaining the rent increases for the lease. I would characterize this farmer as an 'active' farmer: he actively engages with the land, albeit with the somewhat paradoxical objective of decreased engagement. He carries out domain management along the same principles as farms expanding their production and their domains – i.e. he rationalizes, which it is important to note. Not only large-scale expanding businesses are keen on rationalisation. Rather, the farm example above with the domain-management measures being undertaken points up the importance of time-economy in farming overall. This farmer emphasises the fact that a large continuous piece of arable land will be obtained (a rationalizing move), while at the same time telling that he "*has neither the strength nor the time*" (farmer interview) – a man in his fifties – for a deeper involvement in farming than his current level. (It can be noted here that previously, the agricultural production of the farm used to embrace both cattle and crops, before the farmer geared down to arable only). Other previously-mentioned aspects of importance in clearance projects appear here, too, such as gaining control over land (through ownership); in addition, this case demonstrates (in the shape of the clearing project carried out over several generations) how the roots of clearance projects lie in the land and especially the time-depth perceived in it.

Domain management implies a deliberate and on-going engagement in the guise of occasional discrete land deals here and there. Another farmer who has recently bought, exchanged and cleared lands, has already started speculating, in a manner similar to that of the farmer in the first example, on his next move concerning a piece of land that he today manages on lease (Fig. 53). If he was offered to buy the land around here, he would clear the forest stand adjacent to the field, because "*it's good soil*" (farmer interview).

Reorganisation of the farm domain remaining the goal of domain management, it is of importance, in this context, that land when available also represents a potentiality (implying a reserve for the future); this is why the farmers seek to take advantage of land-acquisition opportunities. The farmer on the farm CF 1 has bought land several times (they started with 18 ha and own today 95 ha of arable land). The farmer had this to say to explain his most recent land purchase including forest, some non-productive forest, and arable land: "*If somebody else had bought the land, I would have lost 5 hectares of arable land*" (farmer interview). This suggests that arable land in the region is a scarce resource: small differences count. This farm in fact exemplifies a situation in which, when land was not available within an acceptable distance and the farm needed to expand, the clearance project offered the Solution. The continuation of the clearance project was dropped when arable land was after all put up for sale and lease. In this is example, too, there is an interaction between clearance, leasing and land purchase as moves in domain management, which in this case is driven by the overarching goal of placing

land close at hand, at the same time as such domain management accommodates flexibility in following spatial intentions. Another farmer intensively working on a clearance project (20 ha) recently promptly accepted a tenure offer from a neighbour who fell ill. An opportunity to gain access to more land may thus appear unexpectedly in the nearest neighbourhood, and if so, the chance is readily picked up. Taking on the management of land that has been left 'managerless' also shows how both parties, in both the above-mentioned cases, share the value that land should be kept open. It is easier not to need to clear, but it is also a good deed to manage somebody else's land.

My conclusion is that spatial qualities attaching to the single pieces of land in different ways appear to be utilized by farmers as they strive for best farming practice in their specific circumstances. The spatial qualities are either constraints generated by materiality such as distances between fields, shade, or corners which hamper ease of cultivation; or benefits similarly created by material settings such as fertile soils, or by neighbourhood situations which either enable or constrain the 'moving' of land closer to the farmstead. Precisely these kinds of thinking were exemplified above as aspects of overall domain management, and the examples illustrate the flexible relationships of spatial intentions and various separate, step-by-step solutions. Overall, the moves of domain management aim at making land 'mobile'.

Figure 54. Advancing Clearing, Farm CF 7

Part C. Farm-Based Processes and Landscape Effects

To recapitulate, this thesis aims at proposing interpretations of the farm-based processes that produce specific land-cover dynamics concerning the distribution of forest and arable land. In Part C, I elaborate on interpretations of the farm-based processes and the landscape level implications of the land-cover dynamics discussed in Part B.

In the first chapter Land Management and Time-Economy, I focus on aspects of time usage. I propose in this thesis the concept of *time-economy* for describing the balance between the daily in-flow of time resources that can be allocated to land management and the time-demand of land management tasks (a kind of out-going time, I return to define this concept). In the second chapter Orientations in Land Use, I focus on land-cover continuity in the case of the sustained openness of arable land demonstrated by the findings in this study. As explained earlier, management of arable land is not legally required by itself (see Rural Boreal Sweden); I therefore take the continued sustenance of fields as an expression of a (land use) choice between reforestation and openness of land. I suggest the interpretation of the farm background of the displayed land-cover continuity as being rooted in valued-based processes that halt reforestation of the arable land on the *land use farms* and motivate farmers to seek solutions for continued land management despite small economic returns and/or capacity restrictions. In the third chapter Land-Cover Change in the Rural Landscape, I discuss rural landscape dynamics and land-cover change by separate analyses of the landscape dimensions of the two land-cover processes identified; I also touch upon the landscape neighbourhood as an important factor influencing land use decisions.

First, I make a short recapitulation of the farm-based land cover processes presented in Part B. Hay as the main crop and the small herds of cattle on the *land use farms* provide the landholders with flexible solutions that secure the status of the arable land. The major changes reported during 1990–2010 are that land management is increasingly in the hands of leaseholders and wild boars are wreaking increasing havoc on arable land. The *farm projects* have in the majority of cases studied transformed into 'living on the farm', enabled by non-farming sources of income such as a farm-based non-farming enterprise, farm payments (since 2005), employment in the larger towns of the region, or retirement pension. I have suggested that farmers have lowered their ambitions, targeting levels of return possibly only compensating for the inputs they put into farming; and that this has happened due to various constraints experienced. The farmers do not engage in a variety of farm-based projects besides farming; rather, the land use activities are motivated by fodder production and the striving to keep the lands open. Both the few cases in which novelties have found space on the farm

and the farmer's reasoning make plain that new activities may be incorporated if they fit in with the farmer's overall goals and the timespatial order established on the farm.

The clearance studies also show that the process of clearing land is about producing a kind of purified state, the soil as an abundance, to adapt to Hägerstrand's (1993) term for the 'fine-grained things' which are part of the *process landscape*, the arable land is created by removing what accordingly can be termed coarse-grained things such as root-sticks and stones. The farm studies indicate that both the producing and the sustaining of open arable land take time as well as effort; I therefore conclude that the ability of farmers to invest time in farming is crucial for land management. New solutions of land management are asked for in the face of a reduction of farmers' time input into the arable land due to allocation of time to other occupations. Such solutions include land management by leaseholders, and less intensive modes of haymaking and animal husbandry that allow for partial withdrawal from farming activities while continuing on the path of farming (farm management). Lease-out does not necessarily entail intensive land management on leased fields – in part due to the leaseholders' own projects being less intensive, in part due to the small size of many fields triggering a less intensive mode of cultivation.

C.1 Land Management and Time-Economy

"Everybody gets 24 h at his/her disposal every day, and everyone uses every hour every day." (Ellegård 1999:168)

This section deals with landholders' efforts to shape their land management rationally. These efforts are investigated from the perspective of *time-economy*. This concept that I propose in this thesis connotes the balance between the daily in-flow of time resources that can be allocated to land management, i.e. the available time of those involved in land management on the particular farm, and the time demands of daily tasks arising on that particular farm corresponding to its composition of land cover types (a kind of out-going time) such as forest, cropland or grazing land. In developing this idea, I draw on Ellegård (1999) and Hägerstrand (1972); hereby I also consider the fact that different tasks have distinct environments that suit these tasks (Hägerstrand 1972:20, see section Landscape and Activity). The time demands of the daily tasks arise due to the required movements between fields or other stations and the farmstead, and the movements on fields, entailed by the fact that farming takes place in a material setting and is governed by the timespatial conditions. As described in Part A, these arise due to the materiality of land and bodies, meaning that land use is a question of mobility, of transports of farmers and machinery, and of in- and outputs to/from the fields (exemplified in Fig. 12). In the course of engagement in land management, the farmer comes to develop a feeling for the timespace conditions pertaining to the practicalities of land use on the specific farm domain. The farmer thus relates to an activity-based landscape, which in essence is synonymous with an *activity timespace* in the sense of Schatzki (2010a). The capacity to achieve good time-economy in farming is however in part about access to economic resources, such as when a farmer can buy time from a contractor.

The issue of running time(s), encompassed theoretically by the notion of *process landscape*,

can be seen to be a perpetual concern in farming: farmers feel in a hurry although things are lying still on the ground. Their incoming time must match the lists of tasks implied by the orientation of the farm project with its commitment to its specific goal. In the case of the tilling sequence example (see chapter B2, section Tilling Sequences), the incoming time resources are to be distributed in a reasonable way over the farm domain and the other tasks and locations, such as the cowhouse, in order to reach the goal-situation of having spread manure, and harvested three times, baled, and brought in the green fodder at the end of the season, while the hay needs to have been baled, too. The available time appears to be just as important a resource as the haybales and the manure.

This can also be illuminated by looking at the hours of the day we are used to counting on; the incoming twenty-four hours are an amount of time that we learn by practical engagement in activities to handle more or less efficiently and satisfactorily. We often learn by trial-and-error about our own abilities in relation to the length, or rather the space, an hour offers. Time and a variety of other resources utilized in daily life are brought into interaction with each other by the activities people engage in, as Jansund & Westermark (2013:32) suggest. This can be seen to apply to the tilling example, too, as the farmer drives round in his tractor with the 3.5-metre-wide mower to cut the hay in one small field and then in another. In this busy environment of doings, other 'things' happen, too, as is familiar to each of us from other areas of daily occupation. On the example farm this might be the neighbour asking for help with the grass in a corner of his field; the tourists setting up tents on the growing grass; officials coming to check the cows' earmarks, one in each ear; the daughters desiring to be fetched from town and wondering why the family can't go on holiday to Greece this summer either. In addition, the regulations concerning agriculture and the farm-gate prices of produce are subject to more or less constant change... Perhaps, instead of talking about a busy environment, it would be more precise to talk about extremely changeable surroundings.

The being-at-home at a place discussed theoretically in the context of framing in Part A implies that a farmer engaged in land use activities gradually acquires a praxis-based ability to assess the time demand of the farm. With reference to the idea of *timespatial choreography* (Hägerstrand 2009:157) as summing up, as it were, the continuous line which an embodied individual's activities describe in space and time, one can speak of the 'farm as a whole' as a timespatial shape or unit. What hereby becomes an experiential reality for the farmer is the timespatial shape of the farm domain, expressed by an interviewed farmer as balancing:

"All the time you have to keep thinking about what the work demands. (…) It's difficult to find the right balance. (…) You need to do things at the right time" (farmer interview).

Again, from another farmer interview:

"You need to be able to deal with everything; you need time and strength for all the things you take on" (farmer interview).

Anything additional to existing commitments is weighed up with regard to its effect on the time budget of the farm (note that this refers not only to the farmer's time, but also to the available time of all farm workers and even time that is imported' from contractors). In the quote above, time is mentioned in the same breath as strength, which I interpret not only as physical capability, but also as capacity arising from a balanced time-economic situation. This implies a lived-in situation, in which separate action

choices are inter-related and combine into a meaningful whole at the end of the day, or at least by the end of the growing season. During the study circle, one farmer formulated the view that economic viability means "*peace of mind*" (study circle materials). A stressed economic situation is an additional burden exacerbating an already time-economically demanding farming situation.

As this thesis views fields as timespaces and time and space as linked, monetary, farm-internal transport costs that arise due to the physical immobility of land (Berger 2001) extend to become time 'costs'. Tilling operations on single fields should be considered from the point of view of the whole farm domain such that land use decision-making is bound by the farm domain as a timespatial unit. From this perspective, the statement by the farmer on one of the pilot farms gains additional depth: "*Time is the most important resource a farmer has*" (farmer interview, pilot farm). The farmer has got time, more or less of it, and crucially, the time-demanding entity of the farm 'approaches' the farmer with detailed suggestions concerning the types of occupation packages that should be engaged-in. For example, a farm containing semi-natural pastures suggests to the landholder that he or she should keep cattle. Keeping cattle comes with specific time allocation prescriptions.

The experience of time consumption relative to the spatial arrangement of land and the spatiality of the fields obviously matters in land management, as farmer interviews indicate. This means that single parcels may play a role for the management of the whole unit, and that the overall time demand of the whole management unit might affect what is possible on single parcels. This finding can be seen to correspond with a location-theoretic assessment of crop choices on farms – namely, that the yields from single parcels are measured in terms of what brings the largest benefit to the whole farm:

"The cultivation of a field is not determined by what will yield the greatest profit on it, but because of joint agricultural production, by what will yield the most profit to the farm as a whole" (Lösch 1954, cited in Schmit 2006:11).

This is necessarily a relational understanding of profit, as what will be profitable depends on the production-orientation of a given farm. I would suggest that such relationality between single parcels and the whole farm also applies to the practice of farming. In other words, the management of a single field will depend on how much room the tilling operations demanded by that field and the other fields find in the farmer's timespace. The content of 'profit' could be broadened towards the sum of benefits that the farm as a whole generates for its owner – socially, symbolically and economically (these aspects will be touched upon in chapter C2). This is not to say that economic returns are not vital for a landholder/farmer; on the contrary, the survival of a farm in the long run, including the intangible values associated with it, will directly depend on economic viability.[98] The point is, rather, that this dependence is modifiable: the actual meaning given to economic viability on the farms differs according to the overall goals of farm management. The idea of 'most profit to the farm as a whole' thus gains wider significance than economic profit. In the context of time-economy, land use choices obviously should be functional in relation to time-balance, and also, bearing in mind the above discussion, in relation

[98] Cf. Nordström Källström's finding (2002) that poor economic viability constitutes one of four main reasons to quit farming; the other three are loneliness, vulnerability, and inequality (experienced by female farmers).

to the 'profit' the farm can generate (I have called this the farm project's goal/goal-situation). Specific goal-situations, such as large-scale beef production, involvement in an interest such as keeping a traditional breed, or maintaining the lawns around the farmstead on an inherited property demand free time; following Ahmed (2006), it will be necessary to keep time free for pursuing those tasks that conform to one's orientation, and, in the case at hand here, the (ambition level of the) farm project. A farm domain comes with a time demand to be allotted to land management according to its composition of land cover types. This probably would not be definable in quantitative terms, as it appears a relative factor. Firstly, quite obviously, the size of the farm domain influences the time demand it places on the farmer; secondly, the time demand will depend on the land-cover types present on the farm; and thirdly, the required time input depends on the ambition level of the farmer and the farm project's goals. I will touch upon these aspects in the following.

Cropping can be regarded as one of the most intensive modes of engagement with the land, as the land is ploughed or otherwise cultivated annually. At the very least, arable land requires one tilling visit to cut the hay, or complementary mowing if grazing is not sufficient due to a low number of livestock. The time demand a farm places on its owner can obviously be met in several ways. The farm cases in this study indeed display many ways of solving this equation. Time can be allocated from the landholder's own incoming time; some time can be added from household members or business partners, and time can be bought from a contractor or a leaseholder. Scrutinising how this time demand is met is intriguing, as the farmer is not the only player in the field. Crops have their time-cycles running from germination to ripening (with the farmer being obliged to wait for these processes to run their course); and the cattle or other farm animals similarly not only follow grazing paths but also grow and mature. In order to cope with the dynamic of the 'times in use' of the various entities in the *process landscape*, farming like many other daily occupations strives for organised activity sequences and ordered material settings. Creating and sustaining such order relies on knowing the place from a dynamic perspective, as I have suggested in the discussion above.

While the timespatial differentiation of the farm space can be seen to be a necessary tool to order the doings, over time it risks becoming rigid. The loosely shaped choreography of movements marked by stations such as fields in the different phases of the crop rotation, or cattle on pasture during the grazing season, will become in part repetitive and routinized. This can be interpreted as a sign of stability in the timespatial setting (an ordered pocket). Attaining such stability implies, however, that the timespatial organisation is not only steered by the farmer, but starts to steer the farmer. This then has the consequence that the farming activities are no longer directed solely by processes of growth and ripening (i.e. the other 'times running'), but also by the order that manifests itself as the material arrangements and the usual sequences of tasks. I would suggest interpreting the farm space in its differentiation as a mix of immobilities (settled things) enmeshed with (perceived) openings that offer the choice spaces in which the farmer can advance, for example towards rationalization of farm management.

As I listened to the farmers, it seemed to me that the question of time-economy in farming is not only about budgeting the incoming 24 hours by plainly allocating hours to this or to that; it is also a question of making more effective, more rational use of this amount of time. Rationality,

as this study has found, is not only a concern on large-scale agricultural enterprises. The farm example presented in the last chapter of Part B demonstrates that farmers other than those running full-time large-scale enterprises with employees may feel a need or desire to re-shape the farm lands in the aim of obtaining continuous tilling spaces. Rationalisation and effectivisation, for example by clearing land or 'gathering' land close by, appeals to farmers in different situations as they seek to optimize land management. Indeed, the time savings might in fact weigh even heavier in a part-time farming context, where the time usage must be distributed between several types of activities. Rationality, then, is about time-economic considerations rather than solely economic considerations. Time-economy is not relative to the scale of operations, but relative to the time that is available for their performance. The farmer in the afore-mentioned example is not planning to quit farming. He is cutting down the time input in the farm by decreasing the acreage managed and rationalising cultivation; in other words, he is manipulating the time demand of the farm domain by shrinking the domain and by placing fields next to each other so there are no distances to be covered between them.

Farmers make plain that a parcel shape, which helps them to minimise turns and doublings, is 'rational'. The shape of a field is often mentioned by farmers in the same breath as the word 'rational'. For them, when driving over a field, taking extra turns is the opposite of rational tilling:

"And then it's also about the small lots – it takes longer to work them, with all the twisting and turning, you can't rationalize in the same way [as on the plains]" (farmer interview).

Taking turns appears to take energy (though presumably not physical effort in this situation, as the tractor takes care of that). A part-time farmer rhetorically asks:

"I wonder how long us farmers will have the energy to drive around on a load of separate small lots?!" (farmer interview).

Field shapes matter due to the back-and-forth movement of cultivating a field – turns are directly reflected in the time expenditure (see chapter Tilling Work; cf. Hagenvall & Gunnarsson, 2008). A larger field is portrayed as more rational to work, and the rationality argument comes into play, too, with regard to shape: straight-bordered fields are portrayed as more rational to work than fields with irregular borders. The management of field sizes and shapes could be seen as part of the farmer's domain management. In fact, a national assessment of parcels fallowed or in less intensive use outside the subsidy system indicates that many of the concerned fields are small and irregular (Swedish Board of Agriculture 2008). The consequences of striving for rationality in cultivation are obviously straight lines and large fields: "*We want straight lines, we want a large piece*", (farmer interview), and as reiterated by another farmer:

"That field is really good; before, it was split up, with bushes here and there, and [my husband] has made it into one whole piece" (farmer interview).

The neighbour of this farm also commented on this particular field as being the only 'proper' one around.

When taking in contract work, time literally becomes money, and 'rationality' a goal:

"[A]nd then [when trying out maize] you want to choose fields that are a bit bigger, a bit more rational (…) mostly because you bring in a contractor for that, so it should be as rational as you can make it. At this latitude a field is big when it's

more than three hectares, so there aren't that many places to have it" (farmer interview).

The quote also implies a farming environment containing a larger number of what are perceived as non-rational fields. When the farmers say 'rational', they might thus mean that the work can be accomplished quickly, in a way that feels effective and cost saving, especially when the time expenditure will be paid for.

The landscape process of arable fields getting larger and more straight-bordered is previously documented. Since the 1950s in Sweden, arable fields have generally grown larger and more rectangular (Ihse 2005:278f.; Jansson 2011b). Similar has been reported from a rural landscape in Southern Quebec, Canada, during the period 1958 to 1993, with a decrease in the number of fields, meaning that those remaining are larger and show a decreased total edge length (Pan *et al* 1999).

The argument which farmers, who clear land, can be seen to advance, i.e. to make the farming work smoother and more rational, is interesting when placed in relation to the time and effort invested in a clearance project in order to ensure such smooth working conditions in one particular corner or another. This time-investment might be understandable when the importance of time in daily farming practice is taken into consideration; the reshaping of a corner brings important time gains from a more routine-oriented, day-by-day perspective. From the perspective of a farmer, these aspects cannot reasonably be separated, since balancing the time expended on farm management with incoming time is of crucial existential importance. This is very concrete, as land management depends on covering all the land in detail – all the fields, every nook and cranny – and achieving this within the limits of the allocated daily time budget and considering the other 'times running' at the farm. Farming is not viable if it is not possible for the available amount of time to meet the farm's time demand, or to put it otherwise, if the time input is not recompensed by economic returns. No one can engage in an occupation in the long run if it does not provide for a living in one way or another.

Finally, it is important not to disregard the importance of the third point concerning the ambition level of the farmer and the farm project's goals. As discussed above, the time demand posed by the farm arises from the land, the land cover types, and the size of the domain. In addition, a kind of time demand can also be seen also contained in the farm project. The farm owner will allocate time (and energy) to land management according to his/her own intentions, motives and objectives. A hobby farm or a farm run as an object of interest means, as in other areas of life, that the person with such an interest is prepared to invest time in pursuing it.

That said, the motivational background to the striving for rational field shapes can be related to the current overall 'time-regime', too. Practical and economic considerations, such as reducing time expenditure and achieving higher yield levels, interact with the endeavour to match the standard of the current time-regime of fast and effective accomplishment. While the available material does not allow for a full discussion of the issue of rationality, it can be thought of as a multifaceted phenomenon, a kind of time culture, which is evident in contemporary daily life. Here I can only refer the reader to Adam and colleagues (1997), who offer an interesting perspective on the "*speeding up of social life and economic processes*" (Adam *et al* 1997:74) in contemporary industrial societies; and to Edmonson (2000), who discusses findings relating to time-regimes from studies of rural farming settings in Western Ireland. Again, I would suggest approaching the issue from the perspective of everyday mobilities. A value tends

to be attached to effortless, easy and rational routines for daily activities. The act of choosing a short cut provides a simple example for considering the argument further: we can see that giving one's path a straighter shape is an often-rehearsed and rewarding pedestrian solution; paths find their ways outside the course prescribed by footpaths, indicating that people like to pick short cuts. I would suggest that the way farmers refer to rationality expresses at least partially a similar urge to shorten the duration of (doing) things. While this certainly is motivated by time-economic balancing and economic concerns (which are of fundamental importance on farms), the wider context of contemporary farming is the modern world with its accelerating speeds of mobilities and fast Internet accesses. In this world agriculture can only join in with difficulty, due to its "*dependence on the rhythmicity of nature*" (Adam *et al* 1997:76); and due to the fact that tilling work does not reach the kinds of speed characterising other activities in the modern world (see chapter B2).

C.2 Orientations in Land Use

"We then come to have a 'line', which might mean a specific 'take' on the world, a set of views and viewing points, as well as a route through the contours of the world, which gives our world its own contours. So we follow the lines, and in following them we become committed to 'what' they lead us to as well as 'where' they take us. (…) the longer you proceed on this path the harder it is to go back even in the face of [.] uncertainty. You make an investment in going and the going extends the investment. You keep going out of the hope that you are getting somewhere. When we don't give up, when we persist, (…) we give ourselves over to the line. (…) If we give up on the line that we have given our time to, then we give up more than a line; we give up a certain life we have lived, which can feel like giving up ourselves." (Ahmed 2006:16f.)

The quote above indicates the direction, in which the argumentation in this chapter will be leading; thus, I return to it at the end of the chapter.

The land-cover continuity on the *land use farms* connects according to my interpretation to valued-based processes that halt reforestation of the arable land. Such valuations motivate farmers to seek solutions for continued land management despite small economic returns and/or capacity restrictions. An important aspect that supports the interpretation I detail on below concerning the creation of the values of land is the fact that farms are homes. For the farmers encountered in my study, the continuing to live 'at home' even after withdrawal from active farming must be the most natural thing to do. As a previously quoted farmer stated, the farm is where [one] lives and is happy. The majority of the interviewees grew up on and have inherited their farms from the parental generation (n=17, see Table, Annex II); the other farmers have acquired their farms as adults (n=7), some of them having grown up nearby, others farther away.

Furthermore, I have noted that inheritance is as aspect of important to farmers. The description of the farm as a place going back to the grandfather featured frequently at the beginning of the interviews. The importance of family continuity backwards and forwards in time is similar to that observed by Flemsæter & Setten (2009), who describe strong ties between family and property in a Norwegian study of smallholder farms.

The values referred to by the farmers interviewed in my study in relation to land can be listed as production and livelihood-related values; values of a good living environment and a setting that enables engagement in preferred enjoyed activities (it could be cattle breeding, or nature walks); values of the place one knows well; values originating in the farms being homes connecting to personal history and/or to family history; values of the land as inheritance, placing oneself as the manager of a landed property and of the agricultural landscape in responsibility for those values. The land seems suffused with significance that remains embedded in the forms and colours of the vegetation and the soil; the valuation of what is perceived in the land orients land use actions that then come to follow the end of keeping those values intact for as long, and as far as possible by managing them as proficiently as possible. In this context, it is useful to remember that open arable land represents a purified state that does not last without active intervention, and that the process of forest regrowth sets in if a field is not regularly tilled.

The valued openness cannot be isolated from the forest, the nature, or the totality of the landscape in an experience-based sense of place. However, at the same time, the totality would not be what it is without the open land(scape), which is surfacing in the farmer interviews as the land cover type under threat, as I have discussed. While arable land constitutes a resource in farm livelihood projects on some of the farms studied, on far more farms the openness of land represents a value as part of the living environment, providing light, pleasurable vistas and enjoyable milieus. In fact, on farms where open land surrounds the farmstead, the farmer family can be said to be living on the site of accomplished and sustained clearing. Furthermore, for farmers the land is enmeshed with memories of happenings and experiences, and they emphasise the importance of keeping it open (planning for afforestation is reported as painful, difficult). Related to this Flemsæter & Setten (2009) point at the importance of materialized properties related to landed property, inheritance and the values that go therewith.

I interpret the presence of a variety of values perceived as embedded in the open arable land as contained in a changeable state, a kind of fluid mix. What comes to the fore when is shifting. The openness of land is consequently about varyingly distributed, often intertwined, values of investment, inheritance and identity (in order to rehearse three codes I used during the analytical reworking of the empirical material, see Methodology). Then how does this relation to the land form? In my understanding, this evolving process can be described in the following way. By employing observant engagement, the individual connects to the setting in which farming is enacted and orients her/himself towards the goal-situation of the *farm project*. From the farmer perspective, previous (inter)actions, the doings of yesterday and yesteryear, remain in/on the land such that what is carried out today connects to and aligns with (or conflicts with) what has been done earlier. Because of this, the farmer and the place are tied together, I would suggest, in line with Setten (2002) and Arnberg (2007).

To be in the right place at the right time is crucial for success in farming, as the discussion of the tilling work shows. This can be characterized as an example situation describing the now line[99] of the *farm project*. At the same

[99] "*For as a person incessantly pushes ahead in time-space along the tip of an always advancing* now line*, where becoming is transformed into passing away, she is at the center of a repeated dialectical interplay between her corporeal actions and her*

time, the open land derives its vitality from values perceived in the openness which function like roots, created and carried by an orientation that extends beyond the now line. These roots are sustained, I would suggest, by the strength of the ties the farmer experiences to the land and the farm. Once such ties have started to form, they endure through times of disorientation and new orientation, ensuring stability of land cover in the case of arable land described here. Orientation calls for a continuation rather than an interruption of the previous line of action; identity grows from commitment to a line/practice (Ahmed 2006; Arnberg 2007). The *farmer landscape* represents a kind of individually formed valuation of investments continuously made in the place (that the farm is experienced to be). I visualize the thus oriented landscape, which the farmer finds around her/himself when relating to the farm by using two continua: the farm/land continuum and the family/generations continuum (Fig. 55). I have circumscribed this 'situation on the move' by these two continua, intersected, or rather moved along, by the line of investment / commitment followed (where investment reads in a broad inclusive sense as anything perceived of as put-down in the land). The first continuum farm–land deals with the farm representing the place of living; the land with its features connects to this platial aspect, but is mainly about its being an asset in arable production. The second continuum combines the family and the inter-generational aspect. The family represents inheritance values connected to both the farm and the land, whereas the land also can be experienced carrying inter-generational values by 'anybody' interacting with it, not only by those who are direct heirs of a piece of land. (I return to discuss the latter aspect in the section More than a Private Landholder Issue).

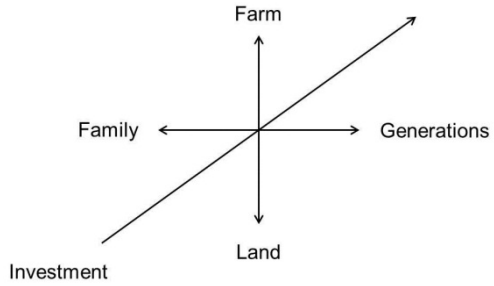

Figure 55. Continua in the Farmer Landscape

In my interpretation, the continuing along the inherited line by re-enacting previous investments, promises two kinds of returns: sustained productivity of land, and a reinforcement of one's identity. Actions that conform to this continuation line appear meaningful even if there is no arable production. One comes to have "*a route through the contours of the world, which gives [one's] world its own contours*" (Ahmed 2006:17). I interpret this as a situation of being oriented in oneself, which occurs at the same time as the being oriented in (the) place occurs. Both Ahmed (2006) and Hägerstrand (2009) describe how such a sense of oneself and one's place – which can be seen as the source of knowing who you are and where you are – takes time to build up. In the state of being-at-home, "*one can easily mobilize ideas about what exists where*" (Hägerstrand 2009:42), and, as the farmer accounts suggest, the particular setting of the farm turns into a place perceived as embedded with values.

mental activities and intentions, between what she physically does and what she is able to know and think." (Pred 1981:11, emphasis added).

Split and New Orientation in the Farm Project

Discussing orientation and, especially, commitment as ideas when relating to land-use decision-making makes it sound like proposing a stable advancing towards an envisioned goal already in sight. Carrying through with the *farm project* also entails finding one's way; another way to express this would be to say that the line that is followed is also created by following it. During the twenty-year period covered here, changes have occurred on the farms studied, despite of which the arable land is stubbornly 'kept open', if necessary by searching for ways other than engagement in farming for a living. My interpretation of the farmers' descriptions of these situations is that the disaggregation of home and livelihood produces a tension vis-à-vis the original and commitment to farming for a living. While the logic of doing entails a striving for time-economic rationality, the logic of place, the being at home, entails an experience of and a striving for stability. In the disaggregated situation, this is observable as applying to the core area of the farm estate, which is kept open. Such a situation, with its demand for creative solutions, pertains especially in the case of smaller-scale farms, which have been faced with poor viability during the last decade or so.[100] Here, the disaggregation tendency appears tenser compared to farms with older owners. Where the former is the case, the *farm project* can be described as splitting up from an integrated situation where farming is a livelihood and land management a matter of course, and moving into a divided situation with non-farming income and the land being managed for the sake of sustaining its openness. I have observed cases where the prospect of gaining a living from farming had been assessed as poor at take-over from the farming parents, and cases where this insight developed along the way as the returns from farm produce got poorer and more insecure. The farm then morphs into a place where one lives, from having been a place of engagement with the land. Non-farming income in many cases goes together with time being invested outside the farm/farming, which has timespatial consequences; there is correspondingly less time left to invest in the farm. Although I present the 'doing' and the 'being' as two somewhat separate kinds of logic, in farming practice they can be seen to merge.

The breaking of the commitment to farming demands new orientation and a re-shaping of the *farm project*. I have taken the farmers' accounts to mean that the disintegrated solution of finding somebody else to cultivate the land, while themselves commuting to employment elsewhere feels artificial. The interviewees describe phases of crisis, painful coming to insight, doubts and ponderings (see chapter B5). Obviously, the modification of the previous line of action is about finding a 'new' identity, a process during which one shapes a new line to follow, to follow Ahmed (2006). Some farmers explained that they – after a while – had come to terms with having finished farming; the situation had started to feel good. This needs to be contrasted against the previous situation, in which farming was described as insecure, unsatisfactory, and increasingly burdensome, due to factors such as transports not showing up or poor farm gate prices.

The example with the farmer couple and their summer grazing (see chapter B2) provides an example of the split-up occurring at a time when it was natural for the farmer couple to wind down their activities and step aside due to old

[100] Especially the farms LUF 11, LUF 23, LUF 17, LUF 15, LUF 22, LUF 14, LUF 18.

age. They were not pushed into it by farm-external developments hampering farm-based income. The couple also stated that "*it has gone well*" (farmer interview). During the couple's active period the farm remained a smallholding with a diverse stock of farm animals; in the later stages more emphasis was on cattle, while the cropping was throughout mainly aimed at fodder production. The farm domain demonstrates a high degree of stability over time. The timespatial shapes of the farming activities on the farm presumably remained similar from year to year, and they sufficed to provide a living. Farm stability can be interpreted here as a provider of security and a foundation for maximal ease with regard to carrying out the everyday farming business on a smallholding.

The notion of the *farm project* can, based on the discussion here, be more specifically described as a commitment to the farm that brings forth orientation but is also capable of flexibility and re-orientation, which are clearly demanded if continuation is to be ensured. Hägerstrand (2009:206) writes: "*Abrupt jumps outside time to shift one's position in space are impossible*" as I have translated his words. In fact, the farmer cannot jump with the farm somewhere else to places governed by other conditions than present. Therefore, flexibility is a kind of basic answer to the demands of materiality and corporeality, but also to socio-spacially transmitted demands.

More than a Private Landholder Issue

Farmers have related experiences with land that resemble inheritance-like situations, but extend outside the farmers' own family to include previous land managers. One example of this is the farmer couple, who explain that they feel indebted to the previous farm owner for the gains they have made from forest felling, as he planted the trees; they also motivate their decision to replant spruce as a responsibility toward "*those who'll come after us*" (farmer interview). I take this to manifest an aligning themselves in a line of land management that extends beyond the individual biography and the family's place (their farm was not inherited from the parental generation; the husband grew up on another farm in the region). One of the interviewees on *clearance farms* described an event that was specific to her, and comprised an encounter with previous efforts put into the (clearing of) land. First – while doing clearing work – she came across what she interpreted as fieldstones removed from fields, as well as other indications of previous cultivation in various parts of the newly purchased land: "*You can see their attempts [to cultivate the land]*" (farmer interview). These 'they' were not her direct ancestors in a narrow sense, as the story is about purchased land. Then something else happened. She told me that "*it got thrilling [and awakening] when [her husband] broke a borrowed implement on a [submerged] stone while clearing*" (farmer interview). More or less suddenly, clearing was not just like any tilling activity, but as I interpret her story the current clearance project came into alignment with earlier projects (failed or interrupted) of clearing land for arable use as one in line. In this way, land and place seem to contain practice-memories (a term used by Schatzki 2010a), the farm land thus represents a stretch of landscape with an incorporated temporal dimension that reaches beyond the individual ownership and farm management to involve predecessors of any kin. Aligning oneself in a line from past to future generations also helps to sustain farming practices. Taking this further, in the context of this study it is fair to say that all of the open land represents a reliable witness of the work that has gone into the land.

Clearings especially might provide a clearer demonstration of the lining-up of current and previous projects along a shared line of commitment, as they demand breaking the course of things. I would suggest that farmers in these situations more or less consciously engage in producing a goal-situation that they come to perceive as targeted by previous land managers – namely, making land arable. Other examples contained in the material are the clearing of land already cleared twice by previous generations on farm (the farm CF 3; see p.112), and the resumed clearance project on farm originally started by the grandfather (the farm CF 7; see p.135). In these cases, the alignment is also enacted in the family, such that the knowledge about the preceding clearance project most likely has been carried orally through the family. In the first case, this connection is created out in the field amidst tilling activities. Hereby the land becomes a counterpart, and an actor in itself, as Setten (2004) indicates in her discussion of the re-enacting of farming practice. For the individual farmer, farming practice represents a given, according to Arnberg (2007:65-68), something that is already there when the farmer enters the field as a newcomer. Today's actions are linked to others' actions today and previously:

"Through the continuance of agricultural techniques (…), people related their actions to the acts of others. They linked themselves to a chain of action and to the history of society." (Arnberg 2007:251f.)

Land is thereby re-invested in through renewed engagement in land management, becoming a part of the relations between people, as Arnberg (2007) concludes. Here I would suggest adding the link to the land as being suffused with embedded meanings. The production and re-production of particular material arable fields appears linked to a perception of embedded values in the concrete materiality of the arable field. The tangible features of landscapes provide the material basis for a symbolic content to adhere to, namely what is termed cultural values by Stephenson (2005, 2008). As I see it, values perceived in open land 'start to embed' as a person engages with the land, not only via concrete tilling activities, but also by carrying responsibility for a farm and land as rural landed property. This may open-up for comprehending a deeper dimension in them; this is what Stephenson (2008:136) circumscribes as 'awareness' of past on-goings and their traces in the landscape that facilitates the creation of embedded values. This contrasts to her to "*[s]urface values that are the perceptual response to the directly perceived [landscape] forms, relationships and practices [present in the landscape]*" (Stephenson 2008:136). The farm with its lands in this way becomes a place that is taken care of due to ties forming between the farmer and the land. In a similar vein, Arnberg (2007) suggests that engagement leads to a relationship arising between farmer and land:

"By investing physical effort at a locale, a relation is created between the person and this locale. (…) Via the work on the land, land and farmer are woven together; without work inputs this web will disintegrate." (Arnberg 2007:67, my translation).

Arable land as a more than a private matter displays other aspects, too, in the empirical material: Arable land was in an earlier quote described as an asset that fits poorly with contemporary norms of private property and landed capital:. The quoted farmer indicates that the value of land arises from active farming, not from visiting the farm once a year for moose hunting, as this farmer went on to describe the situation in her home village. Another farmer quoted above criticises his neighbours for letting the land lie, while yet another notes that retired farmers carry on living on their farms 'too long',

instead of giving the younger generation (possibly farm heirs) the chance to take over before getting settled with their families elsewhere. Many opinions were expressed to me; I take them to indicate a perception of the importance of land management as continued re-enactment of the status of the arable land. It is important to remember that arable land loses its potential as farming space when it starts to regrow with bushes. It's being an asset in the future depends on it being maintained today and tomorrow. Therefore, the farmer who plans withdrawal also plans to buy a proper shredder to maintain the land, that is to say, to conserve its status. Connecting to the previous discussion in this chapter, I would suggest that the influentiality of what has gone into the land could be taken to mean an investment, by which the land receives a pre-disposition for some particular thing rather than something else. Open land, as and when it is perceived as an investment inherited from generation to generation or landholder to landholder, challenges the farmer to find ways to keep it open. When looked at this way it seems that land management can entail adherence to 'inherited' farming practice (on the other side of the coin here would be the time demand discussed in the previous chapter). I argue that the farmers who keep their lands open make this decision on the grounds of the intertwined paths of identity formation and place formation. The farmers *understand* the qualities that the land displays: they are not slavishly following orders from those who went before. Importantly, embedded values can come to be perceived without long engagement 'on the spot'. My study documents a variety of lengths of engagement with the land, one example being the retired couple who purchased their farm five years prior to the interview occasion, and expressed that it did not feel right to plan for afforestation of a meadow (discussed in chapter B4, p. 96). Gunnarsdotter (2005), too, has observed strong emotional relations to landscape describable as place-identity, a sense of place, both in persons with family bonds to her study area and in 'newcomers'.

The ways in which the farmers interviewed relate to the openness of land appear shared when it comes to their doings: they all choose hay and keeping some cattle or leasing-out the land above reforestation to keep the fields open. Some of them explicitly provide expression for a shared valuation of the land, i.e. a kind of customary relationship to the openness of land in their region. They also refer to subsidies available for arable land, however only few farmers did so (I return to discuss the subsidization in more depth below).

To me, the meaningfulness of land-use decisions hinges on the issue of identity and the complexity of the values and functions land thus gains. In part, these are shared with other landholders in the region, which points in the direction of understanding the area as a *landscape* in a substantive sense, articulating customary relationships to the land.

Reflections on the Interpretations Presented

The *land use farm* study has been asking about the farmers' relationship to their lands and farms; it has covered the land-cover types on the farm and asked about the meaning of the farm for the landholder. I assume here a link between meaningfulness and land management thus that the farm project (the meaningful goal with having the farm) carries the empirically indicated land-cover continuity of arable fields. Arable land only gradually during the research work gained its focal position in the study, as pointed

out in the chapter on Research Approach. This was due to my understanding of it representing an active intervention and a specific value to the landholders. Therefore, the discussion above has been centred on the question why the open land persists by deepening the understanding of its valuation. I have suggested that meaning appears – to the landholder – embedded in the land; and that concepts such as investment, identity, inheritance can circumscribe this situation, on which I believe the relationship of the interviewees to their lands is founded. This value-laden situation leads to statements such as one "*just do[esn't] close down the land by covering it with spruce*" (farmer interview), i.e. there appears normativity. Linking to this more social aspect, one may connect the empirical results presented by Nilsson (2010) that the presence of open lands, especially meadows and semi-natural pastures, in a radius of 500m from a landed property in a rural area was associated with a higher property prices (2,6%); thus indicating that especially the mosaic character in a landscape is valued in Sweden.

Alongside with this line of argumentation I have presented concerning the valuation of the openness of land we need to raise two concerns that may narrow the scope of the interpretation posed. These concerns consider the option of capitalizing on letting the land lie – an option that since recently is available to farmers (subsidization decoupled from production) and the possibility that afforestation appears to landholders an act that needs permission from the authorities. These complementory explanations concerning the phenomenon of land-cover continuity can be thought of. Firstly, the issue of agricultural subsidies included in the Common Agricultural Policy of the European Union, especially with reference to the decoupling of arable production and land management from 2005 onwards. Landholders on the *clearance farms* criticise their neighbours for 'passive' management, pointing at the farm payments schemes; indeed, included among the *land use farms* there are several farmers who are likely to fit in this category although such critique was not voiced in the *land use farm* study. Land management has become less intensive on several farms such that the land is kept open by minimal tilling measures. In addition, several landholders reported that they 'kept the subsidy' when another farmer *de facto* was doing the tilling work on the land. This of course gives yearly income, the size of which depends on the acreage on the farm. The ambition to sustain the land-cover status may thus resonate with the economic incentive represented by agricultural payments, especially since the area-based single farm payments were enforced in Sweden in 2005. A systematic examination of the influence of agricultural subsidies on land-use decisions has been outside the scope of this study as this would need to include the farm economy as a whole and consider the variety of payment schemes that have been in force between 1990 and 2010.

My interpretations build on what the farmers related as aspects importance by themselves; however my interest in the farm-centred (farm-internal) processes may have worked to excert an unarticulated influence on the interviewees, or they might have taken for granted that I was well informed over the subsidization of their farms. I have posed direct question concerning the kinds of subsidy received to the farmers on the farms LUF 21 and LUF 23. The farmer on the farm LUF 23, depending on farming for his living, detailed that the share of the subsidies from the farm income was 20-25 %; he frequently mentioned that the subsidy was important for his ability to keep grazing animals on the less fertile, often semi-natural pastures. Additional Farmers who on their own initiative referred to

the farm payments were in the main the retired farmer on the farm LUF 5, who expressed intertwined motives for continuing with farming and stressed frequently the importance of subsidies, which also created the necessity for him to repair the damage caused by wild boars. Other farmers referred to agricultural subsidies in passing as a current matter of fact, but insecure in future. Yet other farmers reported on excluding land from the payment scheme due to their want to resist regulations concerning the amount of trees on pasture, or due to wild boar damage. This means that there are limits how far farmers feel they want or can go while applying for farm payments. The two statements dealing with subsidization presented to the participating farmers during the 'study circle' were 'hayfields receive the subsidy' and 'the area-based subsidy gives cash regardsless of crop'. Both statements were deemed as fully relevant in all (individual and group) answers, with slight disagreement concerning the second one.

The role of subsidization for observed transformations of arable land to permanent grassland was found to be very little in two Danish case studies (during 1990-1995 and 1991-1996 respectively, based on structured personal farmer interviews) by Kristensen (2003) who notes that the reluctance of farmers to subsidized conversion arable land to permanent grassland may be influenced by management requirements coupled to subsidized grassland. Currently, concerning the case of grassland, the area under subsidized management is declining in Sweden (Antonson & Larsson 2011). Importantly, subsidies decoupled from production exist only since 2005 in Sweden, as mentioned, whereas the study documents a stable land-cover situation since 1990, thus a clearly longer period than 2005–2010. During 1990–2005, the agricultural policy was not stable (Antonson & Larsson 2011). Today's situation may however be on top of the farmers' minds. Farmers also referred to the five-year structure of the contracts connected to the farm payments, which would not allow for any changes, one would need to adjust land management to these obligations.

The county official Umeflod, describing the rise and fall in the number of new applicants in 2005 and afterwards, offered as explanation that the new applicants from 2005 had come to insight on what it takes to engage in farming (Umeflod, pers. comm.; for Skåne the same rise and fall was described by Trellman, pers. comm., see chapter A3). Nevertheless, the decoupled farm payments are taken to be supportive of continued engagement in land management (Lingegård 2005, who talks from the position of Northern Sweden). It remains to show whether subsidies could explain land-cover continuity in situations such as those studied. In such case, in the situational map presented earlier to sum-up the findings (Fig. 16, chapter B5) one might add a dashed-lined arrow from 'Area aid & other subsidies in CAP' to 'Maintaining the open land' figuring as a centerpiece on the map. The interpretation I make of land management as supported by a bundle of intertwining motives may very well contain the economic incentive by subsidies, *if* what is offered is in line with the ambition of the farmer. It appears plausible to me that farmer motivation represents an essential factor in determining land-cover status on managed land.

Secondly, the possibility that farmers believe they 'must' manage the land, i.e. that they are legally obliged to arable land management can have influenced the land-cover continuity observed. This has to do with the administrative procedure connected to land-use conversion and the management obligations concerning arable land. Amongst farmers the belief that I encountered in one farmer interview may be

more widespread, namely that an approval for afforestation of arable land would be "*troublesome to acquire*" (farmer interview). This farmer described that to her mind forest plantation on arable land would require permission and "*good arguments*" (farmer interview) to convince the authorities. On two other *land use farms* the farmers told me that they had contacted the authorities with their afforestation plans (these were discussed in chapter B4). The repeated inquiries I have made indicate that afforestation of arable land is a matter of sending in a notification; even if the county administration were to find that the proposed afforestation placed natural or cultural values at risk, there are no applicable tools to stop afforestation at their disposal (*SJVFS 2006:17*; Gunnarsson, interview; Johansson, pers. comm.). In addition, passive afforestation observed on aerial photographs is not followed up by the authorities (Johansson, pers. comm.; Helgesson, pers. comm.). I have not systematically touched upon this topic in the interviews as its possible relevance only successively emerged while I worked myself towards the farmer perspective.

Today, management obligations concerning arable land exist according to the land use class of the land, i.e. whether it is used for crops or pasture; these obligations are solely tied to the agricultural payment scheme (see chapter A3). The change in the legal framework in 1990/91 that removed the general obligation to manage arable land from the national legislation in Sweden was enacted at the beginning of the period covered by my study. The farmers interviewed had thus lived since two decades in a situation, in which statutory management requirements concerning pasture and cropland have only applied in connection with eligibility for farm payments; otherwise, if not applying for support payments, from the legal perspective, landholders have free hands in the management of their arable land.

These complementary factors can co-motivate the persistent openness documented by my study. The suggestion I make is that continued maintenance of arable land expresses a distinct kind of path-dependency or tradition-oriented attitude, which contains several strands of motives. Such motives relate to the valued openness of the land, representing a previous accomplishment that should be honoured by maintaining the openness, and appear supported by the enactment of specific land management regulations with the accompanying subsidization of arable land. Thus, these motives do in part relate to perceptions of other actors' expectations (authorities, but also family members and neighbours expressing an interest in how the land is taken care of). At the background, the regional landscape structure itself may play in on the *land use farms* as these farms locate in a relatively forested region: Only one fifth of the the parish territory is arable land[101] (16.7% of the total land area arable land was managed by an agricultural enterprise in 2009; the total area arable land will be slightly higher and produce a slightly larger share of the total land area as not all of the arable land is included in the statistics). There are large forested areas that the farmers often referred to as the 'big forests' – to afforest land in such a situation may appear out of place. This is also a clear difference compared to the otherwise closely related Danish studies (Kristensen *et al* 2001; Kristensen *et al* 2004; Primdahl & Kristensen 2011).[102] While the Danish landscape is not counted as boreal and

[101] Due to concerns of anonymity, I restrain from producing a map of the area.

[102] Other differences between Denmark and Sweden exist, too, such as differences in land-use zoning.

lack the influence of the northern coniferous forests on the landscape, in the case of the *land use farms* forest re-growth is experienced as on-going and as something that has to be kept back actively.

From an economic and an existential point of view the found sustenance of openness can be perceived as 'unexpected' in the constrained farming situations on the *land use farms*. The fact that the open land is valued in multiple ways might also mean that in future other interconnections of values produce other or similar 'unexpected' land-cover effects. As the farm example with grazing services indicates, one value may give over to another value on when the situation changes, with land-cover continuity as result. In future, we therefore might see other, similarly 'unexpected' land-cover effects of farm-based processes. The farm example with the forest replantation farther away vs. the forest replacement at sight from the farmhouse shows, moreover, that the values the farmer goes through with depend on the location on the farm; such a 'what-fits-where' principle is important both temporally and spatially. I maintain that since land is perceived by the farmers to hold values (plural!) and since this occurs in a dynamic reality, it is obviously less promising to attempt to pin-down a single specified value's effect on a specific outcome. This is so as the situation is changeable, and such results would therefore have limited validity. What I therefore have attempted has been to interpret the findings concerning the *farm projects*, and the land, from a generic point of view regarding the creation of such 'embedded values', rather than adding to the list of 'drivers of land use change'. The concept of embedded values suggests that the valuation of a place has to do with awareness of past qualities (Stephenson 2008, see previous section). In order to shortly explain what I mean with the expression 'drivers of land use change' that I used above: A branch of land use studies can be referred to as taxonomic studies that attempt to reduce and mediate the complexity of reality by categorization under the label 'driving forces' or 'drivers' of land use change. According to this perception, the individual land manager is driven in his/her land-use decision-making by such various forces. Schneeberger and colleagues (2007:350) classify the driving forces of landscape change in the five types: cultural, economic, technological, political, and natural/structural, following previous classifications by Bürgi and colleagues (2004), and Brandt and colleagues (1999). The driving forces can be located on different scale levels between the society, the single farm, and the farmer, Schneeberger and colleagues (2007) suggest. Behind the labels, in fact, a multitude of various factors can be listed. Schneeberger and colleagues (2007:350) list attitudes, beliefs, values, and traditions, but also "*ruling paradigms, zeitgeist*" (p. 354), as well as living standard and demography (cultural driving forces); prices and terms of trade (economic driving forces); irrigation techniques and motorization (technological driving forces); laws, subsides, and decisions on land use (political driving forces); and finally, the topography, soils and climate, but also "*rural road constructing*" (p.354) as well as the spatial structure (natural/structural driving forces). Rounsevell and colleagues (2006:59) offer the factors agricultural world supply and demand, market intervention (through agricultural policy), rural development policy, environmental policy, EU enlargement, resource competition (e.g. urbanisation and bioenergy crops), the role of the World Trade Organisation, and climate change through its effect on agricultural productivity as drivers of agricultural land use change. Lundén (1977:9) brings in another set of factors influencing land-

use decisions: physical properties, technology, territorial economy, ideology, land-use interests and power, political and spatial organization respectively. To me it occurs that the classificatory approach introduces descriptive complexity into the issue of land use change without necessarily being able to explain the goings-on on ground. This type of approach confers to description, and labelling, explanatory power (cf. Cloke *et al* 2004). Futhermore, it depends more on the focal interest of the study which kinds of drivers are considered as these are often pre-defined.

The finding of the importance of temporal and spatial aspects in farming practice discussed in this thesis has to do with the choice of the farm as a unit of analysis and is directed towards understanding the farm totality as an entity that 'filters' land use decisions (I adhere to Hägerstrand 2000 here). The interpretation of the observed land-cover continuity and of what I have encountered as a kind of path-dependency on the farms studied has been investigated by opening-up the farmers' engagement with the land as a situated activity. Engagement in farming and farm management bear as human activities a temporal dimension: To me it appears reasonable in the light of the farm studies to think of farming activities as oriented between motivations perceived as past and ends perceived as future (expressed in the concept of *activity timespace*, Schatzki 2010a). This intrinsic dimensionality of the farmers' land use activities can therefore be understood as receiving orientation from that what is past and that what is anticipated. I see this as linking over to the idea of following a line, to which one feels committed and from which one hopes to gain returns (Ahmed 2006, 2010). I end with reference to the quote in the beginning of this chapter, an elaboration by Ahmed (2006) concerning the following a line as also entailing that one's life gets tied-up with the line followed. In this study, I see this happening between the farmer and the land such that farmer-valuations are anchored in the land, i.e. perceived in the land, and that this kind of value-transmission may continue over generations. The farm land is managed in seeking to maintain, or even to enforce, the values thus perceived in the land; to effect land-cover continuity.

C.3 Land-Cover Change in the Rural Landscape

This final chapter focuses on the landscape dimension of the farm-based land cover processes identified on the farms studied. As boreal lands have a tendency towards forest (re)growth, arable land stands for a holding back of forest. The persistent openness of arable land and forest clearance for arable use are both farm-based processes that disregard the options of field afforestation or forest renewal, respectively. The interpretation of the farm backgrounds of these processes was discussed in the previous two chapters of Part C. In this chapter, I investigate the implications of the farm-based findings for rural landscape change by reading persistent openness of arable land and forest clearance for arable use from the point of view of their surroundings, as displayed in the cases studied.

Landscape Change and Farmer Practices

The looks of a landscape are upheld, as discussed, by land use activities. In this section, I clarify how landscape change and farming practices interact. I look at this issue from the

perspective of a single field, a farm and a landscape in which the parcel and the farm are situated. On parcel level, an act of land cover change such as forest clearance for arable use is total. I reminded myself of this in field without having seen the transformation happening:

Field memo, Aug 2011: Land clearance is something tangible, and a happening: a moment ago this was forest, now an open field.

At farm level, such land cover change is partial: the acreage of the original land cover type decreases and the new land cover type increases. Correspondingly, the overall balance of land use classes on the farm estate and the farm domain shifts. Finally, in the landscape where the land subjected to change is located, the effect will be that of 'opening up' or 'closing down' (Fig. 56). Clearing forest for arable use produces a new open field that is incorporated into the landscape; likewise, afforestation of a field closes down the vista. At any given point in time, a farmer who owns forest can choose to clear the land for arable use. The land cover change goes together with a shift from forestry practice to farming practice in order to manage the arable land. Similarly, at any moment a farmer has the choice either to sustain the openness of arable land by engaging in farming practice, or to discontinue and let the land revert to forest[103]. These kinds of choice affect the distribution of arable and forest land in the landscape around the parcel that is subjected to change. The open land area shrinks or extends (Fig. 56, arrows). The land cover changes are accompanied by changes in the farmer's occupation package(s). Land cover change therefore has a time-economic dimension. Arable and (productive) forest as land covers have different time demands.[104] In a similar way to farming activities, forestry practice allows for a variety of time-regimes and imported farm-external time resources. Indeed, the intensity of forest management varies considerably between the *land use farms*. Some farmers actively engage with their forests, while others are simply 'involved' in planning the management of their forests, with the actual enactment being carried out by forestry specialists. A few farmers take their winter firewood from their forests by their own efforts. Forest management generally has a longer rhythm than the management of arable land: newly planted saplings need supervision and other measures; once the young trees are established, the next measures are due about twenty-five years later, then thirty-five years later, and so forth, with 'tree harvest' generally due after seventy to ninety years, or later.

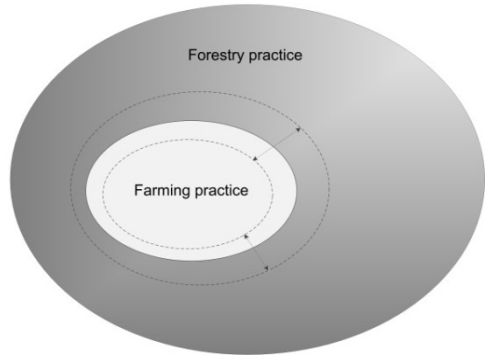

Figure 56. Landscape Change and Farm Practice

Arable land demands input much more often in comparison, having an annual rhythm. In other words, the choice between arable land and forest land is also about choosing between different time demands (and in the case of 'passive'

[103] Arable land is also 'lost' to other developments such as construction.

[104] Here I disregard the fact that forestry and farming additionally require suitable equipment, knowledge, etc.

reforestation, the time demanded by the land is even lower).

Landscape changes therefore appear in conjunction with changes in the farmer's (to be more exact, somebody's) set of occupation packages, and are brought about by such changes. The nested levels on which land cover change can be invested display the phenomenon of land cover change in rather different ways. While the parcel is what is in a material sense transformed, the farm is the unit in which the activities that effect the transformation occur; in other words, the farm is at the background of parcel-level land cover changes. Landscape change therefore consists of discrete temporally and spatially irregular land cover transformations; a fact that does not mean that typicality or patterning of changes is non-existent, rather it means that chosen approaches play a large role in what kind of changes can be recorded.

Socio-Spatial Rural Landscape

The rural landscape is made up of a composite of land covers and farm domains[105], and can be described as a socio-spatial phenomenon; a schematic illustration clarifies this (Fig. 57). The landscape in this simplified model consists of a stretch of open arable land surrounded by forest land on two sides. The most basic, and essential point here is that the three farm domains are not coextensive with the two land cover types displayed in the illustration, around which this study revolves. Landholder A owns land at two locations, mostly forest but also some open land. Similarly, landholder B has land in two places: as can be seen, this is a farmer with quite a lot of arable land and some forest, with one unit of land held separately (perhaps on lease) and only consisting of arable land. Landholder C only manages arable land, which is partially locked in between lands managed by landholder B.

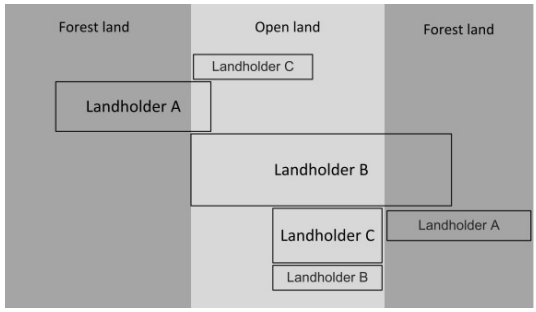

Figure 57. Landscape as a Socio-Spatial Phenomenon

A change in land cover at parcel level on any of these individual farm domains will be of an individual size; such changes will also be enacted with varying frequency. Landholder A might choose to afforest the little arable land area, which would 'close-down' the openness of the stretch of open land; or landholder C might purchase some adjacent forest land from landholder A to clear it for arable use, which would 'open-up' the landscape. If landholder B decided to afforest his larger area of arable land (in the middle of the figure), the landscape change would be more dramatic. The degree of change displayed at landscape level represents an emerging property that can most easily be captured in retrospect, since the current farm domain structure complicates the translation of parcel-level or farm-level land cover changes to landscape changes. The farm domains are often spatially fragmented as management units; they may include both owned land and land managed under various kinds of lease conditions (see chapter B2, section Fragmentation and distances). Therefore, my approach in the rest of the chapter is to elaborate formally on the

[105] Taken strictly the rural landscape is composed of land covers and farm estates. Here I take the step further to consider farm domains, it does however not make any significant difference to the argument here whether 'farm estate' or 'farm domain' is chosen.

locations of land cover changes and farm-based processes in interaction.

Landscape Dimension of Farm-based Land-Cover Processes

Landscape dimension of Persistent Land Management

The findings from the *land use farms* convey a picture of persistent land cover. In this section, I look at the continuity and stability from the landscape perspective. During the research period, new fields have not been cleared nor have existing fields been afforested, but for the few cases reported (see chapter B4). What did happen during the research period was that a considerable number of landholders withdrew from active engagement with their land, due to retirement or a switch to farm-external employment. Such withdrawal from active engagement with the land appears to have no more than a limited impact on the land cover; the land is managed in the same way as before, as one interviewee put it. Conversely, land management is often in the hands of an 'active' farmer as leaseholder.

The effect of the land-cover continuity in farm-level is preservation of the mosaic landscape character. It produces continuity on both farm and landscape level. Beneath the 'surface' of land-cover continuity, the arable fields have moved from one farm domain into another, from the landholders' domain to the leaseholders' domain: The withdrawal from farming is about retiring to the lands of the owned territory, relaxing any existing lease agreements, subsequently letting the farm domain shrink until it is basically co-extensive with the open yard around the farmstead only. According to Stenseke (1997), leasehold arrangements conserve existing land cover, which is what I, too, observed on the *land use farms*. In general, one can expect such conservation of arable use on land held on lease, because afforestation or passive reforestation would violate the lease agreement (where a formal agreement is in place). As previous discussed, the 'keeping open' of the land or the landscape is one of the objectives when land is leased out. This means that, unless it comes under a new lease agreement, the situation for arable land that has been returned to the landholder's management is more insecure than the situation for land that is leased out by a farmer withdrawing from active land management.

While the farmers on the *land use farms* often refer to the openness of arable land as being under threat of reforestation, in retrospect and from an external viewpoint it appears on the contrary to be stable. This connects to the landholders' commitment to preserve the openness of arable fields and to the various solutions conceived such as less intensive modes of haymaking and animal husbandry, as well as the variety of formal and non-farmalized management agreements displayed. I have explained this commitment to continued land management as rooted in the values perceived in the arable land. The stable land cover situation pre-supposes the existence of a specific neighbourhood setting in which a symbiotic co-existence of retiring, thus contracting, and expanding farmers is possible, providing all parties with benefits: the 'keep the landscape open' project is only possible if 'somebody' can take over the management of the land, this 'somebody' being a farmer engaged in agricultural production. The degree of activity naturally varies: the cases encountered in this study, for example, include a farm with a very small herd of cattle (see Fig. 13, Farm Domain A) and a farm with a large herd (see Fig. 11).

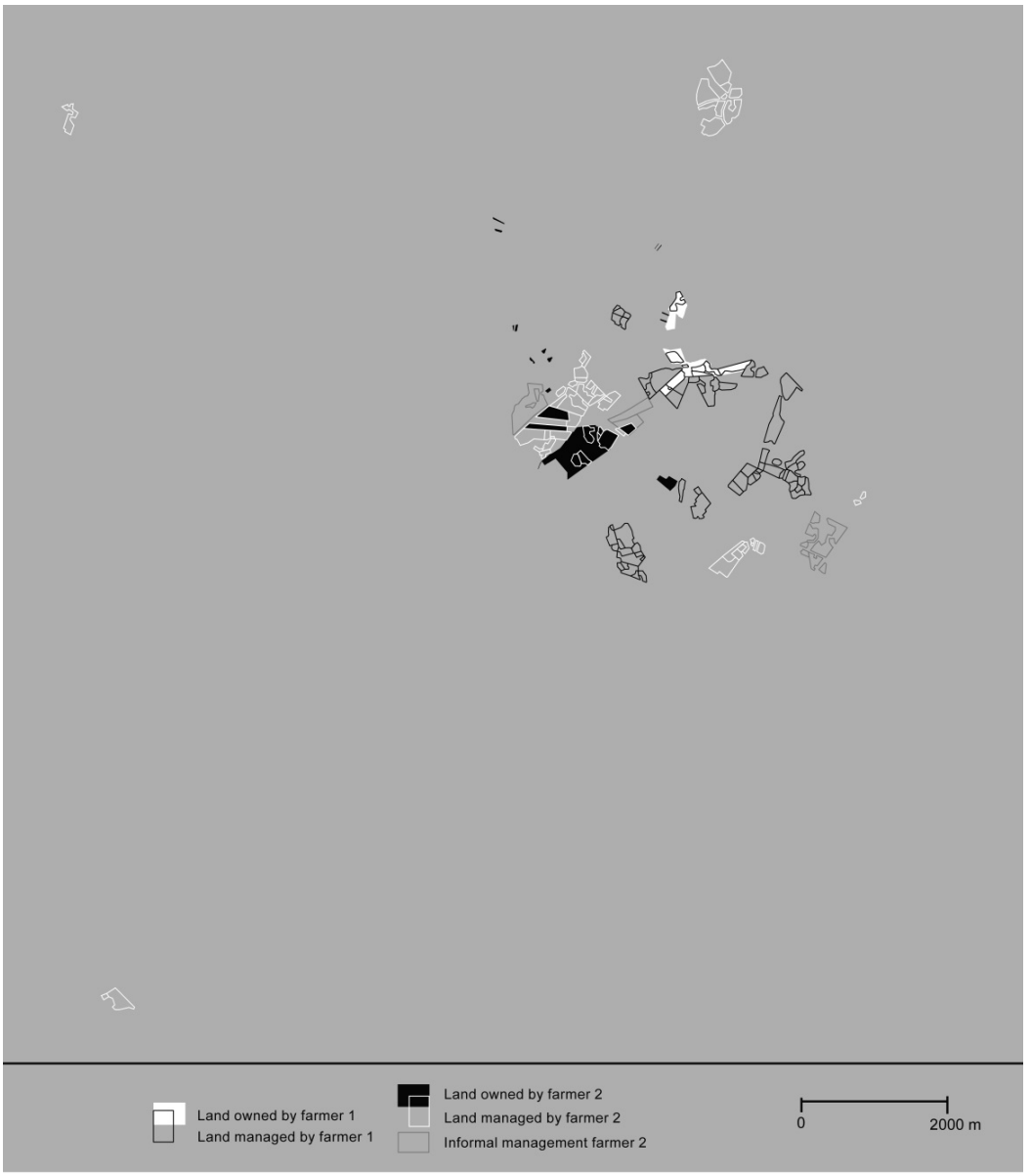

Figure 58. Land Management as a Neighbourhood Process

The farmers running larger agricultural enterprises take care of the open land over a far larger radius than their own land ownership would imply. By way of example, the arable land managed by two larger-scale farmers is shown together mapped according to its factual spatial location (Fig. 58). Together these two farmers manage the fields on twenty-three farm estates including their own; the one of them holds management agreements with fifteen landholders and the other with six other landholders. Many of the agreements concern the management of "*all arable land*" (contract details derived from the farmer interview). Through their land

management these two 'active' farmers contribute to the 'reproduction' of the open landscape, as the example shows, while also assisting the withdrawing landholders' farm projects by keeping the fields under management.

Landscape Dimension of Farm-based Forest Clearance

When land is cleared for arable use, open areas are created or expand. In this section, based on the analysis of the on-farm placing of clearings, I go on to discuss how the clearings affect the distribution of open land in the landscape (for a description of the clearings see Where to Place New Land?). The arable land area expands in the main at the forest/arable land border; in only three of the cases studied this interface is 'created' by a placement of the clearing 'in the forest'; the other clearings are placed adjacent to arable fields, i.e. expand the existing openness of the landscape. The examples given below show the placement of clearings in their surroundings in two types of landscape: a forest-dominated landscape and a semi-open landscape.

In the forest-dominated landscape around the farm CF 9 the clearings expand the arable land area close to the farmstead (Fig. 59, see also Farm Land Map Farm CF 9, Appendix V). These clearings are placed adjacent to arable land. In addition, the southern clearing is placed side-by-side with earlier clearings (accomplished some ten to fifteen years ago), which lie to the south and west (Fig. 46). The current clearance project continues to open up this part of the landscape and to 'gather' the open land more and more in proximity to the farmstead; in the area depicted, arable land belonging to other farm domains provides additional openness together with the openness of a lake. The arable land gained is needed due to a planned increase in livestock that aims at providing farming income to the sons of the family, too. The land cover change expresses a commitment to the cattle project on the farm as a way of earning a living.

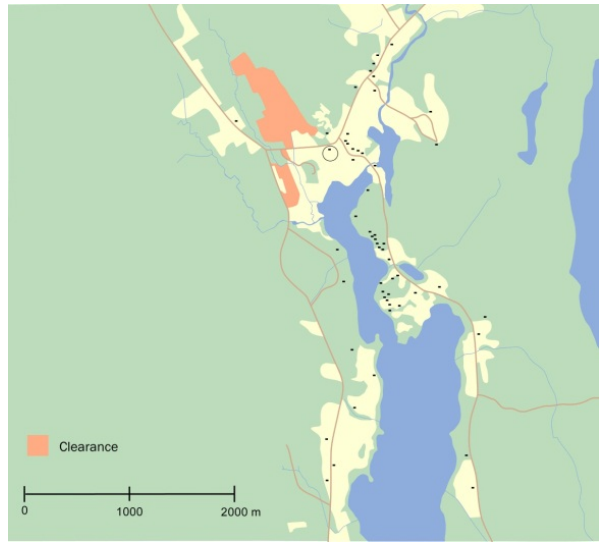

Figure 59. Clearance in a Forested Landscape, Farm CF 9
Symbols used: forest (green), open land (yellow), clearance (orange), water areas (blue), farmstead (encircled), other farm houses (black dots). The map has been generalised to match the scale, but displays correctly the distribution of forest land also towards the west.

In another forested landscape, around the farm CF 1, two recent clearings were undertaken as part of plans to increase the number of dairy cows in order to be able to employ a farm worker, as there is a need for supplementary time input on the farm. These clearings are located in direct adjacency to the farmstead (Fig. 49) and extend the existing open area. The clearings express a commitment to a farm project with cattle; in this, the specified need for more time resources has, at least in part, to do with the getting-older of the farmer couple, according to my interpretation of what was said and of the farm circumstances.

In both cases, the land cover change occurs in connection with, and prior to the implementation of, a planned production increase: the landscape is 'opened-up' in response to plans and hopes for increased

income. This can be compared with the statement of one farmer who said that first one acquires more land, and then one can increase the livestock; this can be seen as a matter of obvious common sense, but it also leads to the interesting landscape effect of things manifesting before the goal that motivates the actions can be reached. In other words, following Hägerstrand (2009), any goal can only be reached when the material configuration of things has reached the goal-situation, to which it corresponds.

On both farms, there is a clearing in the forest, too. The farmer in the first example is considering letting this patch revert to forest. The farmer in the second example answered my question as to whether this field would be afforested by saying, "*Not yet*" (farmer interview), indicating that the field was still useful to him in its open state but that its future might be insecure. The background to my question was that this particular clearance project was originally anticipated to continue onto neighbouring land, this plan was dropped after having accomplished the first clearing as land became available otherwise. My conclusion is that newly cleared land may risk reforestation, if changes occur in its background (the farm situation). I also argue in this study that the inclusion of land into the totality of the farm (project) is crucial. Therefore, newly cleared land also may risk reforestation for as long as the field has not become incorporated into the farm project, that is to say, before its embedded value as an accomplishment, established by continued engagement have started to form.

In the semi-open landscape, a clearing might remove one of the last patches of forest, as is the case in the following two farm examples (Farm Land Map Farm CF 6, Appendix V; Clearance in a Semi-Open Landscape, Farm Example CF 7, Appendix V, p. 220). These clearings are located adjacent to existing arable land, and connect with the neighbouring parcel to form a single field without partitions (Fig. 60).

Figure 60. Arable Plain with Recent Clearing (right) and an Arable field, Farm CF 11

The new arable fields thus generate even wider open spaces. When I visited these sites, at first nothing revealed that one part of the land had been forested until very recently; it was only when I studied the soil more closely that the pieces of root or cut wood indicated recent clearing. Although the clearings are located fairly near the farmsteads, the farmers describe their placement in both cases as having been determined by what can be seen expressing the what-fits-where principle, rather than seeking to shorten distances by concentrating land near the farmstead: "*The forest didn't really do well there*" (farmer interview), "*the soil isn't that good for forest*" (farmer interview). In addition, the clearings are about optimising the tilling movements by reshaping a corner and by creating larger continuous tilling spaces. These clearings express sustained commitment to a farm project directed towards arable production. The opening-up of the landscape that occurs in all these four examples, and in the other clearance projects studied, ensues from the existence of active agricultural enterprises which, though not necessarily large-scale and full-time,

feature farmers actively engaging with the land. Owing to the interaction of time and land use activities, land cover changes may accommodate or deliberately target a reorganisation of the time allocation on the farm, as many of the clearance projects studied suggest. Given that farmers seek to manage the farm domain in such a way that arable land is gathered together and placed as close to the farm centre as possible, this leads from the landscape perspective to an agglomeration of arable land on the farm domain, creating larger areas of openness. Forest land, especially at the forest-arable land interface near the farm centre, can be seen to be instable due to the process leading to the opening-up of such areas.

Landscape Neighbourhoods

The placement of clearings near the farmstead does not mean abandonment of fields farther off, as far as the farmer accounts convey. Such land is either kept under the farmer's own management or offered in exchange as a move of domain management. Only one farmer mentioned termination of a lease agreement as a direct effect of clearance (farm CF 9); another relaxed a lease agreement as one move together with a land exchange and land clearance (farm CF 7). A third farmer (farm CF 10), when explaining the clearings on the farm, referred to the insecurity of lease arrangements; due to the clearing, he would be less dependent on leasing. In the other *clearance farm* interviews, connections of this kind were not mentioned. The case of the farm CF 9 supports the finding by Stenseke (1994) that adding new land to the farm domain may render existing fields peripheral due to alterations in the distribution of managed land, but the others do not. A reason for this difference between findings might lie in differing surrounding situations. Evidence from the farms suggests that the neighbourhood configuration influences land cover processes. Especially when several agricultural enterprises share location in a neighbourhood, land takes on the character of a scarce resource. The farmers interviewed on clearance farms often mentioned land shortage, which they said was in part the result of land being withheld from access due to 'passive' management.

Land cover changes or other moves of domain management can represent a solution to such neighbourhood situation with 'locked lands'. Shortage of land also renders forest land instable in such landscapes. Such landscape neighbourhoods can be characterized as a blend of active and 'passive' farmers. They contain farmer situations and farm projects whose combined effect is that land does not come to circulation (in the sense of being offered for lease or sale). The farmer on the farm CF 4 relates that landholders are reluctant to lease out or sell to neighbours, and consequently many of his farmer colleagues are required to cover large distances to reach fields they hold on lease. This leads the farmers actively engaged in an agricultural enterprise to conduct a "*land reform of their own*" (farmer interview) by exchanging lands with each other in order to reorganize their management units (see also Moving, Placing and Gathering Land). Additional evidence for this kind of constraining neighbourhood configuration comes from the farm CF 2. This farmer describes the farmstead and the fields closest to it as "*locked in between EU farmers who close off all development*" (farmer interview); as a dairy farmer, he is dependent on access to grazing land directly adjacent to the farmstead. This farmer can therefore see no possibility for a production increase in the dairy part of the enterprise in the longer term, for as long as the situation remains unchanged. The farmer describes single fields around his farm domain:

"Yes, the forest has started growing back on that patch, and this part, too, was cultivated before (…). It really all depends on how the various owners look at it [the land]" (farmer interview).

The farmer described in detail the lands around the farm: among the direct neighbours there is a farmer with cattle (thirteen cows) whose only production is fodder for this livestock – yet he manages approximately 90–100 hectares! And several other neighbours 'manage' arable land on which there is no arable production. The clearings on this farm nevertheless testify to the existence of social openings, as more collaborative forest-owning neighbours were willing to sell land. Both farmers (on the farms CF 4, CF 2) stress that land cover processes depend "*mostly on who it is*" (farmer interview), i.e. on who owns and manages the land, given the soil quality is suitable.

This is the only detailed survey of the surrounding landholders' land management in my study but the issue has been brought up by others, too; while I have not investigated such neighbourhood aspects systematically, they do appear to be important from the farmer perspective (see also Moving, Placing, Gathering Land). The fragmentation of farm domains, and the strategies applied in order to move land closer to the farmsteads, suggest that there is not enough land available nearby. In their assessment of the reasons for recent land clearance in Finland, Kivimaa and colleagues (2012) stress that land shortage – one of the main reasons – is experienced locally in conjunction with increasing farm sizes.

Availability of land can in general terms be described as the presence of openings in the farm neighbourhood (in the sense of free space in a thing-structured timespace). Since access to land is regulated by land ownership and lease agreements, such openings are socio-spatial in nature. The findings from the farms studied here suggest that the farm neighbourhoods can be an important factor inhibiting access to land. Neighbourhoods can generate a constraining lack of land to expand on, if there is conflict in the neighbourhood; and if social conflicts remain unresolved, this may hinder future exchanges of land, whether lease or purchase (evidence from one *land use farm*). Where there are helpful relationships in the neighbourhood, on the other hand, farmers can expand, and receive other kinds of support, too (again, evidence from both *clearance farms* and *land use farms*). At a minimum, the process of arranging for access to land appears to me a kind of a social puzzle, for withdrawing and 'active' farmers alike (the farm with summer grazing services, the farm with the tilling sequence, amongst others). Flygare (2011b) describes leasehold as enabling dynamic and change in an overall stable land ownership structure in Sweden.

The two land-cover processes identified might interact in some landscapes to produce the scarcity of land that has been emphasised by farmers on the *clearance farms*. Since, when studying the *clearance farms*, I did not study neighbouring farms whose farmers were in the process of withdrawing/downscaling their involvement (i.e. the farmers described as 'passive' in their land management), I can only speculate that they might view land in ways similar to farmers on the *land use farms*. Their land management, based on values other than production values, then 'clashes' with the spatial intentions of the farmers actively engaging in an agricultural enterprise, their desire to expand. For such enterprises run as a livelihood, increased production is felt to be necessity, dictated by the current neo-liberal regime of open market competition. What looks like having at least the potential for a clash in the symbiotic neighbourhood situation instead takes

on the shape of collaboration. Concerning the land cover consequences of these processes, great variation must be assumed to exist regionally; in the cases studied here, in areas with good conditions for agriculture (the kind of soils mentioned by the farmer quoted above), scarcities might arise; in areas with less favourable conditions for (expansive) agriculture, scarcities are not expressed in such manner. As explained, my perception is that of a symbiosis in the latter case.

The fact that my study indicates the importance of neighbourhood processes to farmers in various ways can be taken as suggesting a critique of individualising research approaches that represent the farmer as 'sovereign' controlling of the farm and is so doing place individual-centred agency on him only, separating-out community, neighbourhood, and even embodiment and the wisdom in doing. My study indicates that farmers engage with land, resources and neighbours in a manner of adjustment, not solely dominance, in order to 'make it (go round)'. Neighbourhood-issues on different scale levels certainly would deserve a study of their own, I would suggest, which also indicates the relevance of the substantive landscape conception in studies on rural land use.

Landscape Dynamics

The findings in this study support the idea that landscape change indeed enters via the forest/arable land – interface, as suggested by Rounsevell and colleagues (2006), who maintain that

"*many land use changes do in practice occur at land use interfaces (…). For example, deforestation occurs at the margins rather than within the centres of forests, and reforestation often occurs as an extension of existing forest land*" (Rounsevell *et al* 2006:63).

The latter suggestion appears in need to be nuanced by stating that reforestation occurs most likely when only little arable land is surrounded by much forest – a description that better fits the recent boreal, and Swedish, situation with many smallholdings having been abandoned often based on former crofts scattered in the landscape etc. (Flygare 2011a; cf. Jansson 2011b). The former case then appear true in the cases studied here, too, expansion of arable land is indicates in the boreal situation a process of concentration which I discuss in this section. The concentration and thus expansion of openness in the landscape suggested as a formal principle here depends on the existence of farms/farmers committed to continued engagement in agriculture. The way farm managers of this kind perceive what-fits-where might also be crucial, in that a clearing here might aim at gains in one corner, a clearing there at reduced wind-felling, etc. Forest areas near vital farm centres can be seen to be instable, especially when neighbourhoods are characterized by a shortage of land in relation to the farm projects present. The findings that clearings on the farms are localised in close relation to existing openness of land, that arable land is often created from forest adjacent to existing fields and that this newly opened-up land is placed near the farmstead, when taken together with the neighbourhood aspect of land shortage, indicate a landscape dynamic that contrasts to reforestation as a dynamic that 'closes down' the landscape. The stability of arable land and the instability of forest at the forest-arable land interface near the farmstead can be understood as time-economically motivated, as can the tendency to afforestation in relative periphery. The stability of arable land near the farmhouse can be understood as being reinforced by the objective of managing the landscape around the farmstead.

Such landscape dynamic entails the increase in and gathering of open arable land in specific landscape neighbourhoods, by which I would suggest geographical areas locatable somewhere between the scale levels of the local and the regional. In such areas, the openness in the landscape is expanding, as a contrast to those areas where the landscape 'closes down'. Similar principles concerning the location of the farms themselves becoming an important determinant for agricultural landscape structure have been reported by Schmit (2006) – a finding that in part builds on the fact that relative (to the farm) parcel location appears important, Schmit provides a highly illuminating summary:

"These results demonstrate that relative space determines agricultural land use. Thus, farm location is a determinant of agricultural land use patterns: the spatial location of the decision maker (farmer) is a variable that explains the land use choice for each agricultural parcel. When analysing agricultural land use from an economic and social perspective, the individual farmer is the unit of observation rather than a parcel." (Schmit 2006:105).

However the results presented by Schmit (2006) concern arable crop choices and grassland location, excluding the forest/arable land interface (the case region in Central Belgium is highly urbanized, and assumably forest areas are under strict protection via land-use zoning). An attempt to identify such expansive, opening-up areas/regions needs to consider the fact that the time-economic savings to be gained on the farm level by the concentration of land near to single farmsteads appeal to a variety of farms as this study shows. Already the small selection of eleven *clearance farms* includes expanding, settled and withdrawing landholders, who all appear committed to engagement with the land and time-economically rational in their (reflections on) land management decisions.

Conclusions and Relevance of the Study

In this study, I have inquired into rural land use in contemporary boreal landscapes; focus has been on farm-based processes associated especially with the management of arable lands of farms. The study is founded on an interpretation of aspects of the relationship between the farmer and the land. The first chapter of this final part of the thesis summarizes the study and presents the findings to which the research questions led. The second chapter contains a discussion of the relevance of the study to the field of landscape research.

Conclusions

The theoretical perspective on land use applied in the study has been that of human corporeality and the materiality of land; I posit that these introduce specific conditions into land use activities. Building on this foundation I have approached land use as farmer activity and arable fields as timespaces, drawing on two different conceptions of *timespace* – one developed by Hägerstrand (mainly 1993, 2009, also previous texts), and the other developed by Schatzki (2010a). The latter conceptualizes activity timespace as solely dealing with human activities, while the former describes the totality of a given landscape as consisting of various populations of things human and non-human governed by constant transformation. In order to understand the relationship between the land and the farmer, and thereby to tie *landscape* to the individual situation on the farm, I have applied the notions of *orientation* and *commitment* presented by Ahmed (2006, 2010). This theoretical framework represents the *farmer landscape* as an active interface. By this I mean that landscape can be thought of as an on-going cycle of establishing (a perspective on) the landscape and the material enactment of landscape (landscape interventions); in this way *landscape* can be seen as a mediator between land-cover processes, and land-use decision-making (in the sense of the planning and carrying out of land use activities).

I have worked with concept development and empirical analysis throughout the research project. The empirical part of the study consists of an exploratory, farm-level inquiry into land-cover-related phenomena and their farm background. The work began with an investigation of farm domains where I assessed all types of land cover over a twenty-year period, including changes in land cover and land use, and discussed land management and farm ownership with the landholders. The major changes reported during 1990–2010 on the first category of farms studied, *land use farms*, are that land management is increasingly in the hands of leaseholders, and that wild boars are wreaking increasing havoc on arable land. In the majority of cases studied, 'living on the farm' is now the main meaning connected to farm ownership, which is made possible by non-farming sources of income such as a farm-based non-farming enterprise, employment in the larger towns of the region, or retirement pension. Hay as the main crop and small herds of cattle provide the

landholders with flexible solutions that help to secure the status of the arable land. The existent land use activities are thus motivated by fodder production and the endeavour to keep the lands open. In a few cases new activities (new crops, branching out into other kinds of business) have been given space on the farms; these and the farmers' reflections on this topic made it plain that new activities may be incorporated provided they fit in with the farmer's overall goals and the timespatial order established on the farm.

After these farm studies, I moved on to study instances of recent forest clearance on farms. Clearance produces owned, well-drained arable land at a cheaper cost compared to the price of buying arable land. Moreover, clearing land can be thought to appear reasonable and economizing from the farmer's point of view due to currently available options of converting stumps and stones into resources elsewhere. In addition, novel implements and powerful machinery make clearing land workable. Clearance projects are geared towards concrete ends such as the enlarging and reshaping of existing fields, better land or soil management, or the reduction of transport distances between fields and the farmstead in order to achieve time and fuel savings. Locational details that lie in the land and the concrete surroundings often determine the placement of a clearing in what can be an expansive farm setting or one where there is an urge to shift the sites of farming activities. The choice of land-to-be-cleared on the farms thus often expresses considerations that connect to the practical tilling work. It is important to note that the placement of a clearing seldom meant the creation of a mosaic type of landscape. Siting a clearing directly adjacent to already-open areas means that the openness of the landscape expands – forest clearance obviously generates an 'opening-up' land-cover dynamic which contrasts with reforestation as a dynamic that 'closes down' the landscape.

In the introduction, I suggested that the practice of land use is guided by a relational element. I have presented interpretations of aspects of this relationship between the farmer and the land that can be found at the background to the farm-based processes of land-cover continuity and land-cover change. First, the importance of time-economy in land use activities – in other words, the urge to organize land management and therefore the farm domain in such a way that time is used effectively and that, if possible or necessary, time savings can be made. Second, the valuation of land as an accomplishment that contains a temporality including past and future and turns arable fields into more than just soil, thus enforcing a kind of path dependency in land management. This process 'protects' the arable land from reforestation, as I argue, also in situations in which farming is not economically viable. Knowledge of how the practice of land use is enacted in relation to a concrete farm situation, and the necessities encountered in practical land use – shaping the logic of farming – is of importance for landscape planning and policy. I return to discuss the need to understand the reality of farming in the following chapter.

The farm studies indicate that both producing and sustaining open arable land take time; I therefore conclude that the ability of farmers to invest time in farming is crucial for land management. New land management solutions are called for when farmers have to reduce their time input into the arable land due to the need to allocate time to other occupations. I have proposed *time-economy* as a relevant concept when considering the layout of farming activities, characterizable as a time-space-rational relationship to land. This concept suggests the extension of the idea of economic rationality by considering time as an essential resource in

farming. The time-economic perspective on the practice of land use explains the importance of time in farming reported by farmers. Time expenditure and the spatial shape of the farm domain directly interlink to produce a situation in which the balancing of incoming (available) and outgoing (used) time is of key importance. Time-economy should not be thought of as relative to the scale of operations, but as relative to the time that is available for their performance (including a negotiable time input from family members, or time bought from contractors). It becomes understandable why farmers are keen on rationalizing the performance of their daily farming tasks, even to the extent of embarking on a rather time-consuming, yet 'one-time' clearance project. Straighter tilling lines, unbroken continuity of tilling movements over enlarged fields and shortened transport distances all relate to farmer time allocation, offering opportunities to save time and furthermore to use time more rationally. Time-economy makes it also understandable why specific land cover types might be preferred, since time expenditure in farm management can be steered by the choice of types of land cover – for example, when withdrawing from agriculture a farmer can shift to permanent grass, or even forest, both of which enable lower time input. In sum, rationality in farming appears to be about *time-economic* considerations rather than solely *economic* considerations.

Furthermore, I have suggested a temporally founded interpretation of the land-cover continuity observed. Here, too, time-economy comes into play – for example where continued engagement in farming is hampered because farmer-time 'must' be allocated to other occupations. Yet, persistence in land management points according to the interpretation I have presented at another kind of temporality: the valuation of land suffused with meanings deriving from the past and the future. Such embedded values perceived in the land (as landed property and the lived-in place) provide management activities on arable land with temporal depth and continuity, I have suggested; a process that produces persistence in land use and implies commitment to a specific line of action in land management, namely the seeking to maintain, or even to enforce, the values perceived in the land. The concrete farm setting, i.e. the land(scape), is widened towards incorporating the past and future as dimensions. By following the committed-to line of action, the landholder seeks to preserve the investments that the (inherited) land represents and carries. Hereby, the landholder re-establishes the own identity via a process in which his or her life becomes tied-up with the line followed. This process, I have argued, lies behind land-cover continuity on arable fields.

The two farm-based processes associated with specific land-cover dynamics, which create and re-create open arable fields, the maintenance of arable land and forest clearance for arable use consist in an active intervention and therefore rely on the ability of the farmer to carry out such an intervention. An interesting difference exists between the two kinds of land use activity concerning arable land described in the thesis. The first producing land-cover continuity is about maintaining, thus re-producing, the arable fields on the farm. The second produces land-cover change by transferring land from one land use to another. The first is about warding off unwanted things, and upholding an existing status. This goal-situation is present 'all the time', and the activities required to meet its demands easily become routinized. This might explain that this type of activities can bind the farmer's time in future – a clearance project can be dropped any time, or rather be let aside for a while, if one chooses so.

Evaluating the landscape dimension of these farm-based processes was the third part of the discussion. Land-cover continuity on single arable fields effects no change in the distribution of forest and arable lands in the landscape. At the 'background' of such a situation exists a 'symbiotic' relationship between lease-providers and leaseholders – symbiotic because both parties can be seen to benefit in their respective farm projects. The mosaic landscape studied is reproduced by this land-cover dynamics; it appears stable in fact due to the complexity and social-temporal nature of the ties between farmer and land. When the opposite is the case: when a neighbourhood contains many 'active' players, i.e. farms, a shortage of arable land that can shift hands may arise. Forest clearance that represents a solution to farmers if land is not otherwise available breaks the continuity of the forest land cover and creates more arable land. Hereby more openness is created in the landscape, especially in proximity to the farm centres. Based on the findings presented in this thesis, I suggest that such an opening-up can represent a principle of landscape development in contemporary boreal landscapes. The situations, in which I have seen such development indicated, concerns places where shortage of land, expansive farms and sustained commitment to farming interact to inspire farmers to clear land – from a technological point of view, clearance no longer represents a particularly arduous challenge. The main finding from this part of the study is that boreal landscapes may contain areas that resist the current trend of reforestation, and are instead characterised by increasing openness of the landscape.

This kind of logic 'develops' the rural landscape, I conclude; the striving for compactly shaped farm domains is according to the discussion in this thesis a process that influences the distribution of open and 'closed' lands in a region. Besides this, the straighter lines and enlarged fields can be interpreted in a similar vein. Domain management is about reorganizing the farm domain in a neighbourhood situation, where access to more land is constrained. Domain management implies a deliberate and on-going engagement in the guise of occasional discrete land deals here and there. It also points at the flexible relationships of spatial intentions and various separate, step-by-step solutions.

I also conclude that contemporary boreal landscapes contain farm-based land-cover processes that, although they may look similar to each other, have differing backgrounds. Land-cover continuity can have at its background a withdrawal from farming, but also an active engagement in farming. A concentration of arable land and the other effects of rationalization of land management – larger fields with straighter borders – may be due to expansion of the agricultural production, hence a need for more land. Such changes can however also result from a scaling-down of farm management, in which case concentration of land brings time savings that are needed when the farmer – in exchange for the engagement in farming – invests time in a farm-external occupation. I further conclude, indicated by the findings of my study, that unexpected land-cover effects may occur (in the future) due to the potential presence of 'latent' values in the land that are actualized in specific situations demanding re-orientation.

The overall conclusion I derive from the study is that spatial qualities attaching to the single patches of land are utilized by farmers in their attempt to enact as good a farming practice as possible in their specific circumstances. The spatial qualities generated by materiality, corporeality and the fixity of land can be described as closeness/distance between fields, and in relation to the farm centre, from where

the tilling operations start and where they end; as corners that hamper ease of cultivation; or as soil properties. Spatialities such as neighbourhood situations reaching from shade to social-spatial situations either enabling or constraining the 'moving' of land closer to the farmstead also belong here. The efforts to utilize such localized properties to smoothen farming practice can be detected by applying a farmer *and* management unit perspective in a study of land use and land cover change. Land management thus harbours a time-space-logic that is in fact processual and dynamic. The linking of such dynamic human decision-making to climate, ecosystem and soil processes remains a next task. Here, I suggest the abstracted generic landscape processes might prove useful.

Relevance to Landscape Research

The main contribution of this thesis is in my understanding the representation of land use as a relationship between the landholder and the farm, or the farmer and the land, throughout the thesis, complemented and necessitated by the focus on the role of materiality and corporeality in land use. I have found that this is a useful way of decribing the link or coupling between humans and the land cover, i.e. for describing land use as human activity. The thesis argues that this way of thinking about land use offers the possibility to link land cover processes and farmer intentions.

The relationship denoted here entails that the landholder (when acting in her/his role as such) can be seen to be directed towards a relational way of acting, taking into account the past and the future of the land under management and the farm as a place extending a site for production. The relationship also entails that farming is carried out in adjustment to own resources and the processes governing farmland, and the spatial shape of the farm, which then can be manipulated in several ways to influence the time demand of the farm. In my attempt to describe the relationship between the farmer and the land, I have drawn on the three-part conceptualisation of *landscape*, and used it as a tool to describe what I see to function as an active interface in the farmer's relationship to land. The stress given to materiality in this thesis places it in line with a recent strand of studies in the field of geography that call for "*re-materialisation of social and cultural geography*" (Everts et al 2011:329, these authors also offer a discussion of this theme that has gained importance in geography recently). Below, the findings of this study are related in more detail to a small selection of previous research.

Time in Land Use

The study presented here complements existing studies on land use and farming by making time, and space, factors of importance. The importance of time enters via the effect of materiality and corporeality on land use; I have embraced this by using the concept of *time-economy*. As such, *time-economy* is relevant to the field of time-geography, from where it originates. Previous time-geographic studies have similarly focused on the various contexts of individuals' daily activities, for example, the structure of individuals' time allocation to everyday routines and thus livelihood projects

(Westermark 2003; Forssell 2001; Wihlborg 2001; Friberg 1993; Pred 1981); households' energy consumption embedded in daily activity patterns (Ellegård 2008; Palm & Ellegård 2011); temporal patterns in daily occupations (Kroksmark *et al* 2006; Björklund *et al* 2013); and gendered everyday mobilities (Scholten *et al* 2012). Previous time-geographically inspired studies on rural situations and spatial practices have been presented by Carlstein (1982) and Pred (1986). Their studies represent close parallels to my study – yet unfortunately, the cases selected are distant geographically and/or historically. Carlstein (1982) studies human time allocation in pre-industrial societies, with the main objective of conducting comparative studies of the use of time resources in different 'society-habitats' such as the situation of hunting-gathering, tropical short-fallow cultivation, or irrigated cultivation. The approach is classic time-geographic, while the author's main interest is anthropological and directed towards reforming the concept of *carrying capacity* by considering activities and time-resources (the time-budget of the population) rather than population density and (food) resources solely. Carlstein (1982) also shows that the reasons for intensification in natural resource use may lie in the intentionality and social rationality incorporated in human projects. His study presents details of 'other times in use', for example concerning the timetable of watering as a socio-ecological arrangement (Carlstein 1982:273ff.), or the interaction of nomadic pastoralists with other movables such as goats, sheep, camels, and the main household comprised of the elderly, women and children (Carlstein 1982:119ff.). Carlstein's work demonstrates that activity systems have their own logic and temporal organisation; it displays parallels with my study in its interpretation of land as *space-time,* and in making explicit that time resources have a practically, tangibly limiting effect on the utilization of resources other than time (Carlstein 1982:292). Pred (1986) focuses on time allocation for farming activities before and after the enactment of one of the three Swedish enclosure reforms. His study contains detailed narration (and one time-geographic notation-based example) concerning the daily paths and concrete interactions of smallholder farmers in conjunction with the variety of agricultural projects before and after the reform. Pred (1986) provides a detailed empirical description by which he seeks to clarify the reproduction of social (power) structures from the point of view of concrete, everyday occupations. The central concepts used in his analysis are *place*, *path* and *project* (Pred 1986). When taken together, the rural studies by Carlstein (1982) and Pred (1986), and the one presented here (for all it is more limited in scope) offer perspectives on the crucial role of the organisation of time resources in the day-to-day life of rural dwellers, and in the reproduction (or change) of the rural landscape.

The consideration of time-economy in farming can facilitate the analysis of the case-specific socio-ecological environment of farms. Time-economy might offer the possibility to develop the implications of full-time, part-time or hobby farming on landscape practices (e.g. Kristensen *et al* 2004). In this context, Gaube and colleagues (2009) describe by time (demand and availability) the social dimension on a particular farm and of farming activities.

Spatial Factors

Materiality influences the activities of the farmer, who can be seen as a "*mediator*" between society and landscape, and hence as a "*driving force*" of landscape change (as formulated by Kristensen

2003:6). The study presented here focuses largely on the working of what has elsewhere been conceptualized as the 'natural/structural' drivers of landscape change (i.e. topography, soils and climate, spatial structure including infrastructure, Schneeberger *et al* 2007:350). By studying land use from a process, i.e. time-perspective, the role that space (and the things that comprise it) paly in its accomplishment can be highlighted. 'Spatial' factors motivate clearance actions, I have found, but induce also decisions to switch to less intensive modes of land management.

The spatial factors discussed in this study are of two kinds. The first refers to spatial factors that are intrinsic to unique places. Examples of these factors are the size and shape of fields (where regional regularities can be assumed to exist), the relative location of parcels to each other and to the farmstead, and the part played by whatever is contiguous with fields. To a certain extent farmers can manipulate this kind of spatial factors by means of forest clearance and land deals with neighbours, and my study confirms that farmers do implement these strategies. The second kind of spatial factors which influence land use decisions mentioned by the farmers interviewed refer to regulations expressed as statutory measures per hectare; examples of these are the maximum permitted animal density per hectare of grazing area during the mandatory outdoors grazing period, and the required manure spreading area per animal unit. The latter kind of factors can be regarded as spatially dependent, and appear to allow for quantification more readily, for example via farm data on farm animals and available arable land. The first kind of factors on the contrary appears difficult to quantify, for example in a coupled model of land-cover processes.

The approach employed in my study to abstracting locational and land-cover processes onto a formal level produces a generic model of landscape development that can inform other cases 'in reality' without the need of an exact match between the data in the new case and the original case from which the findings have been extracted. Previously, spatial factors have been incorporated into statistical analysis by Claessens and colleagues (2009) in a study on surface erosion in southern Spain; their approach combines soil and drainage data with two spatial-social factors: distance to nearest road, and the transport cost and travel time to the main villages. Both Claessens and colleagues (2009:168), and Schmit (2006), who develops spatial modelling and the representation of agricultural land use data, elaborate in detail on the problems associated with the spatial representation, calibration and validation of land use data (such as lack of detail, or the mismatch between the scale of 'real' land use changes and raster map resolutions). Schmit (2006) concludes that the 'modifiable areal unit problem'[106] remains a seemingly perpetual concern that must be acknowledged rather than solved (Schmit 2006:82-106). These kinds of problems must also be considered when attempting to identify factual regions characterized by the opening-up landscape dynamics indicated by this study.

A further step could be the identification of quantifiable parameters based on qualitatively derived results such as are presented here or in previous research. Such an approach has been presented by Boonstra and colleagues (2011), who add a sociocultural variable – farmers'

[106] The modifiable areal unit problem describes the mismatch between different spatial units due to the way in which their boundaries are drawn, as these not always converge with the phenomenon studied in its natural distribution, leading to a problematic of representation (cf. Dent 1999).

interest in nature – into a statistical analysis of farmstead and winter wheat field biodiversity, the latter being measured by variables such as biodiversity index, and wildlife richness in terms of weeds, specific insects and birds. (The authors found a positive correlation between farmers' interest in nature and biodiversity in the agricultural landscape).

Landscape Development

Previously, a study of farms in the area of the *land use farms* shows that arable fields were from the 1970's onwards transformed into permanent, less intensively managed grassland due to farm-external employment together with the urge to keep the land open (Stenseke 1997) – thus the process of land-cover continuity was in effect already before 1990, the point in time which my study departs from. Also the contrary process of expansion of the openness of land is documented by the previous study; in fact, an increase in the number of parcels of land cleared was noted during the 1980's, while otherwise clearance activities were mainly documented during the 1950's and earlier (Stenseke 1997). Three reasons in particular were offered for the more recent clearings, the wish to have either forest land or cropland, nothing in-between, further the wish to reshape fields and rearrange land, yet the motive: "*to work a bit is fun*" (Stenseke 1997:82, my translation) was also mentioned. These motivations and ends differ from those I found during the period 1990-2010, i.e. gaining more grazing space, and 'landscaping' nearby the farmhouse, but correspond with the findings encountered on the *clearance farms* .

Several Danish case studies have approached rural landscape development and farm-based processes; however, several structural differences between these fairly close-by regions must be kept in mind, when comparing the results, such as soil composition, or land policy (different systems of land-use zoning). A qualitative study of landholders' locational decisions concerns the placing of new woodlands on farm estates (Madsen 2003). 'Agricultural producers' locate their afforestation areas on fields far away from good production units, whereas 'amenity residents' rather plant the total area (although, judging by the examples presented, the immediate surroundings of the farmhouse are generally left open), whereas 'countryside residents' "*afforest only part of the farm, leaving fields for agricultural production, most often as pastures*" (Madsen 2003:191). Madsen observes that production-oriented landholders create afforested parcels with "*often straight, quadrangular [form that] (…) follows the existing property borders*" (Madsen 2003:191), while residency-oriented landholders create afforestation areas with forms that "*often follow [...] lines in the landscape, and the fringes are sinuous*" (Madsen 2003:191). These findings underscore my interpretation along the line that farmers construct the landscape not only according to their perception of the land, but also according to the different ways of practical interaction with the land, for example as a producer whose focus is on outcome, or as a resident with an interest in how the landscape looks.

Based on Danish cases, Primdahl (1999) notes that other-than-production factors play-in when farmers decide on landscape changes (here: changes in land cover and landscape elements). In Denmark, such post-productivist mode of land use (Kristensen *et al* 2001, 2004), is seen in conjunction with an observed increase in the wooded area, permanent grassland and uncultivated land during the research period 1990-1995 (Kristensen *et al* 2004), results that reinforce other Danish studies documenting

trends of less intensive land management. In the earlier study (Kristensen *et al* 2001:316), the post-productivist trend is associated with agriculturally marginal areas, which are found likely to acquire a more forested appearance. The agriculturally marginal situation would correspond to the landscape studied here (the *land use farm* study), where persistent maintenance of openness of land can be seen as unexpected, as discussed in this thesis. Simulations of future land-use patterns indicate reforestation trends in case areas in Austria (Gaube et al 2009); and on the European scale (Rounsevell et al 2006). The findings from my study suggest that such trends might need to be nuanced, at least when specifying developments on the local level, and in areas lacking 'constraining' land-use zoning, i.e. where land use conversions are possible.

Furthermore, Danish case studies suggest, based on comparison of farm data for 1996 and 2008, a change in the composition of landscapes in terms of types of farms: A "*relatively homogeneous structure dominated by small to middle sized family farms*" is observed to give way to "*a more polarized structure with few, relatively larger full time farms and many small farms occupied by part time and hobby farmers*" (Primdahl & Kristensen 2011:113). This result describes the situation found in the *land use farm* study in 2010 concerning the symbiotic existence of few large farms and many minor properties that lease out their lands to larger enterprises. This picture is supported by parish statistics on land use. In the parish, in which the *land use farms* locate, the number of small agricultural enterprises (managing 2-5 ha arable land) has increased since 2005 and is in 2009 higher than during the whole period since 1971; the number of large farms with more than 50 ha arable land under management has remained constant in the range between 1 to 3, mostly totalling to two farms (Statistics Sweden 2010c). Primdahl & Kristensen (2011) further observe "*that the majority of farm owners see their farm primarily as a living place followed by a smaller group of farmers who see their property as an equal mixture of a living place and a production place*" (Primdahl & Kristensen 2011:113) – a finding that apparently characterizes fairly well the findings in my study. The degree of activity and the goals of farm ownership (the farm project) accompany each other according to both of these findings. This seems to reinforce the question of the valuation of open arable land, but also in particular, why the forest re-growth reported by Kristensen and colleagues (2004) is not occurring in the region in which the *land use farms* locate to such notable extent as in the Danish cases studied? I have suggested only one explanation to this question, namely the relatively forested character of the landscape, with its constant tendency to forest re-growth.

My study supports the finding by Primdahl (1999) that "*[e]ven when the farmer and the owner are the same person, the `owner' may take very different types of decisions than the `producer' does*" (Primdahl 1999:143). I have however seen that for the 'owner', too, the maintenance of the productivity of land, or rather, the conserving production-related values, is important. Perhaps it could be suggested that the landed values and the production-related values are closely interlinked. This might have to do with the landowner's necessity (not only priviledge) to engage with land in one or another way. Apparently, a tension may nevertheless exist between the production- and ownership-related values, also in the cases studied here: Farmers described a situation in which lands were 'locked' in 'passive', i.e. non-productive, use by EU-farmers who were reported to manage their lands with low intensity. The attitude to land as private property was explicitly criticised by one

interviewee. I have found that the values attached to the open arable land have both a pictorial and a material aspect, which can be thought of as an amenity vs. a production orientation.

The findings concerning recent forest clearance presented in this thesis are relevant to understanding of boreal land use trends. Forest clearance for arable use counterbalances the reforestation trend; a study in preparation (Solbär, unpublished) and Solbär (2011) offer more detail concerning the distribution of recent forest clearance throughout Sweden. Forest clearance appears to have concrete situational causes, alongside with general reasons such as the need for more land. This kind of complexity has been described by Stenseke (1997) in her study of the reasons for land use change: She describes field-level land use changes as influenced by *general*, *individual*, and context specific or situation-specific '*releasing' factors* such as afforestation as 'revenge' on the field where the tractor got stuck (Stenseke 1997:90–103, my translation). In the cases Stenseke (1997) studied, further factors of the latter kind were changes to farm management, to the working capacity on the farm, or to the arrangement of owned/leased parcels; further, new priorities by a new farm owner were mentioned. Concerning several of the clearance projects discussed in this thesis, it is observable that the motives behind (the concrete placing of) clearings display a complexity of reasons behind land use changes. Thinking from a farmer's point of view, such complexity might represent a goal in itself: a good placing (of new land) should offer several benefits, while the researcher perceives a (possibly bewildering) complexity.

Finally, since clearance obviously creates 'better' land for arable use, one can wonder why some farmers, but not others, choose to expand their farm domains by clearing forest. A partial answer to this question suggested by my study is the observation of farm land fragmentation on contemporary farms. This phenomenon seems to be somewhat more farm-specific than, for example, the currently high price levels of arable land, which several respondents offered as a motive for clearing one's own land, or the annual income provided by arable land in contrast to forest land. The latter kinds of factor are present in the reality of many farmers, although the majority of them do not engage in forest clearance for arable use. Also the extreme counter-situation to fragmentation seems to trigger forest clearance: Land can be cleared in order to remove a last patch of forest on a otherwise compact farm domain.

The fragmentation of farm land is an interesting finding in its own right, when put into a wider geographical and historical context. This issue has been discussed as characteristic of much of recent rural development in Sweden (e.g. Flygare 2011a). The analysis has however departed from agricultural statistics: as of 2003, 41% of all agricultural enterprises were at least partially based on leased land – a figure which represents a steady increase since the 1960s; recent data (2005, 2007), however, indicate a break in the trend such that the proportion of agricultural enterprises fully based on owned land has turned upwards, a change that has been seen as an effect of the single-farm payment scheme in force since 2005 (Swedish Board of Agriculture 2011; Flygare 2011a). My study has highlighted more spatial and farm-management-related facets of this phenomenon. To put the recent fragmentation into a historical context, we can recall the statement by one of the interviewees, who said, after describing difficulties in getting access to land, that it happens that farmers conduct a "*land reform of their own*" (farmer interview) in the sense of exchanging lands with each other in order to reorganize their

management units. 200 years ago, three enclosure reforms were enacted in Sweden with the aim of bringing about a re-arrangement of farm land. Farm land had previously been distributed as village units, in which individual farmers held numerous strip-parcels scattered over the village domain; the goal of the reforms was consolidation of land into single landholdings, and at the same time there was a dispersal of farmstead locations, so that many farmhouses, instead of being situated in the village itself, were now located on individual sites (Helmfrid 1961; Hägerstrand 1988). A limited but concrete example of farm land fragmentation before and after the enactment of one of these land reforms provides a good illustration:

"Before [the land reform], household 'number one', a representative case from the village of […], had only three of its 26 parcels completely within a half-kilometer radius of its homestead. Following available roads and paths, the far reaches of the household's most remote cultivated strip were about 2.3 kilometers away and the outer boundary of its most distant meadow parcel was another 400 meters away. After [the land reform] the holdings of the household were split up into two separate consolidated farmsteads, each of which had a maximum width of 800 meters. If new homesteads were constructed somewhere near the center of these units, as later maps seem to indicate, no point would have been more than one-half kilometer distant." (Pred 1986:117).

The distances to the fields were covered together with slow-moving draft animals, which concretely involved a team of several oxen and horses pulling whatever implement was needed on the field (Pred 1986:122). Therefore, a kilometre or two was a substantial distance at that time. Pred (1986:111) maintains that the time savings generated by the rearrangements were invested into the land, into a more intensive cultivation. Flygare (2011a:84) explicitly connects today's situation to what she describes as a 'rampant' structure of land-use and ownership during the 19th century; today, land ownership and land management to a large extent exist separately from each other, and as a result the rural land-use situation is difficult to overview. The fragmentation of farm domains documented in this study displays this in its farm-level consequences.

Farming Creates the Land

A need to more deeply understand and adapt to the reality of farming, and a need for a profound reorganisation of agriculture which acknowledges that it is 'more than a food production sector' is obvious. While the crucial role of farming for the (spatial!) production of the rural countryside (e.g. Gunnarsdotter 2005), and the perception of the countryside as valued as a place where people spend leisure time and carry out hobby activities (Jansson & Wästfelt 2010) are discussed in general, there is a lack of knowledge in the pre-conditions and situatedness of farming.

The findings presented here suggest that phenomena such as the diminished role agriculture in the national economy and the orientation towards consumption of rural landscapes, on their flip side hide a sometimes painful re-orientation of farm projects. Such farm projects were embarked upon as a way to make a living (concerning this problematic, including the pressure on farmers to re-orientate, see also Nordström Källström 2002, 2008; for Finnish farm cases, see Uthardt 2009). This recent development challenges the meaningfulness of open arable fields on farms in situations in which the capacity to manage the land is constrained by poor returns. Such meaningfulness consists in a beneficial relation of

each particular field to the farm as whole with its on-going farming activities and the time-economy of the farmer(s). Openness of land can become a burden to farm management, which leads to a weakening of the beneficial relationship between the farm and the field; indeed, the 'beneficialness' might eventually disappear completely, rendering the piece of land meaningless to the farm project – a development that would be likely to lead to fallow and successive forest re-growth.

In this context, I suggest further development of the concept of *time-economy* described in this thesis. Time-economy can be seen to play an influential part both in the case of land-use continuity and in the case of land-use conversion discussed here: it is for time-economic reasons that small-sized parcels are problematical; it takes time to turn frequently and to move between several small parcels instead of one larger one, and so on. Yet, it also takes time to drive *over* a field and to drive *to* a field. The decision to shift to less intensive modes of land management is grounded in time-economic considerations when it is a result of the need to allocate time to farm-external occupations. Furthermore, my findings show that the pursuit of time-economy is not necessarily restricted to large agricultural enterprises; rather, it is about the ability to manage the farm, any farm, using the given time resources. What is at issue is the ability to manage land(scape) in a time-economically sound way, as time usage and time demand are directly linked to the spatial characteristics of concrete landscapes. The concept of time-economy developed here is founded on a time-geographic perspective, which emphasises both the interlinking of time and space, and the fact that land use is enabled and limited by materiality and corporeality. Space and time being inherently connected, the spatiality of farming practice makes time one of the main resources for farmers, and means that 'spatial factors' are of central importance in land management. In fact, these issues were in focus, from the perspective of farm labour and agricultural economy, as early as 1947 in a doctoral dissertation (cf. Larsson 1947) – i.e. what is put forward here is nothing new. Identifying these timespatial factors at work is highly relevant to agricultural and landscape research, and our understanding can be deepened by considering further the relationship of time-economy with the farmer's access to other resources (economic, technological) and capabilities (strength, persistence), and with the intention the farmer follows when engaging in farming. For example, Schmit's (2006:103) argument that the urge in farmers to minimise transport costs and travel time is rooted in purely economic considerations appears rather reductionist – especially when recalling one of the interviewees in this study saying that distance "*takes time and fuel*" (farmer interview).

The Conceptual Landscape

The importance of valuation of rural land and places has been previously described by several authors from different angles (e.g. Setten 2002; Flemsæter & Setten 2009; Stephenson 2005; Gunnarsdotter 2005). I have suggested that valuation of arable land is carried by and results in an orientation that entails commitment to farm management and at the same time plays a role in identity formation. This supports previous findings concerning the crucial role of heritage in rural land management (Setten 2006; Flemsæter & Setten 2009); and mirrors the suggestion by Setten (2002) and Setten & Mels (2007) that farming practice can be interpreted as a re-enactment of place-based ways of being, i.e. tacit dispositions concerning how to act and

behave, conceptualized by Bourdieu as *habitus* (Wilkens 2007).

In the context of landscape planning, Stephenson (2005) has developed a cultural values model to assess the co-presence of various intertwined landscape values and, to take this a step further, has created a tool for specifying the spatial distribution of the thus assessed landscape values (Stephenson 2005, see also Stephenson 2010). Such dimensional way of representing significances in landscape and their links to each other across space and time may prove more fruitful than an approach that pinpoints landscape qualities to physical attributes. Key concepts with a dimensional content in the framework proposed by Stephenson (2005:214ff.) are *nodes*, *networks*, and *spaces* that create a *web* of significant dimensions in a given landscape (I referred to this particular conception of space in Terminology). Without going into detail concerning the dimensional model, I pick out the concept of *node* and suggest that, in the sense proposed, this concept describes well the significance of arable fields found by my study. The concept of *node* identifies, Stephenson (2005) specifies,

"an elementary point of significance: usually smaller than the concept of place, but sometimes overlapping, it may be important visually or functionally as a place of meanings, as a juncture in a network, the location of an action, or as a place of remembrance" (Stephenson 2005:215).

Nodes may contain both surface and embedded values (Stephenson 2005:306). To me, the suggestion of including a minor unit under the umbrella of landscape appears very useful to landscape research, and I would maintain that my findings confirm the plausibility of conceptualising such units of significance. The arable fields represent "*concentrations of value*" (Stephenson 2005:215) that cannot fully exist without their landscape and temporal context. An additional aspect of importance touched upon by Stephenson (2005) concerns physical presence: nodes do not necessarily possess physical limits, or even physical presence. The arable fields in this study are physically, but also more-than-physically present: the farmers' accounts often represent arable land as being laden with a value that surpasses the merely physical state of the field, and carries both a temporal dimension and a symbolic content. The notational analysis of the process of clearance, in contrast, brings out the purposeful physical transformation that is associated with making land arable and results in a fine-grained *abundance*. When one works out concepts that detail the internal structure of landscape, I would suggest that this structure could be made dimensional in a concrete spatial sense. These aspects are of great relevance to studies on rural land use, in my understanding, especially for the substantive conception of *landscape* and connect to the way, in which Schatzki (2010a) thinks of the *timespace of human activity*.

The theoretical discussion of *landscape* presented in this thesis provides a differentiated picture of the working of *landscape* in a spatial activity as farming as a frame of reference. I have argued that the performance of meaningful activities relies on particular ways of seeing, and of living, in conjunction with apprehending the land as resource. One might argue that the time-geographical concepts *project*, *pocket of local order* and the notion of *restrictions* not touched upon here could bring out rather similar aspects of the farmer–land-cover interaction. This might especially be true when considering Hägerstrand's late work (Hägerstrand 2009). I have by the choice of concepts seeked to highlight the crucial role of materiality and of the interaction of things distinct from each other on individual trajectories, at the same time part

of meaningful arrangements that bring about the arable field. Hereby, I have found especially helpful the discussion of the (experiential) dynamics of the embodied situation by Ahmed (2006, 2010) for linking land-use decision-making and land-cover processes. The inner experiential and the exterior aspect of mobility remain apart in Hägerstrand's work (2009), conceptualized as inner and outer worlds, although he acknowledges that these worlds interact. The theoretical contribution of my study is about activating *landscape* as a mediator by bringing in *activity timespace,* and *orientation,* which highlighting the process character of corporeal existence (to remember here, the description of process in the Introduction). According to this thesis, *landscape* can be seen as an active interface between the farmer and land. The three-part conceptualisation of *landscape* can make understandable how an arable field is kept oriented towards arable use by work present as its background, so to speak, through generations.

Using the three-part conceptualisation of *landscape* is in my understanding especially relevant to studies on spatial practices such as farming, where active intervention into the material features of the land cover is everyday work, as it covers landscape as a detached object with landscape as a lived-in place and community, without disregarding physical land-cover processes. This is because practical activity also relies on reflection and evaluation, not only on performing the doing of the work. However, such dynamic conception of *landscape* may prove useful in other studies on socio-spatial aspects of land cover change (a topical issue in environmental and climate research) and in other areas of research concerning natural resource management.

To conclude the thesis, I would like to call for a renewed approach to research on land use and landscape. My argument has been that the materialities involved constitute an inescapable and existential precondition, thereby shaping land-use choices in crucial ways. The sustainability of the modes of organisation that currently exist in areas of rural land use is under debate, not least when it comes to farming and agriculture. In order to move on from a position characterised by critique, I suggest departing from the prevailing perception of human interaction with nature as a solely negative and disturbing interference; one question on which I reflect is, why should we not strive for a productive rural land use that once more carries potential to 'produce' valuable habitats and rich biodiversity?! A past example of this from the Nordic landscapes was the use of bio-diverse grasslands, wetlands and broadleaf woodlands; these were productive and actively managed types of land cover that represented "*the most important forage-producing areas during historical time*" (Ihse & Norderhaug 1995:161); today, however, "*[t]hat kind of landscape is no longer considered sufficiently productive*" (Ihse & Norderhaug 1995:160). Success in this respect will clearly depend on the *mode* of land use, i.e. the kind of farming the farmer enacts on a daily basis, rather than on human intervention (human land use) as such (cf. Ahnström 2009:51-58; Boonstra *et al* 2011:421ff.; Jansen 2011:184). Jussi's initial reclamation act has, multiplied, led to exploitation and losses of ecosystem functions and services; however, there are examples that show that farming also can enhance natural processes.

My supposition is that future sustainability in rural land use, ecologically and socio-economically, will go hand in hand with deeper understanding of the 'human situation' – a situation that embraces the necessity for us to interact with land. In this context, I think it is important to acknowledge that humans' relationship with the earth is about the produce

from land, but also about more – the contact and engagement with land and natural environments appears to be important to us in various ways (Adevi 2012). I suggest accordingly that research needs both to acknowledge this fact and to make it a starting point when dealing with the issue of sustainable management of land resources and natural resource extraction. In such a perspective, the 'use' of land may provide us with an opportunity to *learn* sustainability; research into this field can benefit from the concept of *landscape* due to its ability to mediate, in other words, its ability to describe the interaction of humans with their surroundings. This is because landscape can be brought near to us while remaining a signifier of something wider; thereby understanding landscape can be part of learning about ourselves, which is what I believe we need to do when learning about and moving towards sustainable modes of earthly existence. In order to achieve this, the concept of *landscape* must be released from being treated as something detached from human affairs – somewhere farther off (or placed completely inside the heads of people) – and be 'put to work', acknowledging that we construct landscapes while simultaneously the landscapes construct us.

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Appendices I. – VII.

Appendix I. Farms Studied

Table A. Clearance farms CF 1 – CF 11.
The number of clearings indicates projects that were currently worked on or recently accomplished.

Farm code	Location	Owned land (ha)			Managed arable	Farm production	Clearings	
		Arable	Forest	Total	incl land on lease		Number	Size (ha)
CF 1	north	23	400	423	95	dairy with hay	3	1.5, 1.3, 4
CF 2	north	110	170	280	238	dairy with hay	2	2, 12
CF 3	north	150	160	310	250	dairy with hay	1	8
CF 4	east		3		120	mixed arable/animal (poultry)	2	16, 8
CF 5	east	74	110	184	180	arable	1	20
CF 6	west		110		378	mixed arable/animal (pigs)	3	1, 3, 3
CF 7	east	65	0	65	108	arable	1	4
CF 8	east		52		149	arable	2	3, 15-19
CF 9	north	60	250	310	160	beef with hay	3	3, 12, 7
CF 10	east	140	55	195	235	arable	2	5, 11
CF 11	west	210	30	240	230	mixed arable/animal (pigs)	1	8

* east=Gotland, west=Västra Götaland, north=Västerbotten

Table B. Land use farms LUF 1 – LUF 24.

Farm code	Owned land (ha)				Managed arable	Cattle	Crops	Farm project
	Cropland	Pasture	Forest	Owned total	incl land on lease			
LUF 1	35	12	43	90	0	leaseh	leaseh	farm→home
LUF 2	10	2	12	24	0	leaseh	leaseh	farm→home
LUF 3	10	3	30	43	0	no	leaseh	farm→home
LUF 4	20	12	16	48	0	leaseh	leaseh	farm→home
LUF 5	8	14	14	36	22	cattle	hay	farm
LUF 6	20	5	65	90	20	leaseh	cereals/leaseh	farm
LUF 7	7	2	3	12	9	cattle	hay/cereals/peas	farm
LUF 8	25	10	38	73	35	cattle	hay/cereals	farm
LUF 9	22	9	15	46	41	cattle	hay	farm
LUF 10	31	5	105	141	0	no	leaseh	farm→home
LUF 11	18	*	185	203	0	no	hay	home
LUF 12	11	*	12	23	0	leaseh	leaseh	home
LUF 13	3	-	5	8	3	horses	hay	farm
LUF 14	15	*	10	25	1	cattle/leaseh	leaseh	home
LUF 15	7	14	46	67	9	sheep/leaseh	hay/leaseh	farm→home
LUF 16	2	2	6	10	0	leaseh	leaseh	second home
LUF 17	35	2	135	172	0	leaseh	leaseh	home
LUF 18	15	8	20	43	0	leaseh	leaseh	home
LUF 19	7	15	4	26	46	cattle	hay	farm
LUF 20	4	9	12	25	0	leaseh	leaseh	home
LUF 21	13	*	12	25	300	cattle	hay	cattle
LUF 22	10	15	4	29	25	cattle	hay	farm
LUF 23	17	*	8	25	120	cattle	hay	farm
LUF 24	9	3	34	46	0	leaseh	leaseh	second home
Totals	*354*	*142*	*834*	*1330*	*631*			

*arable

- no pasture

Appendix II. Interviewees and Experts

farm case type	code	farm owner since	Interviewee	present	inheritance	date	date 2	date 3	place
cf	1	1973	couple		no	*20100920	*20101007	20110712	home
cf	2	1973	man	adult daughter	yes	*20100920	*20101006	20110714	home&field
cf	3	1982	couple		yes husband	*20101021	20110713		farm office
cf	4	1985	couple		yes husband	20110827			home&field
cf	5	1986	man alone	adult son	yes	20110608	20110816	20110819	home&field
cf	6	1988	man		yes	20110721			field
cf	7	1991	couple		yes husband	20110829			home&field
cf	8	2009	woman		yes	20110826			home&field
cf	9	2010	man alone		yes	*20101008	*20101019	20110715	field
cf	10	?	man	teenager sons	yes	20110819			home&field
cf	11	?	man		yes	20110708			farm office
luf	1	1958	man	wife	no	20100311			home
luf	2	1959	couple		yes husband	20100617			home
luf	3	1963	man	wife	no	20100217			home
luf	4	1965	man alone		yes husband	20100219			home
luf	5	1967	man	wife	yes husband	20100311			home
luf	6	1969	couple		yes husband	20100216			home
luf	7	1972	man single		yes	20100222			home
luf	8	1973	couple		yes wife	20100319			home
luf	9	1975	couple		yes husband	20100216			home
luf	10	1976	woman	husband	yes husband	20100223			home
luf	11	1976	woman alone		yes	20100420			home
luf	12	1978	couple		yes husband	20100610			home
luf	13	1978	man		no	20100312			home
luf	14	1979	man alone		yes	201006xx			home
luf	15	1981	woman alone		yes	20100218			home
luf	16	1984	woman		yes	*20100325			phone
luf	17	1990	couple		yes husband	20100617			home
luf	18	1990	couple		yes husband	20100324			home
luf	19	1990	couple		no	20100611			home
luf	20	1993	couple		no	20100312			home
luf	21	1993	couple		no	20100322	20110405	20110414	home
luf	22	2000	woman		yes	20110630			home
luf	23	2000	man		yes	20100324			home
luf	24	2005	couple		no	20110414			home

alone = single, divorced, or widow(er)

couple = man & woman, both active during interview

** phone interview*

luf = land use farm, first selection round

cf = clearance farm, second selection round

Expert interviews

exp 1	father & son	clearance contractors	20110816
exp 2	man	retailer agricultural machinery	20110713
exp 3	father & son	clearance contractors	20110722
Sven Gunnarsson		land policy	20091221

Appendix III. Observational Guide & Survey, *land use farms*

2010-02-01

LUNDS UNIVERSITET
Samhällsvetenskapliga fakulteten

Institutionen för kulturgeografi och ekonomisk geografi
Lovisa Solbär
forskarstuderande

Intervjufrågor 2010

Vad betyder dina marker för dig?

Vilken bakgrund har ditt ägande av fastigheten/rna?

Har du arrenderad mark?

Hur har du brukat/nyttjat markerna de senaste 20 åren/under den tid du ägt fastigheten/rna?
(exemplifiera)

Hur har fastigheten utvecklats under din tid?
(förklara och visa)

Vilka motiv har funnits för olika driftsbeslut?

Har du funderat över ett brukningssätt som var svår att förverkliga?

Kompletterande driftsinriktningar?

Finns det marker som vid behov skulle kunna odlas upp?

(genomgång av enkäten)

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Sölvegatan 12 hs 16
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Kartläggning av arealnyttjandet 1990-2010 på gårdens skiften
gårdsdrift+markernas nyttjande, brukares mål
Enskilda åtgärdernas och driftsändringarnas orsaker
Anpassning till villkor på platsen och i samhället

När introduceras nytt? När ändras befintligt?

Intervjuperson/datum

Huvudfastighet (trakt beteckning/ägd sedan/bildad/ha):

Övriga ägda fastigheter (trakt beteckning/ägd sedan/bildad/typ/ha):

Tidigare ägda fastigheter (trakt beteckning ägd sedan ha):

vilka ändamål fyller fastigheterna idag för dig som fastighetsägare? (flera svar)

boende på huvudfastigheten (antal vuxna/antal barn)

har du växt upp? på ett lantbruk (1) på landet i övrigt (2) i staden (3)

är fastigheten din födelsegård? nej (0) ja (1)

är fastigheten hushållsmedlems födelsegård? nej (0) ja (2)

är huvudfastigheten? släktarv (1) utökning av markinnehav (2) nyinskaffning (3)

är övriga fastigheter? släktarv (1) utökning av markinnehav (2)

ägd areal idag (ha)

därav utarrenderad (ha) karta

inarrenderad areal (ha) karta

ökning/minskning av ägd areal 2010-1990 (+/-/ 0)

ökning/minskning av arrenderad areal (+/-/ 0)

areal ägd åker idag (ha)

ansvarig för enkätundersökningen: Lovisa Solbär
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areal inarrenderad åker (ha)

om mark avstyckats efter 1990, varför? Karta

om mark tillförts efter 1990, varför? Karta

hur har tillgången till arrendemark i bygden varit sedan 1990?

hur har tillgången till fastigheter i bygden varit sedan 1990?

Har prisutv för fastigheter påverkat dina möjligheter att v b göra tillköp av mark? Nej (0) ja (1)

Har priset på arrenden påverkat dina möjligheter att arrendera mark? nej (0) ja (1)

lantbruket idag

driver du ett lantbruksföretag? Nej (0) ja (1)

om ja, driftsinriktning(ar)? *(se SCB's lista)*

finns det kompletterande driftsgrenar? Nej (0) ja *(1) återkommer nedan*

vilka produkter går till avsalu?

hur viktig är inkomsten från lantbruket för hushållet?

betydande (3) viktig (2) mindre viktig (1)

skjuter du/ni till medel till lantbruket från andra inkomstkällor?

din sysselsättningsgrad?

andra sysselsatta på gården? Nej (0) hushållsmedlem (1) anställd (2) inköpt tjänst (3)

omfattning? Året om, heltid (4), deltid (3), säsongsmässigt heltid (2), deltid (1)

lantbruket 1990-2010

har du drivit ett lantbruksföretag på gården? Nej (0) ja (1)

om ja, driftsinriktning(ar)? *(se SCB's lista)*

andra driftsgrenar? Nej (0) ja (1) *återkommer nedan*

lantbruksprodukter till avsalu?

har inkomsten från lantbruket varit lika viktig för hushållet under perioden?

har din sysselsättningsgrad på gården ändrats?

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andra sysselsatta på gården? Nej (0) hushållsmedlem (1) anställd (2) inköpt tjänst (3)

omfattning? Året om, heltid (4), deltid (3), säsongsmässigt heltid (2), deltid (1)

arealnyttjandet idag (karta)

brukad areal, livsmedel

brukad areal, åkerbiomassa

brukad areal, fodergrödor

fleråriga energigrödor

oanvänd åkerareal

betesmark, kultiverad

naturbetesmark

övrig gräsbärande mark, oanvänt bete

barrskog, produktiv

lövskog, produktiv

blandskog, produktiv

skogliga produkter: timmer/massaved/energiråvara

annan skog

spontan igenväxning

myr- och våtmarker

övrigt,_____

skyddad areal (ha) som vad? strecka i kartan

beskriv hur produktionen från enstaka fält/skiften bidrar till gården

husdjursskötsel idag? ja(1) nej (0)

nöt? Nej (0) ja (1)

om ja, köttproduktion (2) mjölkproduktion (3)

får/getter? Nej (0) ja (1)

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om ja, köttproduktion (2) mjölkproduktion (3)

hästar? Nej (0) ja (1)

om ja, hobby (1) uppfödning (2) ridutbildning (3) ridturer (4) tävling (5) stallplatser (6)

upplåtes sommarbete för hästar, kor eller får? Nej (0) ja (1)

Hur stor andel av djurens foder produceras på den brukade arealen? (%)

Hur stor andel av djurens strö produceras på den brukade arealen? (%)

husdjurssköтsel 1990-2010? ja(1) nej (0)

nöt? Nej (0) ja (1)

om ja, köttproduktion (2) mjölkproduktion (3)

får/getter? Nej (0) ja (1)

om ja, köttproduktion (2) mjölkproduktion (3)

hästar? Nej (0) ja (1)

om ja, hobby (1) uppfödning (2) ridutbildning (3) ridturer (4) tävling (5) stallplatser (6)

har sommarbete upplåtits för hästar, kor eller får? Nej (0) ja (1)

Hur stor andel av djurens foder har producerats på den brukade arealen? (%)

Hur stor andel av djurens strö har producerats på den brukade arealen? (%)

utveckling av arealnyttjandet 1990-2010

har nyttjandet av skiftet varit samma under 1990-2010? Ja (0) nej (1)

notera i karta 2 vilka områden avses

baserad på arealnyttjandets indelning ovan:

vilka grödor har du odlat?

på vilka skiften har de odlats?

beskriv hur skiftena lämpar sig för odling av resp gröda

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vilka skogliga produkter har nyttjats eller sålts?

har odlingen bytt plats för någon gröda?

vilka ändringar i grödor har förekommit?

beskriv ändringens samband med åtgärder inom gården (lista med komplett.siffror)

prova nytt (1) diversifiera (2) omställning (3)

anpassning till förändrade omständigheter (4) Vilka?

(pris av insatsvaror/producentpriser/regelverk/arbetskapacitet/ny maskin/annat?)

sprida risker (5) vilken typ av risker?

källa för kunskap om åtgärden? egen idé/person/media

om egen idé, beskriv hur den uppkom?

om person, beskriv närmare?

om media, beskriv närmare?

beskriv sambandet av åtgärderna med egna mål/drömmar/intressen/kunskaper

är åtgärden en nymodighet i bygden? Nej (0) ja (1)

åtgärdens följder?

övriga verksamheter på gården från 1990 till idag

om det finns kompletterande inkomstbringande driftsgrenar, vilka är de?

nyttjar andra än familjen markerna på något sätt?

jakt till husbehov (1), utarrenderad (2) nej (0)

förbättringar för viltvård eller jakt på markerna? Ja (1) nej (0)

olämpligt för jakt (3), anledning:

vilt i hägn? Ja (1) nej (0), syfte:

fisk- och/eller kräftodling, eller fiske på gården? husbehov (1) utarr (2) nej (0)

förbättringar för fiskvård eller fiske? Ja (1), nej (0)

olämpligt för vattenbruk (2)

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används markerna av det rörliga friluftslivet? Ja (1), nej (0), vet ej (2)

går det vandringsled genom markerna? Ja (1), nej (0)

finns det kulturminnesskyddade byggnader på markerna? Ja (1), nej (0)

används markerna av ryttare? Ja (1), nej (0)

om ja, är ridningen organiserad? I egen regi (1) i annan regi (2) nej (0)

bedrivs turistverksamhet på gården?

mat och dryck (1) bo på landgård (2) konferens (3) nej (0)

bedrivs kulturella aktiviteter på gården? Ja (1), nej (0)

förädlas jordbruksprodukter på gården för avsalu (1) nej (0)

har du gårdsförsäljning? Ja (1) nej (0)

energiråva från skogen? Nej (0) ja (1)

förädling av energiråva? trä (1) biogas (2)

vindbruk? I egen regi (1) utarr mark (2) nej (0) olämpligt (3)

uthyrning? Nej (0) fritidshus (1) permanentboende (2) lokaler (3)

Appendix IV. Observational Guide, *clearance farms*

Skogsröjning intervjuguide för gårdsbesök sommaren 2011

Vilken mark/vilka marker har röjts på garden? Läge, storlek, lokalisering?

Varför har marken röjts?

Hur har röjningen gjorts?

Vilka resurser och kostnader har röjningen krävt?

Gården (storlek, inriktning, ev. läge av brukad mark och skog, övrigt)

Tillstånd?

Annat?

L. Solbär, Institutionen för kulturgeografi och ekonomisk geografi, Lunds Universitet

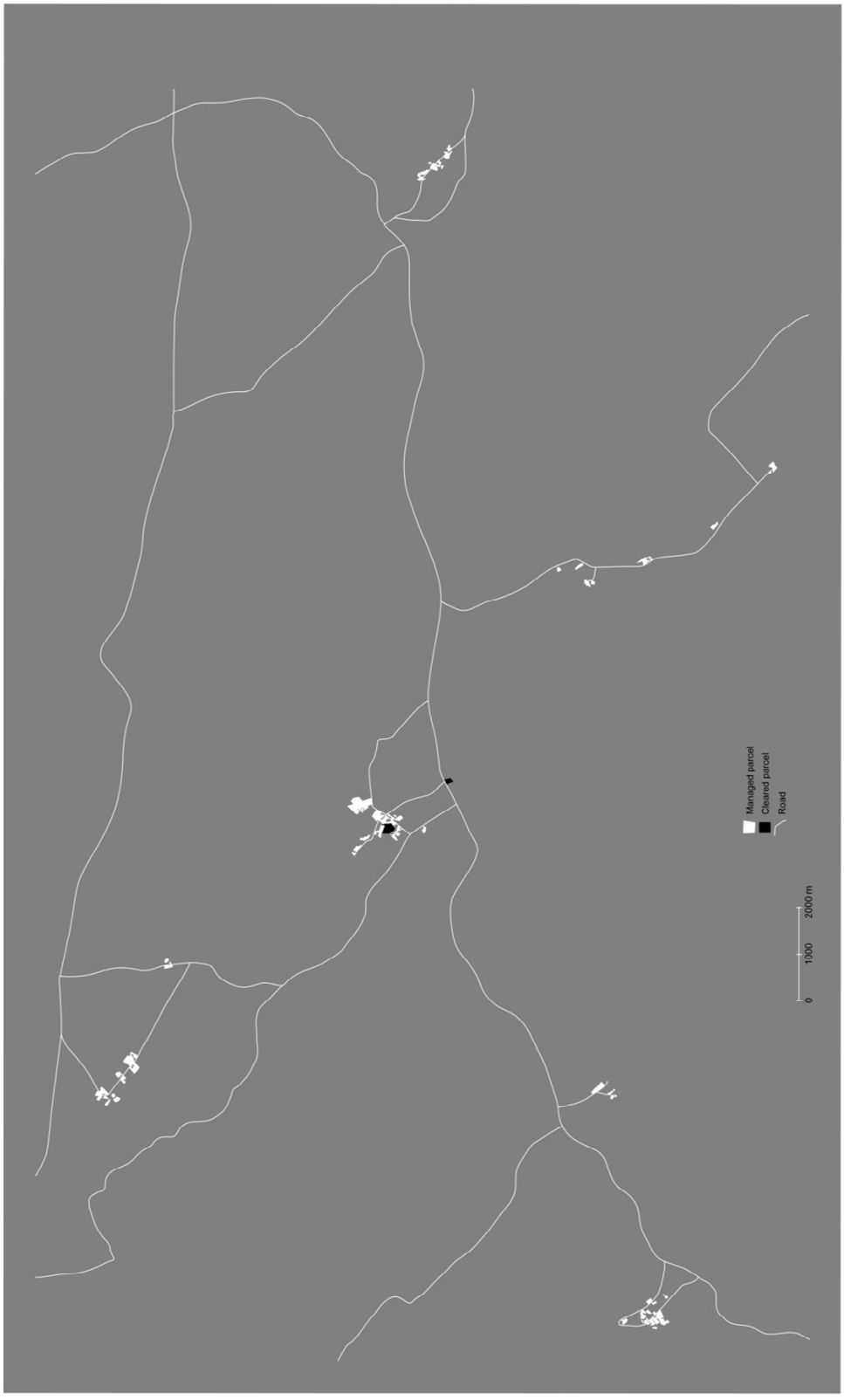
Appendix V. Farm Land Maps, *clearance farms*

The Farm Land Maps are displayed following the order from CF 1 to CF 11, with the exemption of the farm land maps for the farm CF 10, which is contained in chapter B7; for the farm CF 7 a map is presented in B7 and below; following the farm land maps, one of the landscape examples is shown.

The farm land map visualizes the arable land included in the particular farm domain at interview occasion. The locations of single fields and recent clearings (polygons), available road network (lines), and the farm centre (circle) are indicated, while everything in-between has been omitted. The scale bar shown on each map can be used when reading the map to gain an idea of the distances, and the degree of fragmentation of the particular farm domain.

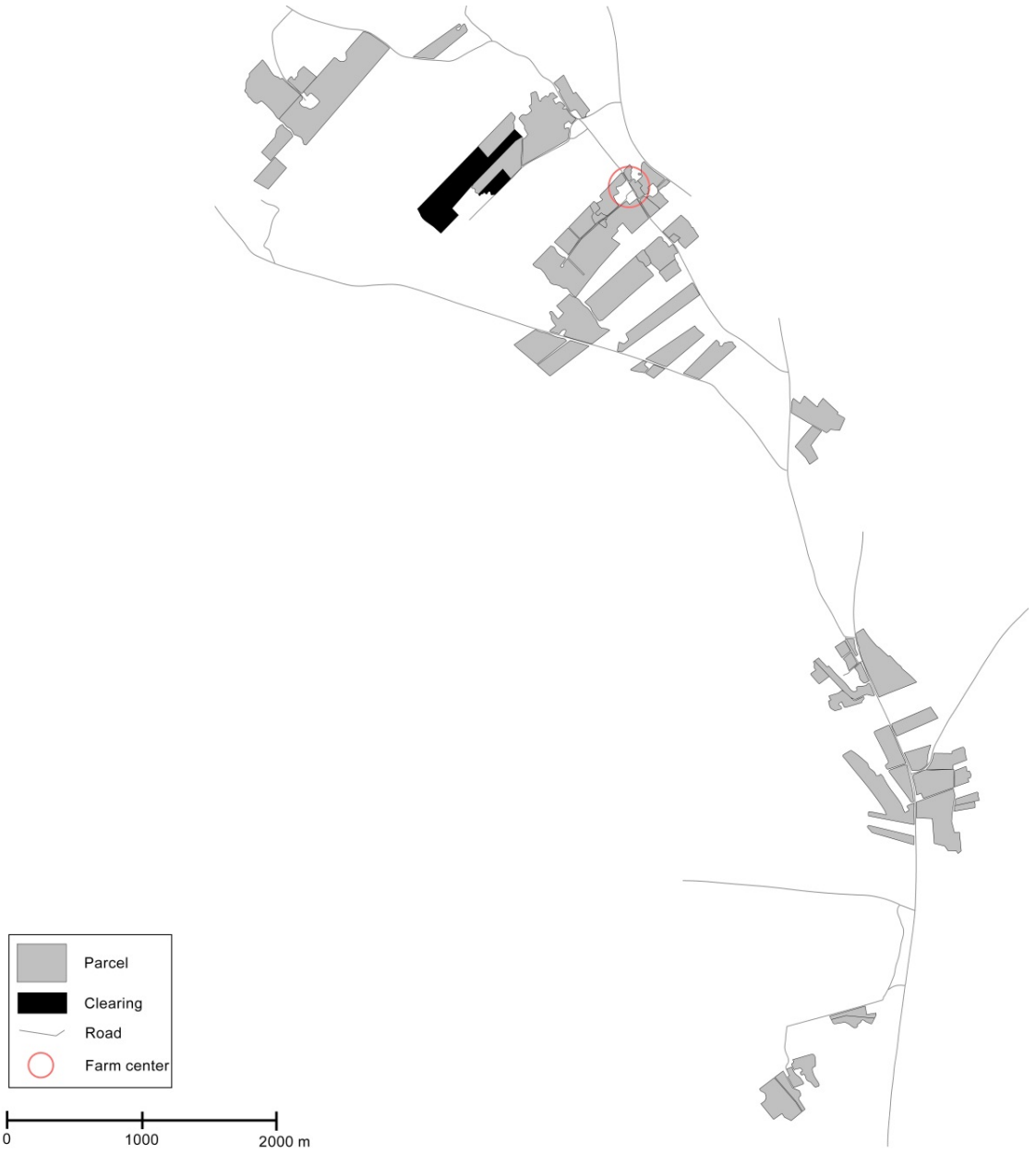
Farm Land Map, Farm CF 1 (Excerpt)

The whole farm domain CF 1 is shown on the next page: This farm domain is very difficult to represent as the distances involved require a completely different scale than the 74 arable fields managed by the farmer– an attempt has been made to use a dark background (see image on next page). The image below shows the three clearings and the managed land at farm centre.

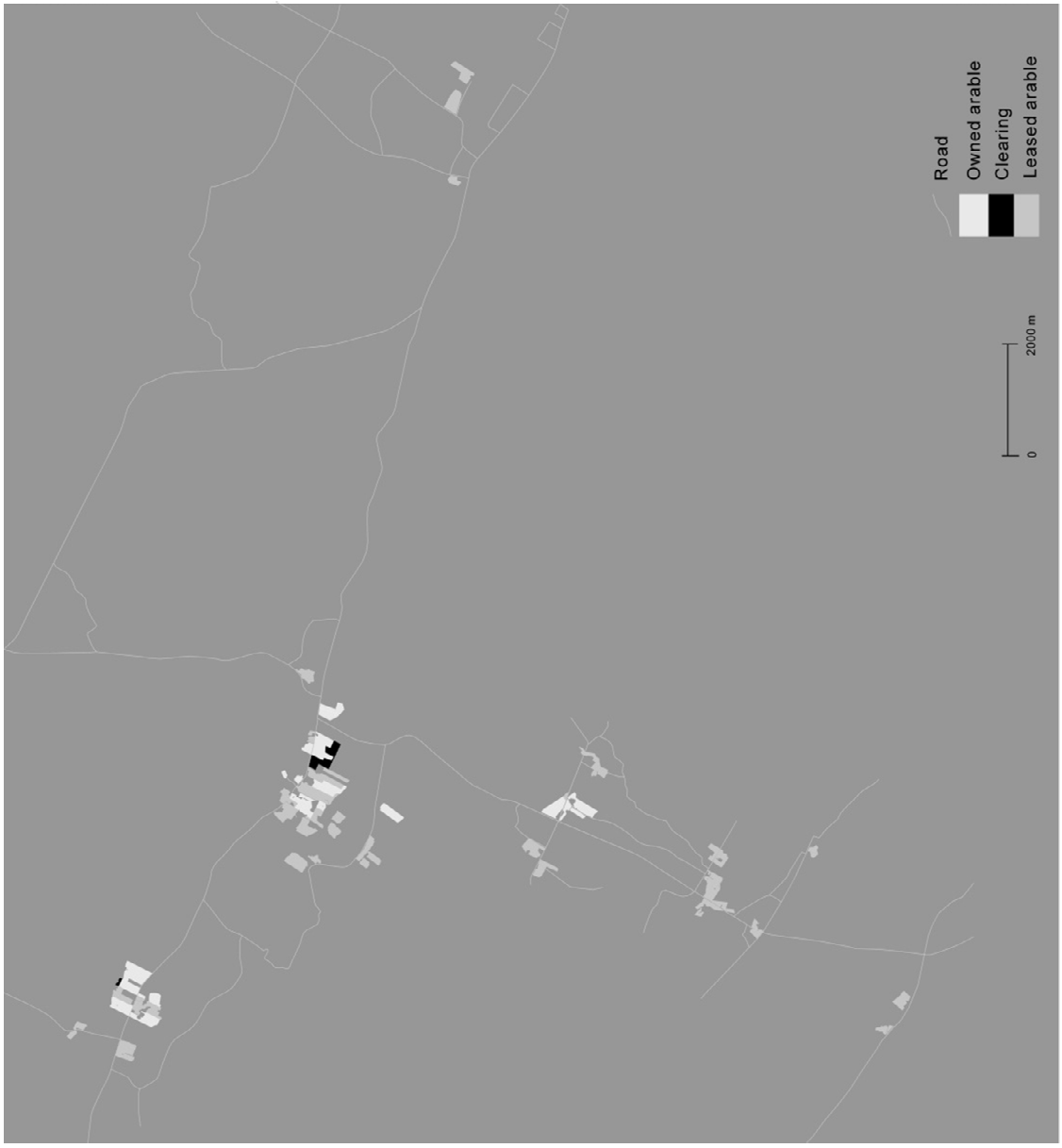


CF 1

Farm Land Map, Farm CF 2

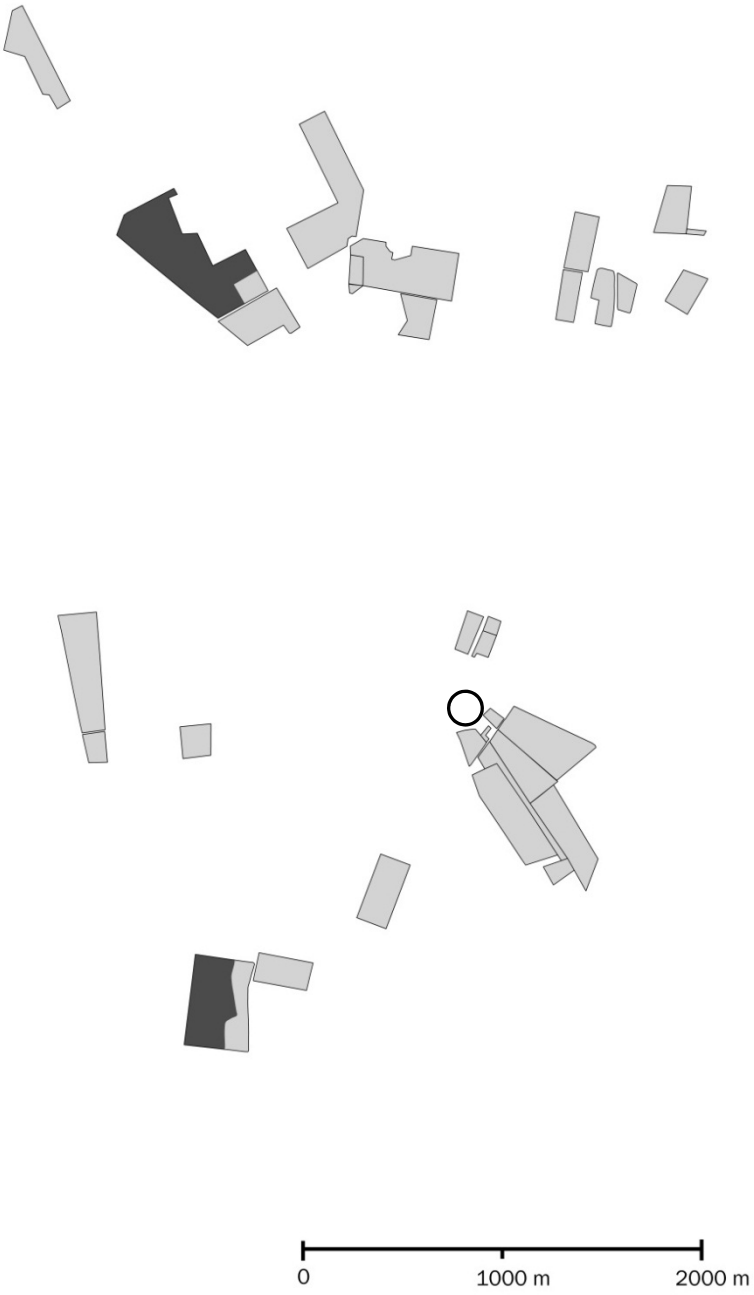


Farm Land Map, Farm CF 3



Farm Land Map, Farm CF 4 (Excerpt)

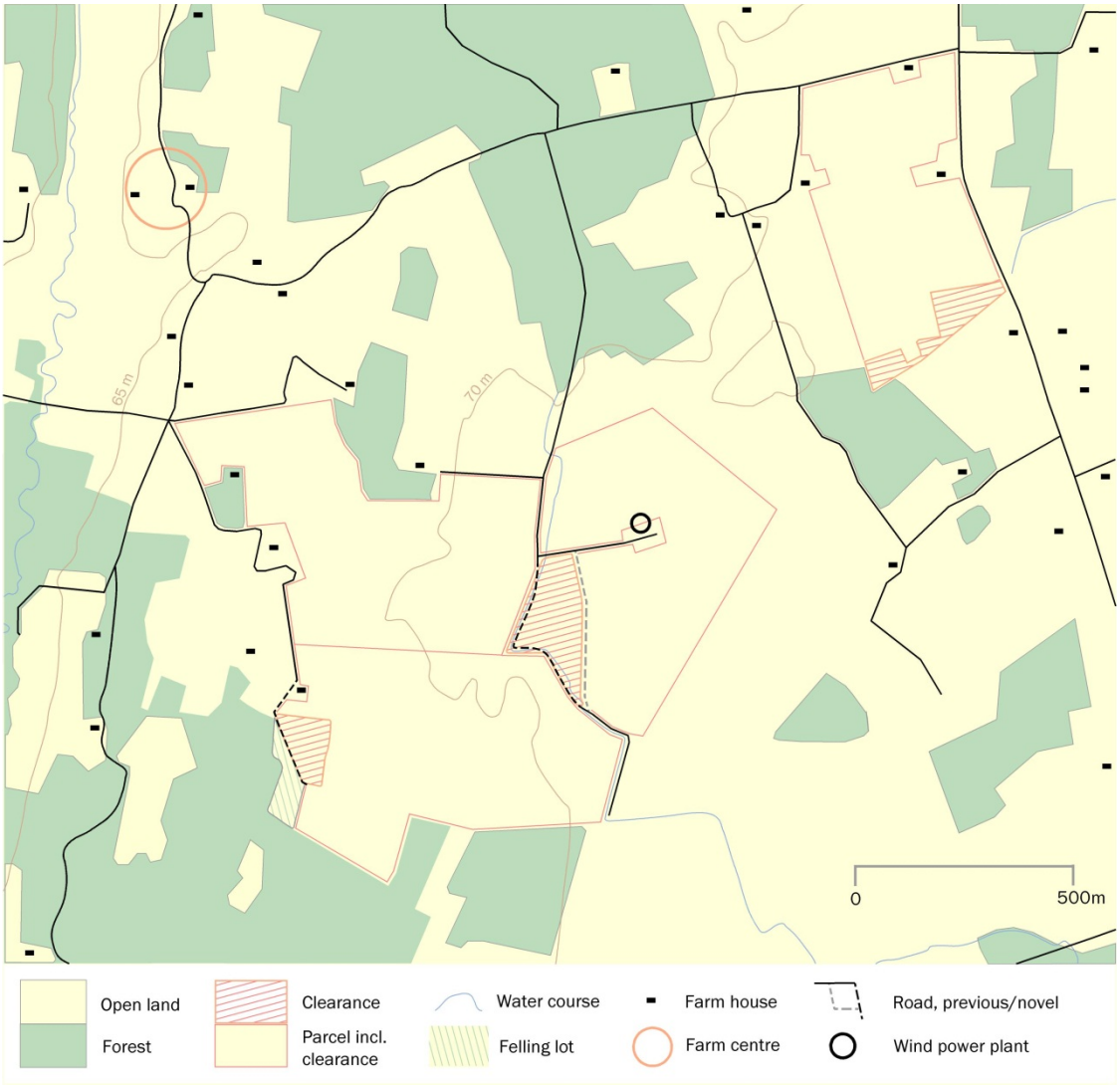
The whole map is shown on the next page (encircled farm centre).



CF 4

Farm Land Map, Farm CF 5

Farm Land Map (excerpt), Farm CF 6

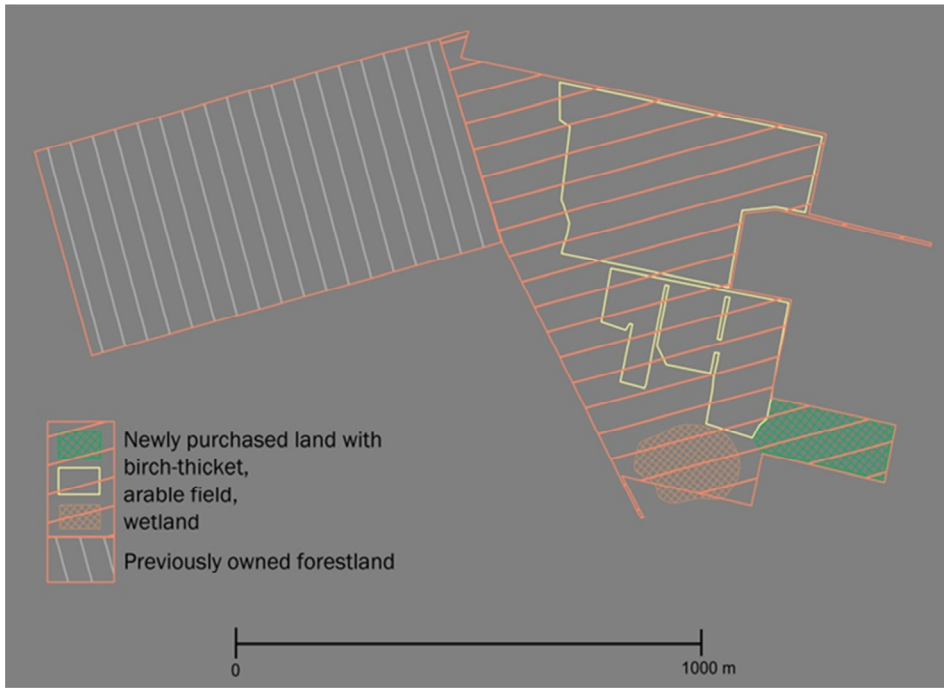


Farm Land Map, Farm CF 7

The map is drawn based on the Real Estate Map 2010, an aerial photograph, and field notes.

Excerpt Map of Newly Purchased Land and surroundings on the Farm CF 8

This map illustrates the Reworking of separated lots into a single field, too, as discussed in the chapter Tilling Work. The arable land circumscribed by a yellow line, to the right in the middle of the image, is according to the farmer's plans to be remade into one field, with subsurface drains instead of the regrowing open ditches.



Farm Land Map, Farm CF 9

Farm Land Map, Farm CF 10 (see chapter B7)

Farm Land Map, Farm CF 11

Figure 61. Clearance in a Semi-Open Landscape, Farm Example CF 7

Appendix VI. Compilation of the Study Circle Results concerning Haymaking

	Compiled results Why hay?		
Statements in Swedish	*Statements* *	*Group Answers*	*Individual Answers*
•Djuren behöver foder	Cattle need fodder	correct	yes
•Bra fodergröda	Proper fodder crop	correct	several yes, several omitted, one no
•Vall passar i bygden	Hay fits in this region	relevant	mostly yes (one no, animal husbandry)
•Vallstödet ger pengar!	Hayfields receive the subsidy	relevant	yes, somewhat more than cereals
•Vallodling ger öppna marker	Haymaking produces open lands	relevant	yes, one no
•Vall är vad som fungerar bäst här	Hay is what's best here	fairly relevant	yes
•Koma kräver bra bete	Cows demand good fodder	fairly relevant	yes
•EU's arealstöd ger pengar oavsett gröda	Area-based subsidy gives cash regardless of crop	disagreement	yes, one no
•Vall ger bra avkastning	Hay gives a good yield	disagreement	yes if new, weather/annual variation
•Vall är behöver inte brytas varje år	Hay you do not need to plough annually	disagreement	scattered answers, wild boars
•Tradition med betesvallar i bygden	Hayfields are tradition here	disagreement	several yes, several omitted, one no
•Betesvallar är vackra!	Hayfields are beautiful	disagreement	scattered answers
•Att odla vall är flexibelt	Haymaking is flexible	disagreement	several yes, several omitted, one no
•Markägaren vill att man odlar vall	Landlord wants hay	disagreement	scattered answers
•Priset på spannmål	Farmgate price for cereals	disagreement	scattered answers
•Marken måste vara vinterbevuxen	Land must be covered in winter	disagreement	both yes and no
•Vall är lättskött	Hay is easy to manage	less relevant	mostly yes, a few no, not if intensive crop
•Priset på livdjur/kött	Farmgate price for calves/beef	less relevant	several no, a few yes
•Priset på mjölk	Farmgate price for milk	less relevant	several no, a few yes
•Tidsbrist	Lack of time	not relevant	scattered answers
•Jag har ärvt marken men jobbar utanför	Inherited land, external job	not relevant	both yes and no
•Vall är enklast att sköta	Hay is the most easy to maintain	false	scattered answers
•Minst sårbart med vall	To have hay is least vulnerable	false	scattered answers
•Vall är billig att anlägga	Hay is cheap to grow	false	no
•Vall är billig att sköta	Hay is cheap to take care of	false	scattered answers

* The translation from Swedish is approximate.

Appendix VII. Interview Quotes

Quote from the Farmer Internet Forum Bukefalos

“Plöjning är bland det mest tidskrävande arbete man gör på en åker. Ofta är körhastigheten bara 3-10 km/h, men säg att ni har en 4 skärig plog som ger 2 meters arbetsbredd. Då är det ganska rimligt med 1 timme per hektar och så tillkommer vändtegarna till det sedan. Dock är det väldigt stor skillnad vilken form åkern har, en trekantig åker är ju mer tidskrävande att plöja än motsvarande yta om den är kvadratisk eller rektangulär. Det är också stor skillnad hur vändtegarna ser ut, hur det går diken etc. Det är också stor skillnad i hur marken är att plöja, är det länge sen det plöjdes sist så att det är sega grästuvor eller om det finns rötter från sly i backen så kan plöjningen lätt ta dubbelt så lång tid som om marken är regelbundet plöjd med bara några års intervall.”
Source: http://www.bukefalos.com/f/archive/index.php/t-1144435.html, last accessed 2013-02-04.

Quote from the Farmer Interview LUF 8

FARMER (HUSBAND) jag kommer från lantbruk jag också, det är bakgrunden (...)
INTERVIEWER tyckte du det var svårt här (med din uppväxtmiljö på en gård på slätten) när det var så här lite här och lite där?
FARMER (HUSBAND) nej, det ska jag inte påstå
INTERVIEWER eller det är sekretessbelagt för [din fru]...? (skratt)
FARMER (HUSBAND) nej, nej, vi har pratat om det också som sagt så att
FARMER (WIFE) det var väl att det var sämre marker, alltså inte så produktivt
FARMER (HUSBAND) som sagt
FARMER (WIFE) steniga jordar, steniga
FARMER (HUSBAND) jag har varit lite djurintresserad
FARMER (WIFE) just det
FARMER (HUSBAND) och då var det ju lämpligt för djur här, det är därför (... hörs dåligt) skulle det bli något här så fick det vara djur, att ha det som växtodling eller spannmål som på slätten det går inte här
FARMER (WIFE) det lönar sig inte
INTERVIEWER vad är det som gör att det inte lönar sig i en så’n bygd?
FARMER (HUSBAND) ja, dels avkastar det ju mycket mindre, och se’n är det ju mindre bitar och, ja, de tar längre tid att köra och vända och snurra, man kan inte rationalisera på samma sätt
(INTERVIEWER... hörs ej)
FARMER (HUSBAND) så det är mera jobb för mindre avkastning, ja det är mycket stenigt och så där också, så att det...
INTERVIEWER man får lägga ned jättemycket tid på att ta sig till de olika ställen och så får man liksom hålla på och vända
FARMER (WIFE) stora plogarna
INTERVIEWER och numera kommer man inte ens åt...
FARMER (HUSBAND) nej, visst har det blivit så att ... maskinerna är så pass stora att de inte kommer in där längre
FARMER (WIFE) nej vi har väl inte mer än en halv avkastning mot vad de har
FARMER (HUSBAND) ja, just det
FARMER (WIFE) om man jämför med slätten
FARMER (HUSBAND) ja ja
INTERVIEWER du tänker per hektar
FARMER (WIFE) ja

FARMER (HUSBAND) min bror driver ju jorden där jag är född, och det är ungefär hälften av vad han får in per hektar
INTERVIEWER och hur går det med djur i en sådan mellanbygd?
FARMER (WIFE) ja men det går ju bra
FARMER (HUSBAND) har gått
INTERVIEWER har gått, just det, tänkte just säga att förr var det ju det naturligaste men idag är det frågetecken
FARMER (HUSBAND) när vi, jag började här så var vi ju över 20 mjölkproducenter här i trakten, nu är här bara en kvar
---
INTERVIEWER hur är det med vildsvinen? Varifrån kommer dom?
FARMER (HUSBAND): Vi har dom utanför trädgården här också… Där finns fina skogar för dom, så kommer då därifrån.
INTERVIEWER Hur påverkas dom närmaste åkrarna?
FARMER (HUSBAND): Dom är överallt I princip. (…) så de har här ett bra urval [skratt].
INTERVIEWER men, det inverkar inte på vad det blir för grödor eller det inverkar lite?!
FARMER (HUSBAND): ja, det gör det ju. (…) Förra våren fick jag köra mycket och harva och jämna till, dom hade bökat upp åkrarna rejält, och stora arealer alltså, så vi sägar tur vi inte har mjölkkor längre, för då får man jord i fodret och så blir mjölken kasserat, jag tror inte vi hade klarat det under dessa förutsättningar. Dom är inte så känsliga köttdjuren…

Quote from the Farmer Interview LUF 6

INTERVIEWER Hur blir det så att du arrenderar hos någon och så har du utarrenderat ditt eget?
FARMER (HUSBAND) Jo, alltså, under min storhetstid då, som jag skriver där [i Maries anteckningar] alltså att jag gjorde bete, mer bete till djurhållningen, då arrendera' jag ju det här uppe, alltså XX som jag säger, sen arrendera' jag en gård till bete uppe i någonting som heter YY, som i princip ligger där ungefär, och ska man leva på ett jordbruk här uppe så är där inte mer än ett sätt och det är på djurhållning, och jag har under hela min tid haft för lite areal, faktiskt
FARMER (WIFE): Det svarar inte på frågan varför du har det kvar kanske… (lite prat om varann', skratt)
FARMER (HUSBAND) Jo, det har jag ju behållit för att det kan vara roligt att ha något, jag har den också kvar! Så jag sår den plus XX så jag har då 20 ha som jag sår.
INTERVIEWER: Du säger att du har haft för lite mark, har det varit svårt att få fram arrenden och med tillgång till mark?
FARMER (HUSBAND) Nja, det har liksom inte passat, det är klart, hade man en alldeles fruktansvärd jordhunger så klart man kunde skaffa mark, men sen ska det ju vara lämpligt också, det ska inte bli för tungarbetat…
INTERVIEWER: När blir det det?
FARMER (HUSBAND) Det är om du ska ha en halvmil att köra till exempel eller så, det har jag inte tyckt och jag har ju klarat mig, (…)
INTERVIEWER: …du har inte haft jordhunger, säger du, är det det som begränsar eller har det vart priset på mark eller har det varit avstånden liksom eller har det vart…??
FARMER (HUSBAND) Ja, inget att tveka på alltså… om jag bara hade haft möjligheter, så hade jag köpt mer, men det är inga hemligheter… där blev jo en fastighet ledig där, men så hade vi haft en konflikt här i byn om vägar och sån't sen lång tid tillbaka så där var det kört för min del, helt klart, det hade ju passat, det är egentligen det enda som har varit till salu, som hade vart alldeles utomordentligt lämpligt [vi letar på kartan], (…)
INTERVIEWER: Hade du varit yngre, hade du då också tänkt sluta på grund av att det inte ger så mycket?
FARMER (HUSBAND) Hade man varit yngre så hade man ju (…) man kunde ha gå upp tidigt och ha ett jobb borta.
INTERVIEWER: För här i bygden har man inte sockerbetor och potatis…?

FARMER (HUSBAND) …har man inga sockerbetor och inga potatis! och det är inte lämpligt, så här är alltså… ska man driva jordbruk här, så måste man om man nu ska så att säg leva på det så måste man ha kreatur, där är inget val
FARMER WIFE: Ska man vara riktig ärlig, om jag nu ska lägga mig i, (…), om du hade vart, när du började sälja grus, om du hade vart i den situationen idag och om du hade vart yngre, då hade du byggt ut stallen och ökat besättningen och skaffat datamjölkning och till tipp topp alltihopa och lagt gruspengarna på det, eller hur?
FARMER (HUSBAND) Jo, utan tvekan!
FARMER (WIFE): Ja, just det, just det!
FARMER (HUSBAND) Men så är dilemmat att skaffa mark…
FARMER (WIFE) …ja.
FARMER (HUSBAND) Det är ju det, det har ju hämmat mig alltid alltså… lite granna… men annars har du rätt, säkert hade jag gjort det! (…)

Quote from the Farmer Interview LUF 20

INTERVIEWER jag tänkte mest på hur man resonerar när man nu har avverkat, och då kan man ju tänka att det blir trevligare att gå i eller om man nu har den inriktningen att man ska ut med hunden i skogen eller någonting…?
FARMER (HUSBAND) men jag ser ju att i detta område har man ju inget… det tänket har man här framme kan man säga men inte här uppe utan då är det produktivt man får tänka på dom som planterade det här en gång i tiden det får vi ju glädje av idag med en bra avkastning och det går inte att jämföra björk mot gran, det är helt andra pengar, så att… ska vi göra det enkelt så ska vi bara låta det föryngra av sig själv med björk eller någonting sådant men man får ju ta ansvar för nästkommande också ju så här kan man inte tänka liksom så att… med rekreation och annat, men det är ju här framme försöker jag hålla lite öppet där (…) han planterat gran här men det kan jag inte tänka mig att göra när vi tar det utan där får det bli björk eller något sånt
INTERVIEWER där är gran idag?
FARMER (HUSBAND) där är gran, också där
INTERVIEWER är det moget?
FARMER (HUSBAND) nej, trettio år till, [längre fram i intervjun] och här nere fanns granparti som inte var färdigt, men det tog vi bort nu
INTERVIEWER i år… i vintras?
FARMER (HUSBAND) ja, bara för att vi inte tycker det passar så där tog vi bort granen
INTERVIEWER: och vad är det andra?
FARMER (HUSBAND) betesmark, och sen har vi öppnat upp hela detta här också, här va, så att här kommer också bli skogsbete kan man säga bara för att här det ska bli fint här nere
FARMER WIFE där är ju björkar i den dungen
FARMER (HUSBAND) björk lite grann, och så tog vi bort all asp, det kallas för tändstigskogen där
INTERVIEWER jag förstår…
FARMER (HUSBAND) så det har vi tagit ned alltihopa va och låta korna beta där så där ska bli liksom en björkdunge och här blir lite ekträd här nere så här blir mer öppet betesmark för här har inte varit odlat alls och här var gran också planterat
INTERVIEWER märkligt ställe att ha gran på…
FARMER (HUSBAND) jag tror att han [den tidigare ägaren] har fått… ja… han har varit förtjust i gran och fått lite plantor över och så sätter han det där
INTERVIEWER det kan ju hända… men då har [brodern som lånar betesdjur] alltså ett sammanhängande bete
FARMER (HUSBAND) ja, och vi sköter det så han bara kör dom hit och vi har sommargäster som vi kallar det
INTERVIEWER okej
FARMER (HUSBAND) kommer på våren och lämnar på hösten, vi håller efter alltihopa, ja, stängsel och skötsel och vatten så att han bara släpper dom
INTERVIEWER men då tar ni ersättningen..?
FARMER (HUSBAND) vi tar ersättningen, ja.

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