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Exploring the ‘Unknown Unknowns’ of Urban Farming

An ethnographic case study, in narrative form, on the last urban farm in Stockholm, Sweden

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Exploring the ‘Unknown Unknowns\(^1\)’ of Urban Farming;
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\(^1\) Referencing a speech given by retired U.S. Secretary of Defense, Donald Rumsfeld in 2003 regarding “the known knowns” (the issues in the world that we know of and know about), “the known unknowns” (the issues in the world we know of but do not know much about them) and “the unknown, unknowns” (the issues that we know absolutely nothing about and have no clue that we know nothing about them).
Abstract. The prediction of growing global populations flocking to cities, increasing demands for more food production, the call to maintain biodiversity and the interactions of many different stakeholders elicits quite a mind-boggling medley of complexity. The act of 'urban farming' may be a promising starting point in which to begin understanding this complexity. This thesis strives to untangle the variables within this prediction through a narrative approach, weaving in relationships of power in order to understand the complexity of this 'mess,' by tracing the actions of the last urban farmers in Stockholm, Sweden. Employing Complexity Thinking, the narrative is temporally organized in order to highlight context, purpose and motive, aiming to promote verisimilitude through systematically assembling interpretations while supporting them with thick details as to what 'urban farming' interpretively is. Discrepancies, connections and contradictions from the case study are juxtaposed against one another to display plurality of views across different scales of space and time. The case study highlights urban farming's marginalization by illustrating historically distinct institutional shifts in governance; drawing attention to policies and regulations, past actions and artifacts, which, when self-organized to the present, are 'currently' reducing the farmers' possibilities for food production, promoting instead, an arguably beautiful, yet 'unsustainable' biodiversity-and-urban-park emphasis, ignoring the appetites of the city's rapidly growing population and the accompanying external food dependencies that grow with it. Conclusions point to a deeper seeded issue in the founding assumption of the scientific prediction, calling attention to contextuality, unpredictability, the problems associated with a governing logic and/or a compressed-way-of-thinking and the general need or willingness to appreciate the complexity of things, actions and people – particularly people who grow or raise our food.
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Special literary thanks to those not included but who have inspired me – Donna Haraway, Jon Kabat-Zinn, Augusto Boal, Tom Waits and Henry David Thoreau.
Disclaimer – #1 - In the late 80s my father, a physician, once made a reflection out loud, “if all the organs in a human body are in healthy condition, a human is probably valued around $130,000.” My mother, also a physician, taking my presence into account (as well as the danger in my sense of ‘awe’ by my father's comment), quickly smiled at me and hugged me retorting, “I think all humans are priceless.” This of course had my father realizing his verbal faux pas, that of marginalizing the complexities of human life, prompting an expeditious agreement with my mother. Growing up with three adopted sisters, I know that my father does not truly marginalize the preciousness of human life. But under our current culture of commodification and capitalization, it is often easy to find oneself “not taking one's presence (‘actions' or 'things') into account.” Frequently we find ourselves playing the reductionist and quantitatively calculating that which cannot be put into numbers.

#2 - Along these lines, I must acknowledge the number of words I have chosen to incorporate in this thesis. A large segment was incorporated in order to elaborate on the methodological process (and can be found in the Appendix Section). It is not that I believe I deserve any special entitlement but what I have chosen to incorporate or leave out has come with a painstaking process of reflection. Thus, I take full responsibility for what has been incorporated, have strived to make it interesting to the reader (so that people would want to read it) and will accept any repercussions.

"Turn him to any cause of policy,  
The Gordian Knot of it he will unloose,  
Familiar as his garter"

-Shakespeare (Henry V. Act 1, Scene 1. 45-47)

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2 Taking note from Latour (2005)
Chapter 1: Feeding the Urban Appetite

“For every complex problem, there is a solution that is simple, neat, and wrong.” - H.L. Mencken, (from "The Divine Afflatus" in New York Evening Mail (16 November 1917))

“It is constituted as mess, like the plants that are turned into weeds by virtue of the invention of gardening. Perhaps, then, mess is like invisible work except that it isn’t invisible. Instead it simply doesn’t fit: it flows around and exceeds the limits...” (Law & Singleton 2004)

Problem statement:

Producing food, maintaining biodiversity and feeding the growing global populations of people, living in and moving to cities, currently estimated above 50% and predicted to rise to 80% by 2050, is and will continue to be, a concern for policy makers, ecologists, farmers and many other stakeholders (Porter et. al. 2010, Chappell & LaValle 2009, MEA 2005, Ehrlich & Ehrlich 2008, Grove 2009, Pimm et al. 1995, Gaston & Fuller 2007, UNMP 2005; FAO 2006).

Arguably, the bigger picture is even more ‘messy’ and ‘complex’ than this. But, if we so choose to comprehend and agree that this is a concern, where should we begin to address it? Perhaps the best place to begin is with the acceptance of its complexity. Regardless of whether or not you agree to the full extent that we need to produce more food, maintain biodiversity, accommodate growing cities and juggle all the stakeholders who, statistically seem to be flocking to urban centers - there is still complexity to your reasoning. Even if we play the devil’s advocate, there is a portion of the concern that may be difficult to ignore, that food and people are inextricably linked. The exact amount of required food may be left open for debate but most of us are reminded, multiple times throughout our day, of this needed link.

Though, if we are going to make exceptions, then biodiversity cannot be ignored
either. That is to say, if all of the biologically diverse foods we relied on for survival suddenly went extinct or became inaccessible\(^3\) we would be in the same situation of *starvation*. Biodiversity *is* food. Again, the exact amount of edible biodiversity we require may be left open for debate (but even *this* is debatable).

'Cities' on the other hand, appear less 'concrete' as a necessity for our survival. The nomadic longevity of our paleolithic 'hunter-gatherer' ancestors brings into question our particular *requirement* for cities, let alone our reasons to move to them. This is not to say that we should ignore more than half of the global human population who currently reside in cities, or the many more who are flocking to them, quite the contrary! I believe there are very good reasons behind the actions that have been taken.

My logic here is, if we are choosing to address the concern above, we should probably make sure that this concern is not just an assumption based on an prediction that may or *may not* be taking the *longue durée* of *everything* into account (Braudel 1980). Perhaps the concern can be partially unravelled if we are able to understand what a city *is*, how we have come to define a city, or better yet, how a city has come to be defined.

**'Urban'**

Different people have defined the origin of a city differently. Lewis Mumford (1961) believed that the *idea* of a 'city' began to formulate with the ability for people to be sedentary and build permanent housing. However, he noted that the ability to actualize this idea did not really take form until the Neolithic agricultural revolution, which allowed for the long term security of food in a stationary location. He also notes that early villages in the pre-industrial era had more of a “symbiotic relationship with the natural environment” and that the criteria we might use to define a city today would be very different from the criteria in the pre-industrial era. Jane Jacobs (1969), declared that cities had come into fruition before agriculture had ever been developed. This is to say, she defined *a city* as the first conglomeration of people living together in stationary

\(^3\) in the same way that potato blight created famine in Ireland (Salaman 1985)
trading posts.

Whether agriculture came first and the growth of a 'city' followed (along the lines of Mumford's explanation) or a 'city' came first and agriculture followed (Jacob's explanation) - **one needed the other for its growth and/or survival.** Without some direct and/or continual supply of food – grown within, nearby or traded from afar (but never without) - a 'city' would eventually cease to exist. This is not to say that other variables could make a city 'cease to exist' or significantly reduced a city's population (i.e. marauding armies, disease, loss of a water source etc.).

Tsing (2010), following Mumford's 'long term security of food' lead, mused that agriculture, specifically in association with the maintenance and extension of cereal crop farming, expanded easily (and continues to expand) under the “emergence,” and support, “of social hierarchies – and the rise of the state.” City/state empires like Ancient Athens4 and Ancient Rome5 were not only known for spreading agriculture as a means of food production, along their dominating war path, but were known for enslaving those in which they conquered to grow cereal grains for them (Hopkins 1978, Jameson 1977/1998). Somebody was always better off, which required somebody else to be less better off. As Tsing continued, “intensive cereal agriculture can do one thing better than other forms of subsistence: support elites.”

This is not to say that the rise of the state or the supporting of elites equates to the creation and growth of a city - people in power can just as easily oppress others on a plantation or a farm. Though, without the 'emergence of social hierarchies – and the rise of the state' to enforce the continuation of cereal grain agriculture, a city could not comfortably feed itself for long. Unless, that is, a city was built to be self sufficient or a

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4 The Natural History Museum of London (2011), “Greek grain colonies in the black earth of southern Russia had fed cities like Athens since 550 BC...Only by importing wheat could ancient mainland Greece support an estimated 2 million people...”
5 The Natural History Museum of London (2011), “The huge Imperial City of Rome (population 1 million) became dependent upon imported wheat, much of it from Egypt.”
6 Björkland (2010) notes partial self-sufficiency in Swedish towns and cities but highlights the manipulative hand of the Swedish Crown (tying in urban land ownership and nobility) in the relationship regarding the doubling of urban populations in Swedish cities between 1830-1870 and its connection to the rising popularity of the potato and how this was due to the increasing cost of rye. First, pointing out what we think of as 'urban' is quite different from what it was using an example from Lilja (1995) in that the registered Swedish urban household of 1620 accommodated an average of 2.5 cattle. She then estimated that 60-70% of all food was grown in most Swedish cities by the city dwellers up until the 1870s (when Sweden's industrial revolution was taking off) and that a large
city prepared itself for 'crises' it may experience (leading to concepts like 'urban food security').

But the word, 'crisis,' designates a temporal period of time, a prescribed imbalance from an established norm. Once a 'crisis' ends (from the perspective of those calling it a 'crisis'), would this mean that consumptive and/or hegemonic imbalances could resume as they once were, before the crisis (and/or continue to grow)? That is, when a city is not under crisis, would this mean that everything outside of a city structure was under 'crisis' (from, say, grain-fed marauding armies, exploitive taxation, commodified forestry management and political regulations)? The question then becomes, who is under 'crisis' and how might have this crisis-relationship developed?

As victors have written the history of those they have conquered, my premise here is to present different sides of the same story, particularly with regard to the dynamic relationship of power. Foucault (1982) noted that, “a society without power relations can only be an abstraction.” What defines a relationship of power? 'Power,' is a “mode of action... that acts upon an action.” That is, the exercising “of power is a way in which certain actions may structure the field of other possible actions.” For example, a city/state roman emperor, obviously of a distinct social hierarchical class, could enforce his new slaves to grow grains through the action of hiring a slave driver who physically enforced the activity of labor from the slaves. There are multiple power relationships in this example. Arguably, the relationships portrayed, from emperor to slave, are representing a top-down, imbalanced power relationship. This is not to say that slaves could not also exude power from the bottom-up (power could be actively expressed through a slave uprising, trying to siege the city of Rome, yet, being called a 'marauding army' by the

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portion of the food that fed the cities was in the form of grain (primarily rye) until the 1820s. She makes this argument because the Swedish crown left meticulous records from this period as to the number of barrels of grains that each citizen owed to the crown. Grains were the taxes that fed the military. And unlike grain crops, the potato was not easily transported into the city due to its mass. However, with the rising prices of grain in 1820, interest in the potato grew because potatoes produced twice as many calories in energy within the same geophysical space as cultivated rye. Björklund argued that this made the potato the perfect 'urban food.' As the geophysical space of an 'urban' area is highly valued, the potato made sense for the urban context. As the crown still required taxes in rye, the number of children could increase, fed on potatoes grown in cities, in order to grow the rye, demanded by the Swedish Crown - leading to the population of Swedish cities to double.

7 See Ljungkvist et. al., 2010
8 Similar to the way in which Howard Zinn (1980) opened the first chapter of his book, "The People's History of the United States."
nobility residing in the city).

Dynamic imbalances of power, prevalent in all cities hosting a sedentary society, is one of the reasons for why I am hesitant to accept the concern above without further inquiry. That these variables (biodiversity maintenance, feeding people moving to cities, producing food) 'will continue to be a concern,' up until 2050 without first asking - who is concerned? Some people may not be concerned at all! A continual migration of people to cities could very well exacerbate further social inequalities, resource/energy imbalances, biodiversity loss, future 'urban food security crises' and many other unpredictable complex 'concerns,' other than those listed above. Who is to say that a different path may or may not emerge before the global population of urban dwellers reaches 80%?

Allow me to ask a more cautious question; with what we know about the relationship between cities and food, or more specifically – with what I do not know about cities and food - how do we begin to understand whether or not this is a concern I want to address? Seeing as people are predicted to move into cities, they are predicted to continue to eat food and I currently live in a city, perhaps the best geophysical place for me to start understanding the complexity of this concern is by following Marston’s (2005) call to “focus on the ‘local’ as an entry point to understanding ‘broader’ processes.”

The nearest connection to the nearest source of food (to my knowledge) in my local vicinity is the last 'urban farm' in Stockholm, Sweden. The concept urban farm (or urban agriculture, to be used interchangeably in this thesis) has been defined by some scholars as the act of growing, farming and distributing food in or around a town, village or urban/city region (Bailkey, M. and J. Nasr. 2000). However, with regard to Foucault's (1982) definition of 'power relations,' I will place my focus more on the the relationships, functions or actions associated with the verb; 'urban farming,'
Thesis Aim

In light of the above, this study aims to;

First, explore and interpret how 'urban farming' operates through an ethnographic case study on the last urban farm in Stockholm, Sweden.

Second, from this interpretation, give a narrative description of 'urban farming,' illustrating what 'urban farming' entails, in Stockholm, Sweden.

Third, throughout this description, highlight emergent connections and contradictions relating to the concern(s) (growing more food, maintaining biodiversity, feeding the growing migration of people in cities, interacting stakeholders and also distinct relations of power) as they emerge throughout the course of the case study.

Fourth, layer these connections and contradictions with further understanding and assemble new insights into the temporality of the narrative.

Fifth, give a panoramic view of the emergent connections and contradictions by way of an assessment of the problem statement, review how imbalances of power may or may not be woven into the actions of 'urban farming' and offer any possible considerations (if there are any).

Though, before I proceed any further, I have yet to explain why I have chosen to address these topics and concerns. That is, I have yet to provide reasons for why I aim interested in studying 'urban farming.' I think it would prove helpful to understand these personal motivations first.

Motivation

My interest in urban farms began with the understanding of my need (and hunger) for food. My fascination with food developed through many avenues; my previous
research and study in health psychology, the physiological connections of food to fitness/dance/theater/performance and mood, environmental law in Washington State as well as E.C. Law (European Commission, but primarily in regards to Swedish policies), corporate social responsibility and the production and marketing of food in the U.S. and Europe and research covering our 'Planetary Boundaries' at the Stockholm Resilience Centre. But before I came to Sweden, I had begun a very successful collaboration with local 'urban' farmers (through a Community Supported Agriculture) who provided amazing food for myself and my health, fitness & well-being 'lifestyle' business in Seattle, WA.

While running my 'lifestyle' business I was continually searching for deeper understanding with regard to the physiological, as well as philosophical, elements that promoted greater well-being. The more I dug for understanding, the more I found myself drawn to, what I now believe to be one of the most highly correlated variable for human well-being: food. However, I was drawn not only to food’s relationship with biophysical performance, but food’s interlinking cultural, traditional and societal values throughout society's history – they could not and cannot be ignored. I was drawn towards how these values have connected to the ‘well-being’ of the human experience. Living most of my life in a 'concrete jungle,' I found myself drawn to the relationship of cities and food, (or the frequently ignored relationship) (Mumford 1961, Steel 2009, Pollan 2006). Thus, when given the opportunity, I was drawn to my nearest 'urban farm.'

Chapter 2: How to Understand the Urban Appetite

“...the issue is not the imposition of a question but the growing awareness of a problem, an ‘awareness’ that may have been provoked, but was not imposed, and thus can easily be denied by those who fail to see the point of it.” - Isabella Stengers (2005)

This thesis does not have a scientific question, per se. However, many 'scientific' questions were addressed throughout the course of the study. The reason for not addressing a scientific question has been my individual choice; partially due to the theory
and theoretical framework (elaborated on shortly), partially due to my belief that there is always another side or different perspective that should not be neglected and also because I think that complexity, *itself*, is continuously influx, without boundaries, never completely predictable and should remain as open as possible to all scientific or non-scientific questions, interpretations and understandings. In this regard, I *do* realize and must accept that this thesis itself poses as a 'closed system,' there is a beginning and an end. But I do not believe my inquisition to understand these topics will come to a full stop directly after I have completed and turned in this report.

**Emergent Design**

“The differentiation of science is both an answer to the growing complexity of the world and in itself a source of new complexity” (Alrøe, 2010).

With the 'scientific' questions that *were* asked, data was collected and analyzed, new questions emerged with new understanding and insight, further data was collected and analyzed, previous questions were *re*-addressed, *goals changed* and the process repeated in a recursive and iterative pattern until deadlines were nigh. This qualitative, data-gathering pattern is often called *Emergent Design* because, unlike any quantitative 'fixed' or 'linear' approach (as well as most qualitative approaches), research procedures and questions in the field can be adjusted with emerging interpretations (Morgan 2007). Though, as Morgan (2007) has used an anthropological ethnography as a helpful illustration of *Emergent Design*, this data gathering-pattern and presentation could also be considered an ethnography (admittedly, it did not begin as such).

In an ethnographic approach, “the goal is to build patterns of many interacting things that *include* what was noticed, not to *isolate* what one was *supposed* to notice and *measure* it” (Agar 2004). However, I did not restrict myself from measuring isolated patterns *or* building patterns from what was noticed. The method to this thesis is embedded somewhere in between an ethnography and a hard science report, numbers were crunched but the rationality of the number crunching was left open for inquisition
and new interpretations.

**Outline of Thesis**

The written format of this thesis *does not* follow an emergent design, for it would be far too long (as you can see from my first-person account of the chronologically organized applied theory(s) & methodology(s) found in Appendix 1). The thesis begins, or is arranged, primarily under the outline of a scientific report (i.e. introduction, aim, theory, methods...) but ends with an 'assemblage' of the methodology/results/discussion/panoramic view. More specifically, the second to last chapter consists of a narrative that elaborates on “what one was supposed to notice” as well as “patterns of many interacting things that include what was noticed” and ends, with the final chapter, giving a panoramic view assessing the problem statement.

The analytical choice for this form of organization is due partially to the theoretical framework defined in a narrative approach (described below), but also my own intent and motivation for relevance and understanding between the sciences. That is, as Crumley (2003) quoted Snow (1959) with her own desire to “bridge the gulf dividing the 'two cultures'” (referring to the physical and biological sciences as one culture and the social sciences with the arts and humanities as the other culture), I also would like to bridge the two cultures by utilizing aspects from both sides and placing the organization and design of this study “between things” (Latour 2005).

**Complexity Theory**

“If we allow different methods, we should allow them without granting a higher status to some of them. Thus, we need both mathematical equations and narrative descriptions. Perhaps one is more appropriate than the other under certain circumstances, but one should not be seen as more scientific than the other.” (Richardson and Cilliers 2001)

This thesis is explorative in that it strives to “arouse a slightly different awareness of the problems and situations mobilizing us” (Stengers 2005a:994 via Whatmore 2009), particularly through the emergent platforms of complex interdisciplinary and

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9 In Bruno Latour's sense of the meaning (2005)
transdisciplinary research approaches. Due to the complexity of the process, the many different emergent bifurcating pathways followed and the continual feedbacks that dialectically changed the inquiry and interpretation, the theory chosen to be employed in this thesis is Complexity Theory/Thinking (to which all other applicable theories can be held under the auspices of Appendix 1).

A substantial amount of literature has been written about the interdisciplinary science and philosophical approaches regarding complexity (Prigogine & Stengers 1984; Anderson et al. 1988; Nicolis and Prigogine 1989; Lewin 1992; Waldrop 1992; Kauffman 1993; Mainzer 1994; Casti 1994; Bar-Yam 1997; Cilliers 1998, Richardson & Cilliers 2001). There may never be full agreement as to how one should apply complexity theory as some have even refused to call it a theory and prefer to call it 'complexity thinking,' as philosopher Richardson (2005) and mathematician Mainzer (1997) have emphasized. This is because it does not have to be considered a theory in which to 'prove' something, but more of a logic in which to 'probe' (Dole 2007). The logic, thinking or theory, is concerned with revealing patterns, or better yet, combinations of meta-patterns in order to understand the complexity of systems in focus (Dole 2007). Some features of complexity have been agreed upon (Listed below under Features of Complex Systems), but are still up for open debate (Richardson 2005).

**Literature Review on Complexity Theory**

Complexity theory emerged from Chaos & Complexity Theory, supposedly founded by the French mathematician Henri Poincaré (1952) (though arguably established in philosophy and anthropology under a different name long before its arrival to the hard sciences) and has been outlined and employed by a plethora of very different scientific and philosophical disciplines (Hayles (1991), as well as the references in the paragraph above). Maguire et al. (2006) notes that both objective and interpretive (or subjective) perspectives are involved in the interdisciplinary emergence of complexity theory. Boisot and Child (1999) suggest that the different complexity approaches can best be conceptualized as reduction and absorption strategies. That is, objectivists reduce
complexity (often considered a quantitative research method) and prefer modeling complexity, while interpretivists absorb complexity (often considered a qualitative research method) and prefer to explore meanings and the promotion of descriptive metaphors detailing complexity (see figure 1, to be read from the bottom-up). Though Maguire & McKelvey (1999) point out, that the distinctions between the two approaches are not always decipherable.

![Diagram](image)

**Figure 1: A map of the field of complexity science and organizational studies (from Maguire et al. 2006)**

Complexity theory/thinking leaves 'open' many possibilities of inquiry and design. Following Maguire's & McKelvey's (1999) point, approaches taken to understand complexity are not restricted to the use or incorporation of both qualitative and quantitative methods as part of a complexity thinking approach (Dole 2007). Though, by assembling and presenting data gathered through complexity theory, methodologies can often be intrinsically conflicting. The limitations of presenting complexity theory are pointed out by an adaptation of David Harvey and Michael Reed (figure 2 – taken from Elliot and Kiel (1997)).
Under **figure 2** (which, by most complexity theorists, would still be considered limiting in the actualized possibilities of research methods for complexity theory), the analysis of the case study in this thesis follows a chronological pattern that began on the left, employing the use of predictive modeling, and ended, with the help of *emergent design*, on the right with a historical (yet viably deconstructive, at times) non-linear narrative incorporating earlier predictive models. This layering of patterns (i.e. from predictive models) and connections in the presentation of this thesis acts as a mini-representation of the features found in a complex system (however, closed it may be).

**Features of Complex Systems**
A complex system is an open, whole system made up of a seemingly (and possibly) unlimited number of variables and parts, all independently, or dependently, dynamically interacting by (possible) rules or forces that coordinate interactions with other parts (Maguire et al., 2006). These interactions are often considered self-organizing or chaotic, being highly sensitive (or chaotic) to micro scale interactions or disturbances that affect macro scale interactions and yet are simultaneously robust and 'self-organizing' against macro-scale disturbances (Richardson et. al. 2000). The reference of Lorenz's (1963) butterfly effect has often been used to explain a complex system's sensitivity. That is, when a butterfly flaps its wings, it has the possibility of triggering extreme weather patterns on the other side of the planet. The robustness or 'resilience' (see Appendix 1) of a complex system can be seen in the system's ability to self-organize or recover, after the extreme weather patterns, self-organizing back into (almost) the same functioning system before the extreme weather occurred (Maguire et al., 2006).

When parts of a system contextually interact in parallel with other parts, non-predictive emergent patterns, properties or phenomena can be recognized often at the

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**Features of Complex Systems (Cilliers 1998, Richardson 2005, Maguire et al., 2006)**

1) Complex systems are open systems that are incompressible (in behavioral terms, not necessarily compositional).
2) Complex systems are systems that consist of a large number of elements.
3) The elements in complex systems interact dynamically with feedback loops and unpredictable, emergent outcomes.
4) Interactions are rich; any element in the system can influence or be influenced by any other.
5) Interactions are non-linear and operate under conditions far from equilibrium.
6) Complex systems have histories (or system memory) which can act at micro and macroscopic scales.
7) Complex systems are fractals: irregular forms of scale dependence.
global/macro scale (Maguire et al., 2006). Many of these emergent patterns are revealed through non-linear, self-organizing feedback loops. The word ‘feedback,’ requires a certain level of non-linear cycling back, carrying a temporal and spatial component. Thus, to begin realizing the non-predictive emergent patterns of self-organizing feedback loops, there must be a place (space component) in which to cycle back into (time component) with a history, or system memory in which to compare, or refer back to, in order to conclude that a feedback has occurred. This history can help to describe the “state of the system as well as affect the system's evolution” (Uden 2001).

That is, the past can help us understand current and future complexity but this does not mean, in any way, that the past will necessarily define the future, or even the present. For each person's perspective of the present is perhaps slightly or vastly, but always uniquely, different from another's perspective.

### Theoretical Framework

*Objectivist or Interpretivist (or both)*

“Man imposes paradigms onto the world to make it comprehensible.” (Uden et al. 2001)

This thesis began under the designated scientific approach of Ground Theory (which is elaborated on in full under Appendix 1) but has incorporated a more interpretive, ethnographic and post-structural approach offering; “an ironic combination of the poststructural and the scientific, a framework that accepts the heresy of researcher influence but then deals with it in a systematic fashion” (Agar 2004). Post-structuralism, broadly speaking, is concerned with multiplicity of meaning while acknowledging the self as a collaborating entity and sees positivist and structuralist methods as “historically situated interpretations that come laden with their own personal limitations,” (Murdoch,
That is, a post-structuralist approach does not assume a universal 'truth', as do many positivist and structuralist methods (and in my case, will choose not to deny its possibility – but it is not a 'given').

Due to this approach, I have chosen to not follow an objective, scientific method or framework (as seen on the right side of figure 1) but to incorporate scientific methodologies and follow a more interpretive, ethnographic approach (following the left side of figure 1). This is due to my concurrence with the complexity thinker and philosopher Richardson (2005) in that, “the application of scientific method makes clear assumptions about the ontological status of boundaries that I believe cannot always be supported,” particularly within the (quasi-)definitive 'openness' of complex systems, “... science was designed to study observable material entities that can easily be located in time and space, there are subjects beyond the proper realm of science” (emphasis added). With this in mind, I do not want to limit these possibilities of representation under the scientific method.

If complex systems are open systems, the act of building and creating a model entails a preconceived 'fixing' or generalized boundary thus closing off the openness and limiting and/or reducing the complexity of the system in focus. “There is no accurate (or rather, perfect) representation of the system which is simpler than the system itself” (Cilliers 2005). The scientific modeling approach, even under complexity theory, is limited to imperfect generalizations, tacit justification and requires consistency and non-contradictions (Tsoukas & Hatch 2001). This is not the case for a post-structurally tilted narrative mode (Appendix 4, table taken from Bruner 1986).

According to Cilliers (1998), it is realistically an analytical choice to delimit the boundary of a complex system. This choice is determined by the perspective, position and purpose of the person or people who have chosen to describe it. Hence, all scientific and non-scientific approaches must reduce or compress the 'incompressibility' of a system's complexity but it becomes an analytical choice by the author to acknowledge these self-imposed (or institutionally-imposed) boundaries, which leads us to the approach chosen for this thesis.
Building a Case for the Interpretive Narrative

As mentioned under figure 2, this thesis began by modeling predictions but, through emergent design, has morphed into a (historical) narrative approach. A narrative structure is a sequence of events or plot, in literary terminology (Czarniawska 1997a, 1997b, 1998). This approach allows for the incorporation of the author's actions, as well as the use of previously created predictive models thus illustrating and compensating “for limitations of traditional hard science research... generating new insight into complexity that addresses, in particular, temporal sensitivity, contextuality10, reflexivity and purpose” (Maguire et al., 2006; Tsoukas & Hatch 2001).

In order to compensate for the limitations of traditional hard science research, Tsoukas & Hatch (2001) as well as Maguire et al. (2006) have recommended the application of complexity theory to the process of translation and organization. That is, the features of a complex system described by complexity theory (non-linearity, scale dependence, recursiveness/feedbacks, sensitivity to initial conditions and emergence) should be applied to the process of writing a scientific report in the form of a narrative mode and thus provide a 'thicker description' (Geertz 1973) of the system's complexity. They believe that this approach would fill a missing gap in complexity theory design and the sciences (figure 3).

Figure 3: Framing the Interpretive approach to complexity theory

Reflexivity, Translation and 'Thick Description' of Complexity

Reflexivity is significant, especially for the scientific research, because it allows the researcher to be consistently self-critical of the “cause and effect” in the methods he or she employs (Chia, 1996; Cooper & Burrell, 1988; Giddens, 1991; Woolgar, 1988; Latour 2005). Choices and decisions are always made during the process of designing a study. Without the acknowledgement or reflexivity in any scientific approach, the scientist or researcher has subjectively chosen to ignore the very foundation or ontological assumptions made at the begin and during the process of designing and organizing the study. By employing reflexivity, purpose and intent are no longer limiting factors in the scientific process but transparent contributions in how data is collected, analyzed and translated.

Within the past two centuries the process of semiotics11, or the translation of information and data itself, has been more prominently acknowledged (somewhat credited to the employment of reflexivity in the social sciences) as a variable in the process of research that the sciences can no longer ignore, particularly under the ideals of objectivity (with emphasis often placed on the politics behind it) (Law 2004, Whatmore 2006, Mol 2007, Stengers 1998, Bateson 1979, Weick 1979; Pierce 1908, Latour 2005). The translation of data and information, as well as the choice and mode of presentation, are key component in order to understand 1) what complexity is (or what it means) within the complex system in focus, and 2) perhaps more specifically, to whom.

The translation process entangles aspects of temporal sensitivity and contextuality. It was not as if the world was any less complex three centuries ago but our interpretation of the complexity in how the world functioned, and functions currently, has changed over time and is perhaps perceived as being more complex. As Tsoukas & Hatch (2001) and Latour (2005) have noted, the translation of data, information and analysis itself constitutes interpretive design and is revealed as a particular type of narration, though may not be recognized as a narration by the contextual perspective of its scientific author. (For an example of a semiotic translation of the word and actions of a 'cow' see

11 Peirce (1908) The interpretive process (and study) of symbols or signs and their different meanings
Appendix 4)

The Second Orders of Complexity

According to Tsoukas & Hatch (2001) there are two orders of complexity to the creation of a narration; 1) the combination of these different descriptions and/or different perspectives (i.e. my view, farmer's view, ecologist's view etc.), giving us a better understanding of the complexity of whatever 'it' is (called the “first order of complexity”) and then 2) structuring our own complex narration of the emergent connections beyond the scope of the first order, by pulling in further understanding from outside of the “first order of complexity” and revealing those connections so that the complexity of the system may be better understood. Eventually creating what Tsoukas & Hatch (2001) have called a “second order of complexity”.

By examining semiotics, Noe et. al., (2007), through Bateson (1979), has identified this 'second order' as, “the cognized difference at different logical levels.” In a visual sense, we could add multiple beams of light to illuminate an image, but we begin to realize that there are, not only differences in how the light shines on the image but, that there are invisible dimension between all of the beams of light that we cannot see, even though we know that they are there (Maruyama 1978, 1985, 1995, 2004); the “unknown, unknowns” become “known unknowns.” That is, we now realize that there are different ways in which to interpret the same thing (by its actions) and we now know (the known) that we have an impossibly long process ahead of us if we were to even try to accumulate all of the interpretations (the unknowns). But what if the image (i.e. cow) moves away from the multiple beams of light (as cows are not likely to stand still forever)? Here we see the importance of space and time, the space in which the beams of light are 'fixed' and shining, as well as the time it takes for the image (or cow) to move itself outside of, or away from, the 'fixed' beams of light.

This leads to yet another understanding - the more we begin to realize what is
going on, the more we realize how large and limitless the list of 'unknown unknowns,' or 'complexity' has grown and continues to grow. According to Maruyama's visual, it seems to him that the differences between the beams lights are what “render the most comprehensive and meaningful understanding of the object.” i.e. the differences between different perspectives (a farmer's perspective, an ecologist's perspective, a sociologist's perspective, an archeologist's perspective, etc.) regarding the functioning of 'urban farming' will produce the most meaningful understanding of 'urban farming.' This however, does not mean that all of the perspectives or understanding needs to be (or ought to be) shared in a thesis.

**Narrative Mode**

A narrative mode is merely one way in which to consolidate and present complexity. According to Genette (1980) this can be three different things: the the spoken or written statement, events that occur and how they tie into subjects of the narrative (Genette titles this 'the story'), or narrating as an action. When the written or spoken statement are placed together with the story, interpretation and context become prominent. Of course, by taking a narrative approach I am then accepting the assumption that “the features of complexity are descriptions and interpretations assigned by complex observers to systems whose existence itself is a matter of definitional agreement” (Tsoukas & Hatch 2001).

As a narrator, it becomes my task to first consolidate and then organize information in a meaningful way that, to my knowledge, best represents the complexity of the system in focus. “The complexity of a system, as seen by an observer, is directly proportional to the number of in-equivalent descriptions of the system that the observer can generate” (Casti, 1986, 1994 via Tsoukas & Hatch 2001). The more in-equivalent points of view, the more complex the system will appear to be (Tsoukas & Hatch 2001). The goal however, is not to confuse the reader with complex jargon but to expand “the focus from the system itself (first-order complexity) to also include those who describe the system as complex (second-order complexity) exposing the interpretive-cum-narrative dimensions of complexity” (Tsoukas & Hatch 2001).
Polkinghorne (1988) elaborated, “The narrative scheme serves as a lens through which the apparently independent and disconnected elements of existence are seen as related parts of a whole.” It is as if multiple (and highly different) perspectives and information are consolidated, over the same period of time and space, and are folded on top of one another in order to generate greater understanding of the whole.

This process of folding and then generating understanding in the form of a narrative is not an easy task. As Ricoeur (1984) puts it, “narrative discourse does not simply reflect or passively register a world already made; it works up the material in perception and reflection, fashions it, and creates something new, in precisely the same way that human agents by their actions fashion distinctive forms of historical life out of the world they inherit as their past.”

Narration with Complexity Theory

Tsoukas & Hatch (2001) suggest that under complexity theory, a second-order of complexity would require a confrontation with our own complexity in the field as well as during the process of writing about the complexity.

“Because a reflexive narrator does not balk at entering the domain of explicating and commenting upon meaning and interpretation, such narrative positioning should help complexity researchers to reflect critically on the features they attribute to systems and expose the purposes and motivations that link them to the systems they seek to address (e.g. the desire for predictability).”

Contributions

As was mentioned earlier in this chapter, my intention is to place my research 'between things,' the 'hard' science, the 'soft' science as well as the 'non' science. As I believe that the scientific method is constrictive in both organization and presentation, my hope is that this narrative approach will offer a combination of complex presentation based elements that are normally not found within a scientific report – particularly a greater need for the presentation of contexuality, temporality, purpose, motive and
emotional fluidity that expresses more of the (quasi-)reality of the 'scientific' author's context.

Chapter 3: Assembling the Narrative

Due to the time sensitivity of a narrative approach, my own presence, as well as purpose and motive, are embedded within the context and a large portion of the methodology is assembled into the narrative itself, calibrated with temporality. I must repeat myself because this approach directly contrasts with the common practice of a 'methods section' in a scientific papers, the methods and practices of participatory observation, that led to emergent insights, are included in the narrative itself.

However, before the narrative was assembled, data was sorted and organized in different ways for my own understanding. (Again,) Full details of the first person, methodological process; i.e. interviews, data collection, analysis etc. can be found in the Appendix 1. Below is a brief outline of the data collection, organization and analysis along with my views on the limitations, boundaries and a critical reflection on methods and data.
Brief Outline of Methods

My perception and understanding changed significantly throughout my fieldwork and analysis. This had largely to do with my own curiosity and the emergent design process, coupled with the open-axial coding process from Grounded Theory I had begun with when I had started my fieldwork. Open-axial coding is a process of first coding information or text into names or themes in a way that stores information (figure 4) and later cross-compares these original names or themes, as well as topics that may overlap in other categories (figure 5) (Strauss & Corbin 1990). Thus actions, comments and observations, that were recorded during the fieldwork and/or topics that were brought up during semi-formal interviews were consistently cross-compared with scientific, peer-reviewed, farm-focused, farm-related or food-inspired literature, articles, newspaper clippings, maps and archives. The creation of categories was a process of continual reflection in search of validation and understanding.

Figure 4: Chronology of Methodology (part 1).
Fig. 4. should be read from left to right (beginning with cultural services in September 2010 and ending with comparative analysis in mid-November). This was the general process and/or major categories I used to store my data throughout my fieldwork. Details on the boxes can be found in the upper right hand corner.

**Categorical Process**

Each category involved a different form of analysis, focus, theory and comparison (all of which can be found in Appendix 1).

<table>
<thead>
<tr>
<th>Category</th>
<th>Form of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Farmer/Worker interviews and their reported histories</td>
<td>Qualitative &amp; Quantitative coding and calculations on estimates</td>
</tr>
<tr>
<td>2 Urban farming for Food Security</td>
<td>Qualitative &amp; Quantitative cost/benefit analysis</td>
</tr>
<tr>
<td>3 Ecological Functionality of the Farm</td>
<td>Qualitative coding</td>
</tr>
<tr>
<td>4 Governance and Social Power Scales</td>
<td>Qualitative coding and Modeling</td>
</tr>
<tr>
<td>5 Urban Farm Energy Flows and Sustainable Solutions</td>
<td>Qualitative coding</td>
</tr>
<tr>
<td>6 Animal Ethnology</td>
<td>Qualitative coding</td>
</tr>
<tr>
<td>7 Swedish Agricultural History</td>
<td>Qualitative coding</td>
</tr>
<tr>
<td>8 Annual Budgets</td>
<td>Qualitative and Quantitative cost/benefit analysis and tabling</td>
</tr>
</tbody>
</table>

*Table 1: Category table (full detail found in Appendix 1)*
Once the data was categorized, categories were cross-compared, opened up and compared again with other categories in order to review further insights into the farm’s functionality (figure 5).

Figure 5: Chronology of Methodology (part 2).

Fig. 5 should be read from left to right. The categories that were created during the research process were opened up during this period of work, cross compared and rearranged. Emergent understanding 'emerged' from a continual feedback to older data with new insight or data added, as well as questions with the farmers.

Through new insights and emergent understanding, different syntheses were tried (fig. 6). Each synthesis illustrates a different pattern in which I sorted, arranged and revealed my continually co-evolving understanding of data over space and time. I first tried labeling multifunctional urban farming drivers (Multifunctional drivers are elaborated on in full in Appendix 2) but eventually stopped because the fabricated
'drivers' I had 'discovered' could not be forced into the labels 'social' or 'ecological' or 'economic' - the drivers were social, ecological and economic but so much more. They flowed into each other and across scales of space and time.

Incorporating what I had discovered from the drivers, I constructed a timeline model of a multi-scaled historical outline, including embedded 'Hierarchies of Control' as well as a short, condensed history (explained and found in Appendix 3 Figure 13). This model was extremely helpful for understanding cross-scale interactions, however, it was missing many of the expressions, emotions and quotes I had gathered throughout the fieldwork. Of the expressionism found in the drivers, there was nothing of the sort in this model.

Reflecting on all previous data, syntheses and knowledge I had gathered from the very begin of this project, I began to write a narrative. Under complexity thinking, I was able to combine earlier calculations, reflections, quotes and data, while simultaneously given the opportunity to critique the possible hegemony of 'the concern' and the point of view(s) I had carried and altered along the process.
Fig. 6. should be read from left to right. It shows the process of taking what was gathered from emergent understanding and trying out different ways of portraying the information I had collected. Each time I proceeded to the right (temporally – from blue to yellow to green to red), I would reflect on what I had produced previous and frequently would incorporate it or layer it into the next choice of interpretation.

**Writing the Narrative**

My narrative began with a skeleton outlined of my time spent in the field, on the farm or in direct contact or interaction with the farmers. From the outline I then proceeded to layer these physical, visual and often emotional experiences with details, pictures, peer reviewed reports and misc. other sources of references. Eventually, I began to sort connections and contradictions that had emerged throughout my reflexive analysis. These assemblages I began to juxtapose against one another from the collections of data I had gathered. The story ended in May 2011 as this month is the month that my thesis was due as well as the last time I met with the farmers.
Critical Reflections

*Artificial Boundaries and Limitations*

As was noted in the theoretical framework, by choosing to write a complexity narrative I am already assuming the role and accepting the contestability of an interpretive and reflexive report. The choice to organize this thesis in the way that I have chosen to organize it, should not be seen as 'concrete' or the *only way* in which to interpret the data (for as you will soon see, things are continually changing and in flux, one of the many features of a complex system). Someone else under the same conditions would probably have obtained completely different data and results. I take full responsibility for what has been written and have only limited myself in what I have chosen to include in this report or *not* include.

Before I had begun research, I most likely would have written that the boundaries of the study would be contained within the geography of the farmland. But the farmers, their business and the actions of their animals frequently took the farmers, and myself, away from the geophysical space of the farm in order to conduct tasks that frequently had nothing to do with what one might imagine a 'farmer' would do.

So instead, of focusing on space, or even the stereotypical conceptualization of 'farming,' I would say that my boundaries were fairly open for interpretation incorporating actions taking place over space *and* time. I followed participatory observations, relationships between people/places/things – and how they interacted with one another. My greatest boundary was most likely my own ambition to dig into details but I will leave you to be the judge of that.

To follow up on what might not be considered a stereotypical farming activity, an out-of-boundaries anomaly that I did decide to cover in detail within the narrative was a section on Swedish Forestry. During my fieldwork, I spent a substantial amount of time,
with the farmers, doing forestry work. I have chosen to incorporate this into my thesis because it is/was part of my understanding of what it means to participate in 'urban farming.' There is no clear cut, black and white answer to what 'urban farming' may be, 'it is, what it is' and so 'all borders were off,' except for the border I have chosen to establish and these I leave open to be contested.

A personal limitation when it came to recordings was my full grasp of the Swedish language. At times, I did not pick everything up but I frequently recorded interviews or made videos and was able to review at another time.

**Critique of Methods and Data**

The narrative approach is different from most scientific approaches and with this difference comes the obstacle of organization and presentation. Along these lines, because I have chosen not to follow the outline of the scientific method, I accept that this thesis may be interpreted as disorganized if the reader was expecting distinct separations between methods/results/discussion. But to this I must argue, this was my point - to combine them into one! I found this combination exceptionally more challenging and complex, yet rewarding, to incorporate the methodology, results and discussion in such a way that my purpose and motive as well as my reflexivity could easily be seen in the context and through the text, while striving to create a flow to the story and follow the temporality of my fieldwork.

Seeing as I have spent an incredible amount of time writing and re-writing, my greatest critical reflection would be, if I were to do it again, I would have taken more classes in anthropology and on organizing information with the specific intent of writing a narrative but I know that there is not one way to go about this. On a side note, and relating to one of the major themes I have chosen to emphasize, I would also have read

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12 Something that Agar (2004) highlighted for writing an ethnography as the 'triad constraint' – it becomes my responsibility to create understanding within the boundaries of three different points of views – the subject, researcher and audience. Also explained in Appendix 4
more Michael Foucault (but there is still time in my life to do this).

Welcome to Häst Gård! the last *urban* farm in Stockholm, Sweden.
Chapter 4: The Narrative of Urban Farming

Introduction to the Farmers and Farm

“No one has any idea about the Swedish food system,” said the 4th farmer (F4) in his Småländ dialect with a relaxed gaze looking out over the organic spelt field he was planning on harvesting soon. I could count myself as one of those who had thought that I knew about the Swedish food system (because I had read about the Swedish food system) but physically, had no idea. I had originally sent an email to the last urban farm in Stockholm, Sweden (Map 1) (within a 10 min walking distance off the blue subway line in Akalla (see Map 2)) promising to volunteer for a 'half-day' of labor in exchange for interviews and the ability to shadow the farmers in order to eventually write a thesis about urban farming.
F4 took a long pause before he started up the engine of the tractor which released a memorably distinct smell of biodiesel (rapeseed oil). It was my first day on the farm and I was getting a tour of the urban farmland/cultural reserve by one of the farmers. F4 explained that of the 412 hectares (map 2), the farmers were allocated 100 hectares for cultivation (currently being used to grow 5 different organic grains) and 85 hectares of 'semi-natural' permanent pasture. Though, the farmers are expected to manage and maintain all of the 412 hectares as a park/cultural reserve. 'Semi-natural permanent pasture or meadow' land means they are paid money to *not* add anything extra to the land (other than what the cows and sheep add naturally). I shared my squished place in the tractor with a canine companion, the farm's sheep herding expert, 'Nell' (who happened to be an extremely friendly black and white border collier).
Map 2. Is a map of Hästa Gård (‘hästa gård,’ directly translated from Swedish to English means; ‘the horse farm’) and Culture Reserve. The estate house of Hästa Gård is located in the mid to upper left hand corner. The Akalla blue-line subway stop is a few hundred meters northeast of Hästa Gård. The whole reserve is maintained by the farmers.

F4 was in his late 20s and had been working on this farm for the past two years. He was an anomaly as a farmer merely by his age; the average farmer's age in Sweden was 53 (Jordbruksverket 2011). F4 was primarily put in charge of the organic agricultural side of the farm, and was more recently (in 2010) joined by F5, also an anomaly, also in
her late 20s (but perhaps even more of an outlier because of the statistically low, but rising, number of women farmers in Sweden (Jordbruksverket 2011)). Besides cultivating crops, F4 spent a portion of his time with the cattle herd because he considered the ethology\textsuperscript{13} of grazing animals his specialty. To give you an example of his dedication to the herd, when he whistled, the cows would come running to him. He had taught them to do this through positive reinforcement (this reference can be visually found via youtube: 'Förföljd i köttfabriken').

Just then, F4 was called on his mobile and told that some of the park visitors were frightened by a few cows that had escaped from one of the farm's four paddocks because the electric current on the fence wire had run out of juice. The wire was no longer an effective deterrent for the cows who seemed more interested in the patches of clover outside of their fences. Nell perked up when F4 gave him a quick glance. Nell knew that he was going to play a role in the solution to this problem, he started salivating, whimpering and fidgeting in place with excitement.

F4 mentioned that Nell would never run into a paddock filled with a horde of cows. That would be like playing with fire. A critical mass of cattle can be dangerous for dogs, but one on one – counting speed and pointy teeth - Nell was better at coercing and intimidating animals back into their paddocks than humans were. F4 said that cows escaping from paddocks was a common happening in most livestock farms but with far more media attention, phone ringing and community based concern in the urban settings (requiring expeditious action to be taken). He mentioned that all of the farmers often had to return to the farm during off hours, primarily due to animals escaping into the urban community. (picture 1)

\textsuperscript{13} Ethology is the study of animal behavior in relation to the animal's context
After my tour of the farm with F4 and Nell, we ate lunch with a group of approximately 15 others from Daglige Verksamhet (DV), Studie Framjandet (SF) and the Criminal dept (CD) who, F4 explained, helped around the farm with miscellaneous tasks. All of these organizations are altruistic non-profits, based in the city and all of them act, in some way, as collaborative bridge organizations for people who may be individuals with special needs (DV), currently out of work (SF) or on the rebound from some hard knocks (CD). As many of the individuals themselves explain, the farm gave them the opportunity to reconnect with nature (farm animals and the outdoors) as well as the people and work that gave them a sense of value and well-being.

Near the end of lunch, F1 walked in, dressed in bright orange neon lumberjack pants and his steel toed boots. He had just come back from an entrepreneurial forestry job. F1 was the person who had replied to my email two days earlier. He had called me back, speaking in perfect “Queen's English,” and told me that he liked my idea of an exchange of farm labor for interviews, particularly the aspect of emphasizing cultural
services\textsuperscript{14}, and that I should come down and check out the farm on a Friday at the end of August.

When he introduced himself in person, he spoke in a perfect Stockholm Swedish dialect and continued to ask me questions until he quickly realized who I was and switched back to his British English. He hesitated because I had been responding to his questions in Swedish, “Which language do you prefer?” he asked me. “Swenglish?”, I replied in question, “Either or, I may not pick up everything in Swedish but I'm working on it – whatever is easiest for you,” I said. He shrugged in honest nonchalance.

During the early afternoon F1 gave me a different tour of the farm and I had the chance to meet F3 driving a combine harvesting wheat. F3 popped his head out and asked F1 in English, “How does it look?” (picture 2)

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{combine.jpg}
\caption{F3 (left) and F1 (right) by the combine.}
\end{figure}

F3 is from Romania but has lived all over the world. He had picked up a bunch of different journeyman skills while living in the U.S. during the cold war though had originally been educated as a mechanic. As it turned out, this was his first time

\textsuperscript{14} Cultural services (MEA 2005) are categorized as, “aesthetic and recreation experiences, cultural, intellectual and spiritual inspiration, as well as ecotourism.” Cultural services, coupled with provisioning (i.e. providing food or water), supporting (i.e. crop pollination) and regulating (i.e. climate and disease control) services define what the Millennium Ecosystem Assessment has described as Ecosystem Services; natural ecosystem processes and services that humanity receives “for free.”
harvesting, even though he had been employed on the farm for years. F1 walked over to him and called me over to join them, I had been scribbling everything down. F1 proceeded to explain to me and F3 how we would know whether or not we were reaping too high and then warned, “You'll feel and hear it when it's too low (because the combine will be scraping the ground)!” F3 hopped back in the combine and went back to harvesting, F1 and I continued our tour around the farm and he began to tell me more about himself and the farm's history.

**Urban Farming is Expensive**

F1 was the founding employee/farmer of Hästa 4H Lantbruk AB, which had been run under the umbrella non-profit organization, 4H since 1995 (*Appendix 3 Figure 13*). Coincidentally, F1 didn't consider himself "a farmer" (though, I was already challenging him at this statement from my observations) was born and raised in Stockholm, formerly educated as a mechanic and was dubbed “Stockholmer of the Month” by the city of Stockholm in May of 2010 for all his altruistic work on the farm, promoting cultural heritage and connecting the farm with the neighboring people and the community of Stockholm. F1 owned a landscaping business before working for 4H and preferred to be working outside because he just could not stand the idea of “four walls.” If he was given an option, his work would involve sunny days, the outdoors and the use of his horses - of which he owns two (workhorses) that reside in the stables on the farm.

The workhorses were definitely put to work. They were frequently used to help with removing trees while F1 was doing sensitive tree felling, as well as when he manually 'horse-mowed' the Swedish crown princess's lawn along with other urban park locations throughout the city of Stockholm (horses icon on map 3). Before starting up the farm with 4H, he was working with animals at a smaller 4H club in Stockholm.

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15 4H is an international, member-based organization (standing for hands, heart, head and health) that began in the U.S. and emphasized agriculture (http://www.4-h.org/)
Map 3: Hästa Gård and the Business's Regional Entrepreneurial Activities.

Map 3. This is a general map of the locations I visited with the farmers during my fieldwork or location that they had collaborative business relationships. I did not include the military base or any of the forestry jobs (there were many, many of these jobs at all different location throughout the city of Stockholm. This map can be referred back to throughout the thesis for references.

F1 said that he and the board of 4H spent a long time looking for locations in which to begin the organic farm. They were looking for locations that were within or near to the city of Stockholm but noted that there were some good reasons to begin farming in this location. This was due partly to 4H's own ambition to attract more attention to itself and farming but also because the municipality was willing to first lease the land and then help aid them financially.

As the general assumption goes, 'urban' land is more expensive than 'rural' land – more people living in less space gives the space a higher value. Of course, there are other factors that go into this equation, but perhaps more important for the city of Stockholm (as well as the rest of Sweden) is to take into account who controls the land and/or has the final say in how the land is, or will be, used. There are many stakeholders involved in
the decision process of land use but the municipalities of Sweden have, what has been called, a “planning monopoly” or 'final say' in land use (Stockholm City Plan 2009). For Stockholm, this general assumption regarding land value is most definitely realized and it may be considered fiscally irresponsible to designate 'city' land for farming use. Unless the city and municipality, who control the land, advocated and supported such an endeavor, as they have for urban gardens (Barthel 2008). F1 reported that Stockholm, along with the county, has done just this for Hästa Gård. In 1994, Stockholm’s municipal Park Program was created in order to provide more funding for landscaping and maintenance of urban park spaces (See Appendix 3 figure 13).

The Common Agricultural Policy

Leading up to Hästa Gård's formation, there was an expectation that the country of Sweden would be joining the E.U. Meaning that all farmers in Sweden would be placed under E.U.'s agricultural fund called the Common Agricultural Policy (CAP). The CAP is a massive agricultural fund that makes up approximately 40% of E.U.’s total budget as of 2011 (and at one point was 2/3rds of the E.U.'s budget) (E.U. 2011). By becoming a member state, all national agricultural barriers (tariffs and import taxes) dissolve into the E.U. and all legal processes, on matters of commodity (including agriculture), must go through the E.C. (European Commission or the legal arm of the E.U.). This in turn, directly effects every European farmer who belongs to an E.U. member state.

The CAP is said have originally intended to preserve traditional farming from external competitors but also has some grounded significance related to food security16 (IEEP 2008). The concept of an agricultural policy can be founded in most Western European countries dating back to WWI and WWII and taking hold after the Treaty of Rome (IEEP 2008). During the Second World War, cities like Stockholm and London tripled their use of food producing green space in the cities (Barthel 2008, Steel 2009). The German U-Boats gave the urban dwellers of London a suffering reminder of their

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16 'Food security' refers to the availability of food and ones access to it
heavy dependence on imported foods during the First World War (Mumford 1946). Allotment gardens sprang up everywhere during the Second World War, much like the "Victory Gardens" in America. After the war, the agricultural polices continued to promote these 'food security/traditional farming' functions in Europe. More specifically, the CAP now allocates a quantity of payments based on specific, yet fluctuating, 'agricultural criteria' (hectares of land, number and breed of farm animals, type of farming practice, etc.) and distributes these payments to each farmstead in all member states.

In 1992, the E.U. changed certain 'agricultural criteria' in the CAP, financially rewarding farmers who placed greater emphasis on the environment (Jambor & Harvey 2010 Appendix 3 Figure 13 & Appendix 6). This change in the CAP would eventually become another financial incentive and resource for 4H to begin farming Hästa Gård, as the non-profit was already dedicated to organic farming methods under its mission. However, Swedish farmers did not have access to 'benefit' from the CAP until 1995, when Sweden joined as a member state, consequentially the same year that Hästa Gård farm officially began (Appendix 3 Figure 13).

In exchange for the CAP payments, Hästa Gård is expected to follow certain regulations as to how the land can be used or managed. The CAP regulations are aimed at promoting the biodiversity of red-listed species, pasture/meadow birds, insects and plants, which fall under what they have identified as “semi-natural pastures or meadows” (as mentioned earlier) (Kumm & Hessle 2010).

F1 and 4H brought with them a small herd of sheep and a handful of horses. Combining the newly available CAP money, the municipality's park program fund, plus 4H's own desire to have an organic farm in the city, they began to farm the fallowed land (Appendix 3 Figure 13).

Beginning to Harvest in the City

F1 reported that for the first few years on the farm, he spent an arduous amount of
time using his landscaping skills, clearing away the brush and re-growth of plants that had grown over the pastures and meadows. He told me that historically, the farmland had been maintained as pastures or meadows by the handy work of naturally grazing animals (primarily sheep and cows) for hundreds, if not thousands of years. However, the land had been abandoned four years before they began to lease it from the municipality in 1991, which made his landscaping job more tenuous (Appendix 3 Figure 13).

The city archives mention that the land may have been occupied until 1991 but cultivation on Hästa Gård was abandoned even earlier than this, between 1985/1986, which only makes F1's argument on the difficulty of landscaping more sound (Swedish National Heritage Board 2007). The archives also note that 4H took over Stora Huset the estate house on the premise that had been built in the 1600s, as their county office in 1993 (picture 3).
The idea behind cultivating the land, from 4H’s perspective, was to grow organic feed for the animals in its 10 Stockholm clubs. F1 would be employed by salary and was responsible for maintaining the farm’s functionality as well as keeping track of the farm’s costs. By 1995, Hästa Gård technically was, and still is, the only farm remaining in Stockholm municipality.

F1 said that the organic certification would enable the farm to receive a specific ‘organic’ CAP fund that was more than what non-organic farms would receive. However, there was a waiting period based on the soil conversion before the farm could be considered 'organically certified.' For Hästa Gård, this period was reduced to two-years because the land was not being converted, but was being cleared of trees and brush by F1. The waiting period only paid 50% of what the farm would eventually receive after two years.

“During those first few years, the business lost money and 4H footed the bill,” said F1. After a long pause with his eyes steady on the pasture in front of us, he said, “that was not an comfortable time period.” By starting the farm and being the only
employee, the board of 4H expected him to carry the responsibility for financing the farm, yet, all of the costs of farming were substantially more than any of the farm aid funds he was receiving. F1 had to look for financial alternatives other than farming because, by itself, the economic function of farming wasn't enough to pay for the farm, at least, under the contextual conditions. As he said earlier, he hadn't really seen himself as 'farmer.' He could grow livestock feed for the 4H clubs but didn't see that it would be possible to generate enough income from farming sales alone. At this point, he was under pressure to find another means of income.

**Feeding the Urban Context**

By the end of my first day on the farm, I decided to go for a ride with F4 and F5 (picture 4) to the nearby slaughterhouse at Husa Gård to pick up the meat from the ten pigs they had raised throughout the spring and summer (map 3). On the way, F5 let out a sigh and told F4, “That was tough to drop them off last week...” By the time we left the slaughterhouse they told me that the whole package was estimated at somewhere between 700 to 1000 kg of pork. I had never seen that much packaged pork in my entire life. I couldn't help but inquire further, “How much does Hästa Gård actually raise or sell in terms of kilos of meat annually?” Both of them weren't quite sure on the exact numbers but they could give me estimates in the amount of kilos each animal usually yielded as well as an estimate of the total number of animals slaughtered annually. According to this, I was able to calculate approximately 12,300 kgs of meat annually (table 2).
Following my interest in 'urban food security,' I couldn't help but wonder how many Stockholmers this amount of meat would feed. The average Swede in 2009 ate 85 kg of meat annually but almost half of this quantity (51 kg) in 1960 (Jordbruksverket)
If we use these numbers in order to estimate how many Swedes are fed by Hästa Gård's meat production, they fed 145 Stockholmers a year as of 2009 or it would have fed 241 Swedes back in 1960 (table 3).

<table>
<thead>
<tr>
<th>In 2009 - The average Swede eats 85kgs a annually (Jordbruksverket 2009)</th>
<th>12,300kgs / 85 kg = 145 Swedes are fed by this amount of meat in 2009</th>
</tr>
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<tbody>
<tr>
<td>In 1960 – The average was 51kgs annually (Jordbruksverket 2009)</td>
<td>12,300kgs / 51 kgs = 241 Swedes are fed by this amount of meat in 1960</td>
</tr>
</tbody>
</table>

Table 3: Hästa Gård’s contribution to Stockholm’s 'urban food security' (2009 vs. 1960).

But what did these numbers mean in terms of scale and 'sustainability'? I, having recently finished two books on this topic and coming straight from the Stockholm Resilience Centre, wondered what this meant at the national scale. How could I make these numbers more relevant to city dwellers? If we round up for the farm and say that they can feed 150 people and we hypothetically use this farm as the prototype for 'sustainable farming' (which the farmers themselves would say is a wrong assumption – but that their farming technique is substantially more 'sustainable' and holistic when compared to most conventional farms) we would need something like 10,000 farms, just like Hästa Gård, to feed Stockholm's population at 1.5 million with Stockholm's current meat consuming habits (This, of course, does not account for the appetites of the rest of Sweden's 7.5 million other residents, nor does it calibrate for many, many other variables: climate, habitat, soil quality, city, etc.).
Realistically, appetites regarding the consumption of meat, or any other food type, have changed for many reasons over the past 60 years or even the past three millennium for people living in or migrating through Sweden. Measuring a city’s 'food security' by calculating its population’s current meat consumption is not the best method of calculating a city’s level of 'food security' (as others have recommended against doing, Rocha 2003, 2007).

**Continual Imbalance.** However, what is of interest regarding the amount of people fed vs. the number of people living in Stockholm is the massive difference between these numbers over time; the fact that this difference is growing, not shrinking, in the city of Stockholm. This is to say that the number of people living in the city plus the quantity of meat consumed annually (1960-2009) has drastically outweighed the amount of meat produced in Stockholm, as time has gone by (Jordbruksverket/SCB 2011). This growing difference equates to a growing dependence on food imports from somewhere else, outside of the city (arguably, from outside of the country of Sweden (Jordbruksverket 2011, Deutsch & Folke 2005, Jordbruksverket 2005)).

Both F4 and F5 were surprised by my calculations on the number of Stockholmers that the fruits of their hard labor contributed to feeding. In fact, I think they were stunned by the numbers, which made me feel ashamed for even calculating them. F5, with a blank and somewhat perplexed look on her face, said, “Wow. That's not very much...is it?” F4, on the other hand said, “I think we can triple, maybe even quadruple the herd size.” I couldn't help but wonder, could the city space handle such a high number of cattle?

**What is 'Sustainable' Urban Farming?**

On my second day on the farm I had the chance to interview F5 more in depth. It was a Sunday and she had already been hard at work for quite a few hours turning up the soil on one of the fields. I walked out to the field that F5 was plowing, a little uncertain if I was going to be disturbing her by asking to interview her in the tractor. She saw me
waiting at the edge of the field with my pad of paper and pen, stopped the tractor engine, opened the tractor door and then hollered at me across the muddy field with a big friendly smile, waving at me to hurry over to her, “Come on! Are you coming?! Hop in!” She, like everybody who worked on the farm, was tan from working outside most of the day, wore work clothing that consisted of dirty overalls, mud boots and followed what seemed to be an unspoken rule on the farm – always carry 1) measuring tape and 2) a pocket knife.

I took out my iPhone to record her. I could understand most Swedish because I had been an exchange student in Norway for a year back in high school and the languages seemed fairly similar, or at least, I didn't have too much of a problem understanding. However, I could not hold my pen straight to take notes while the tractor was in motion so I used my iPhone as my record keeper instead.

F5 was a friend of F4, also from Småland, and began working on the farm as an intern earlier in 2010, eventually to be hired on to continue working with the animals and agriculture. Previous to this internship, she had been interning with one of KRAV's founders at Husa Gård, the farm we had visited the day before, 34 km from Hästa (Map 3). I was unaware of this during our visit and began to inquire more about KRAV, Husa Gård and slaughterhouses.

F5 told me that the owner/farmer of Husa Gård and the slaughterhouse told her that he doesn't actually make any profit, what-so-ever, from the slaughterhouse. The costs

17 Considered Sweden's highest standard of an organic label, following IFOAM's 'organic' regulations. FMI, ifoam.org
from the veterinarian (an E.U. requirement) and everything else, made it extremely
difficult for small farms to make profit when choosing to own a slaughterhouse. He said
that owning a slaughterhouse didn't make a lot of sense financially, unless you had a huge
cattle rearing operation and were focused on profits. In order to just make ends meet and
not lose money for owning a slaughterhouse, the Husa Gård farmer said that they were
required to slaughter animals almost every single day.

Which seemed absurd to me after what F4 had told me the other day regarding
Hästa Gård's costs. For the slaughtering, butchering and packaging of their lamb, Hästa
Gård lost something like 60-70% of their total profit. Who makes any money from this
transaction?! She told me that the regulations had set such high costs, expectations and
taxes that both small time slaughterhouses and small time farmers felt the pinch.

Organic slaughterhouses may, legally, be more humane than the non-organic
slaughterhouses but their costs are no-less cheaper. For farmers who are legally and
financially bound to raise animals and grow food, not based on yield of harvest or kilos
of meat but on promoting the 'semi-natural,' cultural landscapes and biodiversity under
the CAP, it became difficult to maneuver an urban farm's production towards greater
profitability.

The Husa Gård farmer's reasoning for having a slaughterhouse had more to do
with the ethics of the animals. Not only because he didn't want the animals to be stressed
out before they were slaughtered but apparently he said that the stress of driving the
animals puts a lot of stress-hormone into their muscle, which then affects those who eat
the meat (He was not alone in these thoughts – Greger 2007; Gebresenbet et al., 2003;
The tractor hit a bump or a rock and I had to rearrange myself because I dropped my iPhone. We changed subjects to focus more on her, “So. What are your reasons for farming at Hästa Gård?” I asked. F5 like F4, was interested in creating and promoting more of a sustainable, organic, urban agriculture in the city. Along the sustainability side, she told me that she and F4 hated driving tractors because they knew that the amount of driving and the quantity of diesel they burned was not sustainable in the long run. Even if the tractors were filled with the supposed 'environmentally friendly' biodiesel, it was a sustainability façade. As she put it, “the fact is, the rapeseed oil is coming from rapeseed plants that were fertilized with fossil fuel fertilizer and then processed into biodiesel, the processing of rapeseed into diesel takes even more energy.” F5 said that she and F4 had been working together with personal goals to reduce the external inputs on the farm (i.e. reduce diesel use, electricity, water use, etc.) but this was difficult because they still had a lot of business connections off the farm and needed that off-farm business to pay their bills.

**Sustainably Unsustainable.** F5 explained that they frequently drove to Husa Gård, the other slaughterhouse or to their off-farm business connections. This created a 'sustainable' conundrum for the farmers. In order to slaughter their animals, the farmers were forced to completely go against the 'sustainably-relevant' von Thüren energy efficient city model¹⁸ (reference map 3 for a visual). That is, no longer did the farmers bring their animals to the city to be butchered, as they would have done for most large cities throughout the history of civilization¹⁹, the farmers are required to drive their

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¹⁸ Henrich von Thüren's model from 1826 in his book *Isolated State*, specifically highlights the importance of energy efficient urban food structures. If we model a city, starting with a fertile plain, we have the central urban structure and directly along the urban fringe we would have an area for growing veggies and milking cows. The cows would provide an essential, but perishable, food - milk as well as manure for the veggies. Outside of this would be a small forestland in order to provide an energy fuel for the city dwellers (and possibly pollinators for their veggies). Outside of the forest would be the field to grow grains. The grains could more easily be transported into town. Outside of the grains would be the grazing animals who could essentially walk themselves into town to be butchered. A river, however, would completely change this model because it would alter the energy flows (in a very good way for the city).

¹⁹ For example, in London during the 1700s, cowboys from Scotland would walk their animals hundreds of km from the highlands
animals up to 97km away from the city (Skebo! Map 3), have them slaughtered and then pick up the meat later and drive it back to the city at another point in time (Steel 2009). I checked on F4's comment from the day before and it turned out, they would have to get written permission from the county council if they wanted to increase the herd of cattle to any number over 400 steer, due to concerns of toxicity from the manure (Landstyrelesen 2011).

Though, farming for profit was not a major reason for why F5 was at Hästa Gård, she said that she was striving to improve the city's recognition of farming and farmers in general, but that an increase Hästa Gård's total food sales would not be a bad thing. Essentially it meant that they could focus more on farming alone and not entrepreneurial activities. “What kind of entrepreneurial activities?” I asked.

F5 said that she was afraid of having to do a lot of snow plowing or other miscellaneous activities in order to pay for the farm. F5 said, “Yeah, last winter, F4 would be hanging out with me and some friends at a bar but would then receive a call from work and would just have to get up and leave us at the bar, go home, take a short nap and then wake up around midnight or 2am in order to snowplow the streets of Stockholm until the early morning.”

Urban Farming is Entrepreneurial

A few days later, I was dressed in green neon lumberjack pants that I was borrowing from F1, and was participating in entrepreneurial activity. I was doing what F1 called a 'job.' We were cutting down or trimming trees, under the employment of the county and municipality. My responsibility was to move logs and branches make sure nobody had a tree limb fall on them.

F1 told me that after those early years of losses, he began doing what he knew of Scotland to the city of London to be sold and butchered (Steel 2009). Before they were butchered, they had lost quite a bit of weight from the long trek. So they’d be fattened up on the leftover barley from beer making.
could generate profit for the farm business; landscaping and forestry. Not surprisingly, landscaping/forestry have gone hand-in-hand with agricultural work in Sweden for quite some time (of course, not for every farmer but for a large majority of them, (Jordbruksverket 2010)). Due to the northern latitude of Sweden, Swedish farmers can naturally expect shorter growing season then southern Europe. This partially explains why Swedish farmers were historically known for some sort of wood working/forestry skills during the non-growing winter season (ranging from 4-11 months, depending on the latitude in Sweden). Once tractors became available within the last century, snow plowing had also become an optionally high source of income.

Entrepreneurial activities, like snow plowing and forestry, were “part of the job” and this, as all of the farmers explained to me in some way or another, was merely how this urban farm business was able to pay its bills. In fact, entrepreneurial jobs were not only 'part of the job' but, economically, averaged 28% of most Swedish farmer's income - primarily from forestry (Jordbruksverket 2010).

Swedish Forestry is Urban Farming

Unlike agriculture in Sweden, forestry alone can be conducted year round. It pays fairly well for the labor and equipment costs, and with 150,000- 200,000 people expected to move to Stockholm within the coming 20 years (Stockholm City Urban Development 2011), there is high demand in and around Stockholm for foresters due to the new urban developments. This demand, coupled with F1's landscaping skills (picture 5), has made the occupation a year round financial aid for Hästa Gård's business.
Contextually, forestry is a job that is perfect for the environment of a country known to be highly dense in forest. Forests are estimated to span 45% of the geography of Sweden (Skogstyrelsen 2010). Current silviculture\textsuperscript{20} practice, established in Sweden's 1993 Swedish forestry act (SFA 1993 via Skogstyrelsen 2010), has placed equal value in 'sustainable' forestry yield and the preservation of biodiversity.

F1 told me that a large part of his work, in fact, a substantial portion of his time, consisted of preserving the rare and/or old growth trees that were remaining in or around the city, like the old-growth oaks. He did this by clearing away other trees or brush that made rare species more vulnerable. F1 explained that Hästa was financed, quite substantially, by forestry and sensitive tree landscaping. But he also mentioned that his livestock did most of the work to promote the oaks by doing what they do anyway – they ate grass! Otherwise the oaks would become overcrowded with re-growth. The old oaks themselves, for example, have been found to enable the most diverse fauna of beetles in Sweden (Palm, 1959). These old growth habitats sustain a substantial level of vulnerable

\textsuperscript{20} The method of Swedish forestry; felling, clearing, pruning, replanting etc. (see www.Skogstyrelsen.se 2011)
biodiversity (Ranius & Jansson 2000). But how did they become vulnerable?

**Before 'Forestry Management'**

**Forest biodiversity is 'vulnerable,' because monocultures are 'thriving.'** The Swedish method of silviculture practice has promoted a monoculture composition of forest for much longer than it has promoted the preservation of biodiversity. In a sense, F1 has been doing the 'clean up' work left over from a silviculture practice that came to be problematic with regard to the marginalization of biodiversity in Swedish forests but also, the directly connected devastating losses in forestry income (Skogstyrelsen 2010). The monocultures of trees became vulnerabilities to themselves when natural disaster 'shocks' struck21 and thus, vulnerabilities to forest industry. The paradox, of course, is that in order for the forest industry to protect themselves against these environmental/economic 'shocks,' the promotion of biodiversity is now being seen as the 'keystone' to help them keep their profits.

Interestingly, mix-perennial old-growth deciduous habitats, like the ones F1 is hired to protect, were at one point, not vulnerable. Also interestingly, these old-growth systems provided a substantial amount of food, among other things. According to Eriksson et. al., (2010), the composition of the mid to southern Swedish forests were once more heavily comprised of trees like the hazel (*Corylus*), which provided nuts rich in fat and protein, the elm (*Ulmus Minor*) which provided medicinal properties from its leaves also proving “of great relief to cattle in the winter and scorching summers when hay and fodder is dear” (Evelyn 1664 via Jackson 1994), the Tilia tree's (*Tilia tomentosa*) Tilia flowers could also be used medicinally to aid against colds (Coleta et. al., 2001) but were lauded by beekeepers for the honey produced from the flower's nectar as well as the

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21 i.e. the snowball effect of the massive wind storm called Gudrun in 2005 that felled the equivalent of the amount trees that are harvested in a year in Sweden, within two days. Many scientists believe this was due to the same age tree height. The trees were reported to have fallen like dominoes. A mixed aged, mix-perennial forest does not fall like dominoes. The subsequent aftermath, the following year, was an increase in 'pest species,' i.e. the European bark beetles – *Ips Typographus*. The beetle thrived off the fallen trees but preferred live trees. Because of all the falling trees providing incubation from the year before, the following year they devoured 1.5 million square meters *more* of forest (Skogstyrelsen 2010). The interesting aspect about this beetle is that it has been in European forests for as long as the Norway Spruce has been a part of European forests. *Ips* is only a 'pest' because the forest compositions have been drastically replanted with higher percentages of Norway Spruce. The tree happens to have a high economic value.
maple flowers that bloomed early in Spring providing a well needed early food source for the bees, the alder (*Alnus incana*) was great at growing and fixing nitrogen in poor soil so that the soil could be used to grow food later on, the oak (*Quercus*) provided acorns that pigs could be fattened up on, pine limbs and small pines were once used as fodder for goats and sheep (Levander 1943) and the Scots pine (*Pinus Sylvestris L.* ) that, before the 20th century, was commonly felled in Sweden for its inner bark due to the bark's edibleness to humans and their domesticated animals (Ericsson et. al., 1999). This composition completely changed with the formation of European 'forestry management.'

Scott (1998) points out that the practice of 'forestry' that is conducted in western countries, Sweden included22, became a state run science primarily to the credit of Prussia and Saxony between 1765-1800. This was due to either the state and/or crown's realization that under their current method of deforestation, they would quickly running out of the wood that had built their war ships, fueled the energy required for their ore smelting and mining practices as well as the many other economic benefits that the forests provided as a resource (Scott 1998).

The forestry science became pronounced in Sweden after the 1850s, to the credit of the Swedish Crown, State and industry (Östlund 1993). Before this period, only a small fraction of forest land had been affected by logging (Linder & Östlund 1998). However, during the second half of the 19th century, after a majority of the high quality old growth and deciduous forests had disappeared, along with their poly-functional uses, modern forestry management was introduced (Ekelund and Hamilton 2001, Östlund 1993).

Logged forests were systematically re-planted as monocultures of only two tree species; the Norway Spruce (*Picea abies*) and the Scots Pine (*Pinus sylvestris l.*) (Axelsson & Östlund 2001). These species became the 'creme de la creme' of forestry operations throughout all of Europe because of their quick growth and high lumber value

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22 The U.S. also follows this same procedure of clear-cutting and replanting (Gifford Pinchot, the first Chief of U.S. Forest Service, was taught by European Foresters)
(Scott 1998). They still are the two dominant tree species today in Swedish forests, making up 85% of Sweden's forest composition (Skogstyrelsen 2010, Axelsson & Östlund 2001).

Pyne (1997) noted that the drastic transformation in Swedish forest composition was due to a shift in “economic priorities, which promoted its use for industrial rather than agricultural purposes” (via Axelsson & Östlund 2001). The forestry 'science' was concerned with yields of wood rather than other, poly-functional properties that the mixed and old-growth forests could provide (food, medicine, etc.). Due to this narrow lens, the application of the scientific model reduced the complexity of the forest's ecosystem, simplified it and strived to control it through calculated numbers of growth and yield - 95% of the forests in Sweden are still under commercial use (Skogstyrelsen 2010). The dynamics of the multi-aged biologically diverse forests became same-aged and closely planted. Any information regarding old-growths and deciduous trees is, even today, difficult to find because most present day statistics regarding such information on forest landscapes are maintained from a production perspective (Angelstam et al., 2003, Eriksson & Hammer 2006).

After industrial logging was in full effect, the Swedish forests were no longer multifunctional, no longer providing fodder for animals or food for people but only profit for the crown, the state and growing industry (Eriksson et. al., 2010). The emphasis on industry and the lack of a provisioning forest meant there was first - an even heavier dependence on farming agriculture during the second half of the 19th century (Söderberg 1989), even though it was already difficult to feed the growing number of people residing in Sweden around the 1850s (Norman & Runblom 1988). The repercussions of this are partially illustrated by the many Swedes who emigrated out of Sweden23 – due to many other reasons as well: extreme weather/poor growing conditions in the 1860s, a marked shift from feudalism to capitalism and a nationally changing political system (that took place in 1866) (Björklund 2010, see figure 7 - between 1850s-1910)).

23 Interestingly for the city of Stockholm around this same period, in the 1880s, the population of the city nearly doubled from 168,000 to 245,000 (Anderson 1997)
consequence – a loss of memory and/or knowledge in how the previous forest composition could be used as provisions because the provisions were no long there (leaving no reason to remember).

We are “unlikely to care about that which we do not know” (Pilgrim et al. 2008). Miller (2005) has more recently warned that such losses in biodiversity and the continual exodus of people from the rural hinterlands, re-situating themselves in the urban context, would lead to “an extinction of experience.” Previous knowledge on natural history, and the knowledge of other forest tree benefits, once past down from generation to generation (for very good reasons), are now no longer of use to an individual residing in a

Figure 7: Immigration Influxes (provided by Nilsson/SCB 2004)

24 Similar in concept but a different take on what Giddens (1991) has called ‘Structuration,’ whereby the rules that structure our actions are based on a continual feedback with the medium of available resources in which we have to work with (or perceive that we have to work with).
forest replanted with unfamiliar species. (When was the last time you bit into the bark of a Scot Pine or ever knew that you could?)

Of course, not all food or medicine providing-trees have disappeared completely, even though our knowledge of their potential uses may have dissolved. This is because F1 climbs, manages and takes care of these old-growth trees through his sensitive forestry and livestock work. Many of these rare 'vulnerable' species can still be found on land in the city or in urban parks, controlled by the same top-down governing bodies that transformed the composition of Sweden's forests after the 1850s and, in a sense, helped to make them 'vulnerable:' the Swedish royalty, the Swedish State (and/or municipalities) and forest industry.

Extra Hand

Forestry for F1 meant an external source of income for Hästa Gård. With access to nearby forestry jobs and combined with other entrepreneurial projects, F1 eventually financed the farm after those first few difficult years. Once he began to apply his skills in entrepreneurial activities, he was able to not only pay for the farm's functioning but also make the business profitable - all the while growing, harvesting crops and raising animals. With higher profits, he was able to invest in more entrepreneurial equipment and time spent in entrepreneurial activity (which did not exclude farming based activities or equipment off the farm).

In 2003, F1 and the board of 4H hired another worker to help around the farm. Being quite fit and knowledgeable about farming, F2 was a good match to fulfill F1's current trajectory of entrepreneurial/4H farm jobs. F1 said that he eventually became disinterested in the labor and time demand and decided that he preferred working with heavy machinery (Appendix 3 Figure 13).

Unexpectedly, I met F2 during the first week I was volunteering and he was
helping around the farm (picture 6). According to the other farmers, he wasn't an employee of the farm. He now worked with heavy machinery and was scheduled to help build the new highway tangential to the farm but was not informed as to the day in which he would begin this project. Thus, he showed up on the farm and as F1 said, “He's still part of the (farm) family and there's always work to be done on the farm!”

Picture 6: F2 working heavy machinery.

When F2 'quit' in 2006, F3 was hired to replace him. The hiring of F3 made sense for the farm's entrepreneurial side. He had a strong work history in forestry and at one point owned his own forestry company in Romania. He was knowledgeable about different types of trees as well as different types of painting methods which he applied to Stora Huset (the farm's estate house – picture 3).
'Rich' Biodiversity

Cattle Tradeoffs

In the middle of my second week of fieldwork I was up at 6am to help F1 corral a few of the cattle into the farm's transport van in order to take the cattle to the 'Skebo!' slaughterhouse (map 3). The cattle were never happy about having to walk up or down any sort of ramp (as was highlighted in the HBO movie about the animal science professor who designed 50% of America's slaughterhouses (with the same movie title name, “Temple Grandin”) (Grandin 1990)), so the corraling took quite a bit of time and we ended up arriving an hour late, much to the disappointment of the veterinarian who was required to check them at Skebo! Along the way there and back, F1 told me more about how the farm had acquired the cows.

It was not until the early-mid 00's, that the farm acquired a herd of highland cattle and began to accumulate other breeds (often through 4H's connections). One of the other breeds of cattle is called "The Swedish Mountain Cow" (Fjällko picture 7). It, like the Highland cow, is about 2/3 to 1/2 the size of your generic meat rearing cattle (i.e. an Angus)(according to F4, F5 and Alberta Agriculture and Urban Development 2011). There size is not necessarily a bad thing unless one is only judging their functionality through an economic lens.
There are great historical and environmentally contextual reasons for why the Highland and the Swedish Mountain Cow are smaller in size. The harsh and snowy winters of Northern European meant that farmers had a lot of food storing to do, but not only for themselves (Saifi & Drake 2008). Their animals needed a large enough food source to get them through the winter as well as a large amount of hay for the manure that the cattle produced. The hay was mixed with the manure and stored so that it could be spread on the fields during the spring and fall in order to replace the nutrients back to the soil that had been reaped from the land during the previous harvest.

Historically speaking, the smaller animals, like the fjällko, required less food during the winter season which also meant less labor and, most likely, less hassle (Hallander 1987). However, due to the high demand placed on the economic value and the kilos of meat that the heavier breeds of cattle provided, the Swedish Mountain Cow had been reduced in numbers to only 1000 pairs by the mid-late 90s (Mason 1996).

The CAP has more recently motivated a change in this economic emphasis by,
coincidently, *economically* funding 'heritage' or local breeds of farm animals. The funding however, did not specify heritage breeds until after the '00s, partially reversing previous trends of disappearing traditional livestock breeds (Hessle & Kumm 2010, see table 2). Consequentially, after 2000, payments doubled for any farmers who raised livestock, the same period Hästa Gård acquired its herd. However, the number of livestock in Sweden is still on the decline (Hessle & Kumm 2010).

*Livestock Landscaping*

“Is this the American spy?!” said the officer with a smile and a chuckle. I was near the end of my second week on the farm and F1 and I were visiting a nearby military base because the military had been literally 'renting' Hästa Gård's sheep (the location of the military base I cannot reveal because I was sworn to secrecy) but we were only there to check on the sheep. The military had been using the sheep as natural lawnmowers because *real* lawnmowers kept on ruining the metal posts in the quadrant grid systems they had set up. The officer said that they conducted drills around the animals and the animal's presence, “made it more authentic or realistic to the real thing,” the military officer said. F1 and I sat down in the military mess hall for coffee. F1 added a dollop of milk to his coffee and then stirred with his measuring tape. According to F1, the sheep, as well as his growing herd of cattle, attracted not only the attention of the military base but eventually nearby municipalities who also wanted to rent his animals for 'livestock landscaping' their municipal lands.

Slightly before the municipalities began to contact F1, the payment scheme allocated by E.U.'s High Natural Value (HNV) Farmland in the CAP altered its emphasis of 'agricultural criteria.' The change tilted the payments by placing a greater emphasis on more livestock premiums and environmental-biodiversity aspects (table 2 as well as Appendix 3 Figure 13). However, the payments for the HNV Farmland and 'semi-natural farmland' ('Area Grants/area aid' and 'Environmental Old/New') would primarily go to the *landowners*, or in this case, the municipalities because they own all the land. This CAP payment is currently at 2650 SEK per hectare (Hessle & Kumm 2010) but the
municipalities did not have to see this as only an easy way of receiving money (though that may have been the tipping point). The land that was being landscaped could also act as a natural park for the locals, simultaneously promoting biodiversity (like Hästa Gård).

Table 4. The highlighted blue regions are the increases of millions of Swedish crowns (equating to millions of dollars) of CAP money that funded agricultural 1) use of land area 2) livestock farming and 3) environmental farming/biodiversity care-taking, all of which affected Swedish farming and any forms of grazing.

Table 4: Direct CAP Subsidies Between 1990 - 2004

Some of the most vulnerable species of Sweden's biodiversity (at least, the biodiversity that is known) in the Swedish landscape are reported to be directly linked to ruminant grazing (Kumm & Hessle 2010, Gustavsson et. al., 2007, Kumm 2003, Smith & Bruun 2002, Saifi & Drake 2007). The geophysical land around Stockholm that F1 had spoken of as being grazed for hundreds, if not thousands of years, by cattle and sheep, had developed in a co-evolving relationship with a large portion of biodiversity, including old oak trees (but also including field birds and grasses) (Gustavsson et. al., 2007, Kumm 2003, Smith & Bruun 2002, Emanuelsson et al. 2001). Specifically, the biodiversity was dependent on the unique ruminant livestock grazing 'technique' and pattern of grazing/livestock-fertilizing. Only now were these patterns a 'value' and concern under the Swedish agri-environmental policies because Swedish pastures and meadows have been disappearing (Kumm & Hessle 2010, Ihse & Norderhaug 1995; Luoto et al. 2003; Smart et al. 2000). (picture 8)
Prior to joining the E.U., Sweden’s semi-natural grazed farmland had gone from an estimated 1,300,000 hectares in 1920 to bottoming out at its all time low\textsuperscript{25} around 400,000 hectares in 1995, rising slightly after this to somewhere above 500,000 hectares - directly correlated to the CAP agri-environmental payments (Kumm & Hessle 2010, Jordbruksverket 2010). However, total grazing land has begun to slump again and, as of 2010, was below 500,000 hectares (Jordbruksverket 2010).

Forest re-growth, due to a general lack of ruminant grazers in Sweden, can be seen as the physical culprit to this loss of biodiversity in meadows and pastures (Kumm & Hessle 2010, Gustavsson et. al., 2007, Kumm 2003, Saifié & Drake 2007 & 2008). Kumm & Hessle (2010) point to the general national trend in the reduction of livestock holding. To put this trend into perspective, in 2005 Swedish Agricultural statistics reported 1.6 million livestock, the same number of livestock was reported almost two centuries ago in 1820 (Jordbruksverket 2005). Livestock numbers in Sweden were at an all time high, 2.5-3 million cattle, between 1900 – 1950 but began to declined after WWII because of globalizing imports (Figure 9). Changes that occurred in 2004 with regard to

\textsuperscript{25} This is to say, from whence records of land began to be recorded by the state.
the agricultural criteria in the CAP have heavily invested in payments in order to increase livestock numbers (table 4 & Appendix 6 table 5).

F1 told me that as time passed, the herd size at Hästa Gård continued to grow and he began to rent the cattle and sheep (i.e. 'landscaping with livestock' or 'livestock landscaping') to nearby municipalities (map 3) in multiple regions of Stockholm. By 2007, with a growing number of responsibilities, managing all the cattle, harvests, entrepreneurial work, the area becoming a 'Cultural Reserve' in 2006, F1 and F3 had an overwhelming amount of work to do and needed a little more help, specifically with the animals (Appendix 3 Figure 13). F1 and the 4H board hired another person, to take over the majority of the farming responsibilities. F4, with an extensive background and family history in organic farming, education in animal ethology and a high desire to promote agriculture in Stockholm, was hired in 2008.

Not long after F4 was hired he introduced Angus Cattle to the herd. F1 said he was a bit more reluctant about the Angus cattle because he believed they were a little too big for the type of grasslands in Sweden - “they get stuck in the mud and are more vulnerable in general.” That is, when neighbors are “walking their dogs and take them off their leashes, they may run into the paddocks and attack the cows.” Most cattle do not really tolerate this, highland cattle and Swedish Mountain cattle are smaller and quicker to react, Angus Cattle, due to their size (he believed) were a little slower to respond and then it wasn't just the cow's problem but his problem.

Preserving the Cultural Reserve

“Hold on,” I said, “Why and/or how did the farm become a Cultural Reserve?” F1 answered, “We didn't really have a choice. I mean, the land would have been developed into part of the city landscape if it had not been turned into a Cultural Reserve.”

He said that the land was essentially being used in a culturally traditional way
partly because of 4H’s mission statement, but also because of his own belief in promoting ethical farming. But, there were other cultural relics to buttress this decision: Viking rune stones on the land, bronze age burial grounds, the area as a park space for the nearby communities and, according to the Office of Regional Planning and Urban Transport (ORPUT) committee's definition, it was a significant 'chunk' within one of Stockholm's ecological corridors or "Green Wedges" (map 4) (ORPUT 2010).

Map 4: ‘Regional’: Green Wedges of Stockholm

Back in 1992, Sundbyberg municipality had already written in its master plan that it intended to protect the ecological space surrounding the Igelbäcken brook (south-east from the Igelbäcken Reserve, near to a 'livestock landscaping – see map 2 (upper right hand corner)) and make this portion of the brook a nature reserve. Sundbyberg municipality borders Stockholm municipality to the north and east but because the brook
starts in Säbysjön, it goes through Stockholm municipality, after going through Sundbyberg. Because the stream overlaps multiple municipalities, it would only make sense to 'preserve' the Igelbäcken if all municipalities that the brook babbled through, were willing to preserve the land surrounding the brook. In 2006, this willingness prevailed in Stockholm and the neighboring municipalities (Appendix 3 Figure 13).

The brook’s human related history is as dense as the urban landscape of Stockholm surrounding it. The brook was once more like a small river or stream, though over time and with the 'help' of urban development leaching water from it, the stream became smaller and smaller (Stockholm stad, 2010). Hundreds of years before the city began its concrete encroachment on the Igelbäcken stream, King Frederick I (ruler from 1720 to 1751), was the landowner and resident at a nearby castle (Ulriksdal). Lundberg S & Svanberg (2010) suggest that, due to the kings recorded interest in introducing fish into ponds, he may have been the individual to have introduced a particular type of fish known as the “grönlingen” in Swedish or the “stone loach” in English into the Igelbäcken brook. This species, now considered quite rare, became another good reason by ecologists and cultural historians to push for the creation of the cultural reserve. However, this was not the only reason for the 412 hectares to become a reserve. The functionality of the land had quite a particular history of changing use, context and meaning with politics possibly playing the strongest role.

'Urban' as a Contested Space

Politics and City Planning (refer to Appendix 3 figure 13)

A fourth or fifth cow had escaped from the same paddock I had visited from my first day tour with F4 and Nell. At this point, it was my third week on the farm and I was being driven out to the most distant paddock from the estate house (SE corner of map 2) and asked to 'weed-wack' around the edges of the fence. The electric current in the fencing had become weak because the grass had grown high enough to touch the wire and reduce its strength. I put my bag down and F1 quickly noticed this before he drove off telling me, “I wouldn't leave your bag laying around if I were you. I've had my
chainsaws stolen twice. Sadly, this neighborhood doesn't have the best reputation.” This flashed the visual memory of the humorously out-of-place spray painted 'tags' left on the windproof cowshed that one could see while walking from the subway station to the farm (picture 9).

![Picture 9: A spray painted cow shed.](image)

'This neighborhood' surrounding every corner of Hästa Gård was constructed a little over 30 years before but, throughout its history, had primarily housed a poorer (in relation to the average Swede's income) immigrant population, currently listed at 74-80% of all residents bordering the farm (scb 2010), and the location had a distinct reputation in Swedish architectural history (Borgegård & Kemeny 2004).

The fact that the neighborhood was only constructed 30-40 years earlier is a reminder that this urban farm was once only a farm, and not always 'urban.' Throughout the history of the farmland, the land was being juggled by a continually changing control of top-down policies and politics. One such change in top-down control led to the constructed residential buildings surrounding Hästa Gårds. It was called “The Million
Leading up to the Million Housing Program, the farmland had gone through quite a few political power shifts (or 'Hierarchies of Control' Figure 8-13). Starting in 1930, the city of Stockholm drew up its first more detailed outline of a city plan (Nelson, 2010). Hästa Gård was being used by the Swedish military and had been since 1905 (Appendix 3 Figure 13). The growth of the city was in a pattern that followed the rail lines away from the heart of the city, consequentially leaving green spaces in between (Ducas 2000). From an aerial view, it looked like green fingers (or 'green wedges' map 4).

Figure 8: Hierarchies of Control on Hästa Gård 1905 – 1966

Explanation of this figure can be found in Appendix 3 under “Timeline and Narrative Model Explanation”

By 1966, the Swedish crown relinquished decisive power of local land use to the local municipalities, which proceeded to go through stages of assimilation and rearrangement with neighboring municipalities (e.g. Stockholm municipality used to be many municipalities but was assimilated into one that has remained the same geophysical size since 1971). Due to this arrangement, the military began to leave the land of Hästa.
Gård (Hedman 2008, Ducas 2000). The shift in power meant there was less of a top down approach from the national level as the locals were granted more of a 'say' (figure 9).

Leading up to this period in the 1950s and 1960s, there was a huge influx of European immigrant industrial workers to many of the cities throughout Sweden (figure 7 see 1950-1970s). This influx was due to Sweden's changed policy on immigration and new regulations on worker hours. Couple these factors with Sweden’s declining birthrate and a booming industrial economy and you have a huge demand for more workers that the nation alone was unable to provide (Cars et al., 1991). Sweden however buttressed the industry by adopting a new immigration policy.

The planning for the 'Million Housing Program' began before municipal control was strengthen. It had become obvious that, from the industrial demand for workers and the influx of immigrants, there was a need to build more places for people to reside. The city municipality, as well as other Swedish cities with large immigration influxes (e.g. Rosengården in Malmö), quickly began to build apartment complexes surrounding almost every corner of what is now known as the Igelbäcken Reserve (surrounding Hästa Gård). Many architects and commentators have criticized the housing projects as the country’s

Figure 9: Hierarchies of Control on Hästa Gård 1966-1991
Explanation of this figure can be found in Appendix 3 under “Timeline and Narrative Model Explanation”
most poorly designed projects (Turkington 2004, Borgegård 2003).

Partially due to this driving demand to build the apartments quickly, the municipality had not thought through every detail and, consequentially, turned Hästa Gård into a **dumpsite**. A 30-meter tall mound was artificially created from the leftover blasted rock and construction material that was removed while the city was creating a subway system (completed between 1977-1980) to reach the communities (apparently, creating artificial mounds out of dumpsites is still something common in Swedish cities Qviström, M., 2008). The mound is called Granholmstoppen but was originally called Granholmstippen ("tippen" means 'garbage' in Swedish – see **picture 10**). It’s now primarily used as a Frisbee golf site and a place to practice parachute base-jumping.

**Picture 10: Granholmtoppen, as it can be seen today (2011)**

*Cultural Relics*

Before the massive 1960-1980s building and construction work had commenced, a number of archeologists from the national archive and city museum began to conduct archeological digs on the land (Hermodsson 2008). Throughout the late 60s, early 70s and up to the early 80s as well as more recently, they had unearth evidence of Bronze Age burial sites and multiple Viking rune stones with the help of some older maps (see **Appendix 6 map 6**). The archeologists brought attention to these relics but the attention didn’t 'catch' with the public, or policy-makers, and instead, construction concerns took priority until the late 80s (Vail et al., 1994) (this ambivalence can be seen by the creation
of Granholmtoppen, located directly next to a bronze age burial sites and placed on top of a ecologically sensitive marsh formally known as 'Hästa Träsk,' which is no longer present (map 5)).

As mentioned by F1, between the 80s and 90s the farmland of Hästa Gård, was abandoned and left fallow but was still under the control of the municipality (Figure 10). With 'green' city planning in mind, Stockholm’s 1994 Parks Program allocated funds for NGOs, like 4H, to improve the quality of life for neighborhoods surrounding the
park(farm) through park maintenance.

Figure 10: Hierarchies of Control on Hästa Gård 1991-1995
Explanation of this figure can be found in Appendix 3 under “Timeline and Narrative Model Explanation”

Within the following year of the 1994 parks program, F1 and 4H begin farming Hästa Gård (Figure 11). By the time 2006 came around, there were enough built, and growing, reasons to make the green space a Cultural Reserve (Appendix 3 Figure 13 can be referenced for some of the reasons).
F1 had noted, there were also many counter arguments over how the undeveloped space had separated communities from one another. Regardless of these arguments, the municipal space became a reserve (figure 12). In doing so, new top-down regulations were added so that the farmers had to follow new rules for how the land could or could not be used (Appendix 5).
“We should see the urban landscape as a contested space” (Harvey 1996). As time has gone by, the country of Sweden and the city of Stockholm have literally altered the composition and functionality of the farm on multiple occasions. Hästa Gård is not just a farm. It is or has been: a cultural reserve, a dumpsite, a Bronze Age burial ground, a military base, a previous home for Vikings, an urban park, a farm and now an urban farm. Can we really call Hästa Gård a farm if it is all of these things? I began to accept that it depends on your perspective and how you use the land or how the land uses you.

For example, the business of Hästa 4H Lantbruk AB is located on the land. But, in order for the farmers to pay for the lease of the land, half of the time (or more than half the time) they are doing miscellaneous forestry ‘jobs’ away from the farm (map 3) and off of the land. That is, Hästa Gård would not be Hästa Gård without the added labor that takes place outside of Hästa Gård.
For the Love of Farming

“Crunch!” went my shoulder as I tried to swing myself up onto the tractor bed with one arm. F2 and I had been driving tractors all morning preparing space in the field to store the last harvest of grass fodder but it was cold outside and I remember feeling stiff. He examined my arm after I told him something weird just happened. He told me, “that doesn't look too good. Do you want me to drive you to the hospital?” “Um..yeah..” I responded hesitantly, taking another look and agreeing, “That would probably be a good idea.”

I was required to take a hiatus in my fieldwork through a portion of October because, as it turned out, I had ruptured my bicep and was required to have surgery. However, there was still a waiting period before they could schedule me in for surgery so I showed up on the farm the following day.

F4 was working on one of the fields in a tractor, I joined him in the tractor and he began to tell me more about his goals regarding the future of Hästa Gård. He said that F1 was going to quit sometime around Christmas (which was something of a shock to me) because he wanted to spend more time with his family and that because of this, F4 needed to be able to increase the income coming from agriculture.

He said that one of the reasons F5 was able to farm with him was that when F5's internship came to an end in 2010, F4 cut his salary in half so that F5 could be hired to continue in helping him build up the farm's food production. This dedication to farming was impressive to me. F4 repeated something that I must have heard from every farmer, “it's not about the money. It was about the ethics of the animals and the lifestyle of farming.”

F4 told me that he had spent most of his life studying, cultivating, raising and learning about animal ethology. “The problem with agriculture is that farmers love to farm... and in a market economy, the market doesn’t want to pay for the full bill if it
doesn’t have to. It doesn’t want to pay for the ‘love’ put into farming – It will pay for the ‘love’ of plowing snow!’” He referenced the poor growing seasons in Sweden, and noted that this 'love' was even more neglected when it came to the Swedish farming context and his ability to compete globally.

F4 said that he had visited the year-round rotational grazing in the fertile landscapes of New Zealand, had been to Joel Saladin's Polyface farm in Virginia, which was illuminated as the best of the best in 'sustainable farming' in the U.S. (highlighted in Michael Pollan's best-selling food/farming book “Omnivore's Dilemma”). He admitted to have incorporated many of the ideas that he had acquired abroad into the function of Hästa Gård. F4 also admitted he was not as interested in participating in forestry. After the past few years of working entrepreneurial jobs, he said that he was not enthusiastic about climbing trees or plowing snow if he could avoid it.

Farming to him was, and is, a full-time lifestyle. He told me that he was much more interested in teaching about food and farming and promoting permaculture. Permaculture has a lot to do with respecting an animal's ethology, working with the natural functions of animals and getting the animals to do all the work that animals do, or behaviorally want to do, anyway. He stopped the tractor, opened the door and pointed at F1’s incorporation of Nell, who was corralling the sheep (picture 11). Nell enjoyed sprinting around rallying the sheep together, which made the farmer's job a lot easier when it came to shepherding them. Trying to control the animals only became more of a hassle to the farmers but, as F4 explain, “a large part of it has to do with what you consider to be a 'hassle.' It could be a great learning experience.”

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26 Permaculture: originally meaning 'permanent' ‘agriculture’ but began to also mean 'permanent' ‘culture.’ It is based on the idea of working with the ecology of context dependent landscapes in order to grow sustainable sources of food. The design primarily incorporates layers (i.e. canopy, low tree layer, shrubs, herbaceous, fungi etc.) is suggests 1) looking at the whole system or problem 2) observing how the parts relate 3) planning to mend sick systems by applying ideas learned from long-term sustainable working systems 4) seeing connections between key parts, “It is not the number of diverse things in a design that leads to stability, it is the number of beneficial connections between these components” Mollison & Holmgren (1979).
After this visit, I was required to take the month off because of the surgery. My physical work in the field had come to an end but I did not stop (and have not stopped) visiting the farm and meeting with the farmers. Though, from this point on, I was no longer on the farm everyday, only off and on. After the surgical procedure, I had a lot of time to lie in bed, recover and reflect on my fieldwork.

**Reflection - Nature's Time vs. Clock Time**

Looking back at my fieldwork, I had spent 20 hours on the farm or with the farmers in the first two days *alone*. I realized quickly that I needed to adjust what I had assumed would be four-hour, half-days of fieldwork. The farmers were spending 10 to 12 hours on the farm, doing farm related work or some form of labor that paid for the farm business to function. Often, we drove to satellite locations (map 3) where I physically did not have the possibility to walk away after lunchtime. But more importantly, we were often not finished with the task we were there to do, i.e. separating male and female sheep, felling/moving trees, feeding livestock that needed to be fed. Some of these tasks could not be ignored or they would create larger concerns in the future (i.e. lamb being born in a vulnerable season).
One day a week I would take off, sleep a lot (I felt that speaking and translating Swedish made me exhausted), and check up on all the notes I had transcribed. Sometimes I would do this after my work day was over but frequently I was too exhausted. The 'checking' was primarily conducted online through many different search engines (Google Scholar, Science Direct, The Routledge, Sage, Swedish archives, newspaper clippings, tangent interviews, reflections with professors – I explored many avenues). Something that ought to be pointed out is that, I was able to take days off. The farmers however, did not get to take days off – animals need to eat everyday.

Their work-day was 'over' when the function of the task that they were engaged in was finished (as well as anything else that needed to get done). Frequently, there were unpredictable variables that played a role in the actions that they could or could not do: if it had rained too much, one could not plow the field; if an animal was sick, one had to tend to the animal, if a drought occurred... Well, one could not really do much about a drought but remember to not plant peas again next summer (as was the case during the summer of 2010). Their work had less to do with mechanical clock time, and more to do with the unpredictability of naturally occurring phenomena, necessitating a different type of mentality when it came to thinking about time - 'Nature's Time.' Rather than the mentality I had been familiar with most of my life, having grown up in cities, “anything unexpected is bad, will ruin your schedule and will cost you money.” The farmers' way of thinking was more about “expecting the unexpected.”

Unless, a scheduled appointment had been made and 'expecting the unexpected' was not an option. Even then, this did not always mean that they could keep an appointment! Sometimes, cows don't like to walk up ramps and veterinarians have to wait an hour, or snow falls in Stockholm and friends are left waiting in bars, or cows and sheep escape from their paddocks and a late night return to the farm is required. This is not to say it was always enjoyable for the farmers to follow 'nature's time,' but it was not a surprise to them if something unexpected occurred (the farmers would most likely agree with the cows, the grass probably did look greener on the other side).
The usefulness of a mechanical clock didn't make as much sense when it came to tasks related to animals or the growth of plants. Animals, plants and precipitation followed their own 'clock time' with their own unpredictably determined rhythm, 'Nature's time.' Because the farmers' livelihood depended on animals, plants and precipitation they were more closely linked to Nature's timetables. Unless we began to talk about money and finances...

**Multifunctional Farming**

When I returned to the farm in a sling around mid November, harvesting season had ended. I sat down with F1, F4 and F5 for lunch and must have chatted for over an hour. During harvesting season I had never seen them eat lunch for longer than 30 minutes because there was always so much work to do. Now that the season had shifted from Fall to Winter there was more 'time' for them to enjoy their lunch.

After lunch, there were two visitors who were interested in getting a tour around the farm. I decided to shadow F4 while he gave the tour. F4 began to take us around to showcase some of the permaculture projects he and F5 had been working on on the farm.

These were the projects he had mentioned before that followed the concept of *working with* the natural functions of the animals and their surroundings. One was a movable chicken coup that had been created so that the chickens are able to be outdoors, fertilize the grass but simultaneously be protected from red foxes (residing on Granholmstoppen) by a solar-panel-powered electric wire wrapped around the outside of the coup (three of these coups can be seen in the right-hand corner of picture 10). He described how they had raised ten piglets starting in the spring and fattened them up from nearby supermarkets. That is, the pigs were all fed by day-old leftover food from the supermarket stores ICA and Maxi, food that would otherwise be thrown out as waste (a food recycling practice that is no longer legal in other E.U. Countries\(^7\)). This venture is reciprocal at all ends, supermarkets would otherwise be charged by the city for throwing

\(^7\) There is a great article regarding this same topic by John Law and Annemarie Mol (2008) titled, “Globalisation in practice: On the politics of boiling pigswill”
out their leftovers and farmers are given a free source of fodder for their animals.

F4 also showed the small greenhouse he had built where the egg-laying hens resided during the winter. The greenhouse is multifunctional in design making it labor/time conserving for the farmers. The hens are able to receive the few hours of sunlight, stay warm during the winter months and simultaneously fertilize the greenhouse, which could be used to grow food in the summer. Hay or wood chips (left over from F1's forestry work), were used as the carbon portion of the fertilizer mix and added as a floor base so that the nitrogen mix of the chicken manure enabled the perfect growing conditions for food in the coming springtime.

F4 explained that “If you were to contrast this greenhouse with the huge barn for cattle,” completed in 2008 when F4 arrived on the farm, “you have a perfect comparison of a single-functional structure vs. a multi-functional structure. That is, there is very little sunlight in the barn and its primary use is for the storing and distributing of cow manure (in the spring and fall). This barn model doesn't really take into account the well being of the cattle.”

Surprising to some (myself included), F4 said that the cows do not really need to be indoors for the winter, even a Swedish winter. This was somewhat dependent on the hardiness of the cattle species. He, personally, wanted them to be outdoors and said that they were generally happier to be outside. The steer became restless in the barn and sometimes injured themselves or each other. They manage to do quite well in the cold as long as they had a possible cover/shelter from wind and rain because the combination made them lose heat easily. He said that they had no problem with extreme weather as long as food and shelter were available.

**The Preciousness of Living**

After the tour concluded and the couple left the farm, I couldn't help from prying further into what F1 had mentioned early, regarding his feelings of the vulnerability of
Angus. Especially when F4 had touched on the fact that, 'it was somewhat dependent on the hardiness of the cattle species.' I asked him why he had decided to introduce the Angus cattle to the herd. He looked at me as if I was asking a trick question.

F4 said that he knew he could get more meat from this breed, nearly twice as much meat as the highland breeds that dominate their herd, which essentially meant more income. The quality of Angus meat is also considered 'better' by most 'meat' standards because the Angus breed carries more fat than the insulated, long-haired Highland cow (Alberta Cattle 2010). What was once a positive characteristic for survival (insulating long hair and lower body weight for cold, northern European winters), now became a vulnerability under an economic driven commodity market, even with subsidies he told me.

**Thinking by Nature's Time.** It wasn't that F4 or F5 wanted to be raising Angus over the Fjällko or Highland cow, they just wanted to be able to farm in a way that respected the animal's well-being, their own ethics and the ability to pay for the farm to function. He and F5 understood exactly what the economic and biological trade-offs were. They were quite familiar with the fact that the Angus wasn't as 'hardy' as the latter two but cattle are not cheap and they, like humans, cannot 'produce' a herd of offspring at the same speed as the E.C. can change its CAP payment arrangements. Growing a herd of Angus cattle is a long term investment and the CAP payments seemed to be a false sense of security. As F4 noted, the CAP funds were systematically being reduced anyhow (as of 2013 Appendix 6).

All of the farmers were practicing an exceptionally high standard of ethical animal treatment. But for F4 and F5, if they chose not to raise the Angus, it became a vulnerability to their farming lifestyle. Unlike F1, who had managed to find a different way to finance the farm through entrepreneurial activities (of which he enjoyed), they only wanted to live the lifestyle of farming by farming. It did not matter which breed they were raising, whether Fjällko or Highland or Angus. It was about respecting the individual life of an animal, the process and preciousness of living.
Before I left the farm I visited F1 who had been working on paper work in Stora Huset. I wanted to know about the actual numbers of the farm's annual budgets, to double check some of my hunches. Upon inquiry, he printed a bunch of them out for me to go through in my own time. Right before I opened the door to leave Stora Huset, F1 said, “We have a gift for you. For all your hard work!”

On my way back to my apartment via the subway (picture 12) with the 'gift' the farmer's had given me, I couldn't help but laugh at the juxtaposition of all the neon lights, bright colors, mechanically controlled, 'to the second' opening and closing doors and pristine cleanliness of the subway line compared to the lamb carcass 'gift' stuffed into my duffle bag resting next to my overalls with my knife, measuring tape and cow manure stained boots.

Picture 12: Stockholm subway ride home

**Financing Urban Farming**

I began to pick through, sort and calculate the percentages of the farm's annual budgets that F1 had given me (Appendix 1). From a tally of all the farming sales in their
annual budgets (over the four years of budgets that I have before 2008; 2002, 2003, 2006, 2007), one can see F1 was not trying to profit from farming. Animal feed and hay he had sold to 4H made up at least 3-10% of the total income from all the budgets years. Though all the farm sales of all animal/meat and grains are listed under one title 'foodstuff' with a total income of 1%, or less, of the farm's income until 2008.

By the end of 2008, you can see that F4's skill in farming for profit is put to work - the annual budget now lists all the animals by the sales of their meat source; chickens and pigs are added to this list and the sale of food goes from 8,000 crowns in 2007 to 108,000 crowns by 2008 - from less than 1% of the budget income to at least 2%. By the end of 2010 it is at 200,000 crowns (or 4%). However, from my calculations (which, I hoped were human errors) the farming costs went up with the income, so much, that the farming that was being conducted on Hästa Gård was costing substantially more than it would cost to not farm, even including all the farm subsides (Appendix 1).

The more that the farmers had increased agricultural income, the more they lost total net profit and, in turn, were required to do more entrepreneurial work to make up for the losses (which they have done according to these budgets). This is not easy to see because unlike the income, that is separated by source, all of the costs and payments of everything farm related are thrown together with the highly profitable entrepreneurial costs in their budget sheets. One must remember that farming, forestry and snow plowing are all part of the same business.

“*It's not about the money*” (F1, F4 & F5). I couldn't understand. By all observations and actions, the farmers were farming and I participated with this farming. The farmers were working overtime on and off of the farm and the residents of the city of Stockholm were able to enjoy a beautiful urban farm/park that portrayed a facade of an economically productive farm. But was being an *economically productive farm the point*? Obviously, F1 wasn't even trying to produce food for profit, yet he was maintaining

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28 I spent an extremely long time separating the costs, which also means I am guilty of human error. I accept this, partially because these calculations do not define my conclusion or the farmer's reality as it is continually changing (Appendix 1)
Stockholm's biodiversity through forestry work and livestock landscaping, respecting the lives of the animals, teaching children about the ethics of treating animals and was able to finance and organize one of the most complex operations I could have fathomed (once I pulled my head out of the sand) – **I was missing the point.** All of the farmers were providing a place for people and organizations (DV, SF, CD) who didn't always 'fit' into an economic lens – in fact, all of these aspects were invisible when it came to their annual budgets.

Anything that *could not* be predicted, controlled, commodified or put into numbers was worth *nothing*. I began to realize that I had marginalized all of the other multifunctional aspects of urban farming into one economic lens that hardly did the farmer's any justice.

*Nature's clock,* undeniably present with the sunrise and the sunset, became a farmer's *cost* as long as it could not be predicted and/or calculated. Under a economic lens, it was as if the farmers were being punished for nature's diversity, unpredictability and ambivalence, a 'reality' of which they could not control.

**Making Compromises**

In January, I called F4 to see if I could help out a little with the farm business by having my friends and I buy food from the farm directly through him and F5. During the call he mentioned that F1 and F3 had quit the farm around Christmas, 2010. F1 had got a new job working with the Swedish Environmental Protection Agency where he was able to continue doing sensitive landscaping and forestry (with his work horses) for a nearby municipality. The municipality would hold him to a strict 8 hour work day, 40 hours a week timeframe. F3 quit for his own reasons.

The problem however, was that the non-profit, 4H, legally owed 700,000 Swedish crowns (the equivalent of $100,000 – as of January 2011) to F1 and F3 because they did
not take their annual 5 week-vacation time that was legally available for them to take. Animals, much like humans, do not take vacations from needing to be fed - \textit{everyday.}

I've been told that in rural farming regions of Sweden, governing bodies have taken care of this vacation 'issue' with 'substitute farmers' who rotate in for the farmers taking their vacations (throughout the year). But no one thinks about the need for a 'substitute farmer' in the city because cities are no longer known (or expected) to produce food. Whose problem did it really become?

The board members of 4H have told F5 that they could only hire her on as a 'part-time farmer.' 4H did not want to make this sort of an offer, but it has had no other choice. In essence, F4 and F5 are now leading the farm in all its functions, starting 'in debt.' This debt was not necessarily created by the farmers, or 4H, or even the animals that needed to be fed but by a combination of complex elements, self-organizing and not completely predictable - forcing other elements to submissively comply with one another. In this case, F4 and F5 have been left to make most of the compromises.

Having sacrificed their salaries up until this point, they did not really have much maneuverability. In terms of making profit through farming, all of the top-down policies and institutions were limiting what they could and could not do - other than change their farming expectations entirely. Ruling the 'quitting' option out, they were being forced to accept, much like F1 had to accept in those earlier years of financial losses, that they needed to look outside of the farm in order to provide income for the farm to function.

In late winter I visited the farm and sat down with F4 and F5 for coffee and Swedish pastries, catching up on things. They were looking stressed, which made sense when I heard, that they were getting that same pressure that F1 dishearteningly spoke of during those first few years of farming when 4H was footing the bill. F4 and F5 were already two weeks behind in payments. F5 said that, “we can fell trees, but can't climb trees like F1 did. We just want to farm.”
Top-Down Politics and Urban Farming Contradictions

During my last chat with F5 in April she was looking tired and distraught. She told me that she had spent all of last weekend staying up with one of the cows that was having troubles in labor. Eventually the cow could no longer hold on to life. This experience was not only emotionally and physically distressing to her but also fiscally problematic. Now F5 felt forced into an awkward place when it came to the deceased cow. She didn't know what to do with it.

Her legal options, under the E.U.'s CAP, and Sweden's national policies would only allow her and F4 to eat the cow. Technically the CAP does not permit the sale of animal meat that is not slaughtered at an E.U. registered (organic) slaughterhouse. F5 told me that, “the CAP is like the opposite of freedom, we don't want the money because it holds us back from being able to farm the way we want to farm. But where else are we going to get this type of money to pay for the farm?”

Finding messes, Growing imbalances. The CAP gives the farm funds to possess grazing animals that promote the biodiversity of red-listed species (rare livestock, pasture/meadow grasses, birds, insects and their grazing techniques that promote old-growth habitats) but stipulates that they are restricted from 1) adding even 'organic' fertilizers or bases to the soil (like limestone or coral shells to make the soil less acidic) which reduces their possibilities for higher 'urban food security' yields and 2) how they can slaughter and sell the meat. There is a 30% tax placed on the meat that is sold (Jordbruksverket 2011, F4 & F5).

The concerns posed by the city, the municipality, the county, the state and E.U. (along with all of their subsidiaries) are very rational: promoting biodiversity, concerns of manure toxicity, food safety concerns and slaughterhouse policies. But nearly all of the policies placed on the farmers have marginalized their possibilities to produce food in the city. Top-down regulations and incentives are biodiversity and park emphasized – not biodiversity and park and food producing focused (as well as all the many other
possibilities and functions that receive no financial credit).

*The socioecological footprint of the city has become global. There is no longer an outside or limit to the city...*” - Sweyngedouw (2003)

**Tracing messes.** What this means is that the city of Stockholm receives well maintained, beautiful urban parks/farms, like Hästa Gård, with a high range of biodiversity (including the few remaining old-growth trees). Simultaneously, *somewhere else*, outside of the city of Stockholm, *somebody else* is producing all the food to feed the 1.5 - 2 million city dwellers (subtract 145 from Hästa Gård's production).

When it comes to this 'problem of scale,' Wilson (2008b) brings our attention to the need for noticing 'imported and exported multifunctionality.' The question being - are we, in places like Stockholm, able to have a more 'multifunctional,' post-productive, organic farm, like Hästa Gård, in the city precisely because we are *actively* importing large amounts of food and fiber from exporting countries (like New Zealand, Ireland & Brazil)? He argues that “rather than a win-win scenario in which all territories can simultaneously move towards multifunctionality,” there is a substantial imbalance that is occurring. At the macro scale, 'global multifunctionality' and 'global sustainability' are perhaps a 'zero-sum-game' (Wilson 2008b).

Back at the local scale, Stockholm's supermarkets are continuing to import from elsewhere (SBC 2011), creating a 'metabolic rift,' the essence of which Moore (2008) called, “unsustainable food and resource exploitation,” allocating the brunt of (pollutive) externalities to the more macroscopic global scales and cities like Stockholm are placed “under no obligation to return the waste products to the point of production...”

“...while we pretend those consequences don't exist... If we want a rich and varied landscape on our doorstep, we are going to have to start eating as though we

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29 All farms are 'multifunctional' but some farms provide less 'multifunctionality' (monoculture crops, equating to low biodiversity, remember; food is biodiversity) while others provide greater multifunctionality (polyculture crops, grazing techniques - like the multifunctional farming techniques on Hästa Gård)

30 Foster (1999), creating this term with the help of Marx, “irreparable rift in the interdependent process of social metabolism” created by the rise of capitalism.
Only a Price Tag

After F5 had stayed up all night, all day, and the following night with the mother cow that had passed away - talking to her, trying to calm her down and finally watching and feeling her pass away - F5 felt stuck. Given her only legal option, that she and F4 were the only ones who could eat the cow, she felt torn as to what she could physically and emotionally do.

Under an economic lens, we don't get to see this part. The rest of us living in the city, with the few remaining old growth deciduous trees in Sweden, no longer foraging for hazelnuts in the forest (because we don't know how) or farming for food (because somebody else is doing it), we're not required to see this part. Yet, we city-dwellers still have to eat. Somebody else, other than us, is there to see it all, there to say the caring words, there to hear the breathing stop, there to be beset with the experience of death and no longer an appetite to eat.

All we see is 200 kgs of meat and a price tag that cannot even begin to calculate all the complexity of this animal's existence, let alone the physical and emotional complexity of the farmers who have raised it. But in this case, we don't even get to see a price tag (and normally don't even get to hear this story) because governing policies have marginalized this perfectly good source of food as illegal, this farmer's actions as 'invisible' (as if it all never happened), and her emotional well being as an externality.

I would argue, most of us have no idea about the Global Food System.
Chapter 5: Panoramic View – Complexity Reflections

Assessment of the Concern:

“Producing food, maintaining biodiversity and feeding the growing global populations of people, living in and moving to cities, currently estimated above 50% and predicted to rise to 80% by 2050, is and will continue to be, a concern for policy makers, ecologists, farmers and many other stakeholders.”

The mess that does not fit. There is definitely a concern, currently at Hästa Gård. However, who ever it was that wrote this concern above does not seem to have consulted with many farmers about a farmer's present concerns, let alone their concerns for the future. For this concern does not even begin to address the complexity of how Hästa Gård is woven into this Gordian knot.

But rather than deny any future possibilities and become bogged down with something that has yet to happen or decide to make my own soothsaying prophecy (as this concern has done), I would prefer to turn our attention towards how this became a concern in the first place. I will do this by first drawing from this case's 'urban farming's' connections and contradictions and then bring focus to two different ideological power relationships that emerged throughout the course of my fieldwork: the aim to control and/or working with systems. I am hoping to end on a positive note but we'll have to wait and see how this emerges.

“He hath eaten me out of house and home; he hath put all my substance into that fat belly of his.”
- Shakespeare Henry IV Part I: act 2, scene 1

Stockholm and Hästa Gård are in a pickle when it comes to food production. The farmers at Hästa Gård are more than prepared and willing to help address all of the variables in the concern above AND promote other aspects that are not included in the concern: respecting each animal's specific ethology and well-being, long-term 'sustainability' and multifunctionality of farming (the movable chicken coup, recycling
urban food waste with feeding the pigs, the multifunctional greenhouse, etc.). They are already maintaining and promoting biodiversity through forestry and farming (for many reasons, partially financial reasons, but also ethical), and would like to increase their food production (though this is also somewhat financially motivated – but who or what is motivating them?).

The farmers are, instead, met with policies, regulations, incentives, restrictions and taxation creating limitations on their production and a city that is preparing for 150,000 + more people under the assumption that someplace else will be feeding these people because it will not be Hästa Gård! (As noted earlier, Stockholm would need 10,000 farms like Hästa Gård to feed the consumptive meat eating habits of 1.5 million Swedes. table 2 & 3). Who is in the position to make any changes that would feed or accommodate 150,000 people (Figure 12)? The combination of top-down variables have directly inhibited the ability for Hästa Gård to contextually begin addressing the food production aspect of the concern above.

Yes, appetites can and do change\textsuperscript{31}. However, they most definitely have not been shrinking in Stockholm, if we focus on the longue durée (i.e. 1960 – 2009). Consumptive imbalances, as well as dependencies on outside food sources, have only grown over time (Jordbruksverket 2011). This has led to feedbacks in 'import/export multifunctionality' and many other self-organizing consequences that people in cities, like Stockholm, no longer have to see\textsuperscript{32}.

"...discussions about global environmental problems and the possibilities for a 'sustainable' future customarily ignore the urban origin of many of the problems" \textsuperscript{(Sweyngedouw & Heynen 2003)}

We are missing the point if we think food production, within a city, is a city’s top concern as of now. For ‘urban farming' has shifted shape throughout history over space and time. Now, finding itself taking on a different active shape and form but perhaps losing its foundation? What happened to the importance of producing food in a city?

\textsuperscript{31} As referenced earlier (Barthel 2008, Lungkvist et al., 2010, Steel 2009)

\textsuperscript{32} Compare the last time you ate animal meat to the last time you last saw an animal slaughtered. Imagine how this comparison might have been responded to 100 years ago. Connections have been lost along the way.
Many of the possibilities for long-term urban food self-sufficiency have simply vanished after Sweden's industrial revolution. The city of Stockholm has shown little concern for urban farming except in times of 'urban food crisis,' (i.e. WWII) which still, only tells one side of the story, and is only a short 'blip' in a long history of growing consumption and power imbalances.

Stockholm and Sweden's combined city/state, top-down governance has been unquestionably embedded in a history of industrialization - exacerbated under a marginalizing economic drive that gained momentum in the mid-to-late 1800s. However, Sweden's industrialization did not just begin out of thin air. It emerged from a path-dependent history of social hierarchies (the crown, state, clergy and industry) who continued to bolster a governing mentality, or aim to control, before and after the politically and economically distinct shift in government took place in 1866.

This aim to control continued to permeate through almost everything that occurred there after; exploitative forestry management methods, economically driven agricultural production, a continually intertwined growing dependence on a globalizing capitalist market system (Figure 9-13, table 3, 4 & 5 Appendix 6 table 5). The aftermath of these top-down actions “structured the field of other possible actions”: a mass emigration of Swedes in the late 1800s/early 1900s (figure 7), a city/state supported reversal of this in the 1950s in order to fuel Swedish urban industry (figure 7), a markedly marginalized and externally dependent agricultural sector, as well as a vulnerable and completely altered forest composition – orderly replanted in easily calculable rows, 85% of which consisting of monocultures.

Let us not forget, that the old-growth deciduous forest composition of Sweden was once literally a food-forest-farm before governing powers reduced its provisioning services and turned the forest into one function – economic output. 'Urban farming' was food-forest-farming. Yet, after driving Sweden's biodiversity to the point of vulnerability

33 Quoting Foucault (1982) from the introduction
34 paradoxically, a mass immigration into the city of Stockholm during this same period
in the forest and farmland, we see now, a top-down effort to 'undo' some of the damage it has done (Swedish Forestry Act 1993/CAP, table 4, Appendix 4 table 5).

'Undoing some of the damage' by proclaiming that top-down governing institutions are working with the biodiversity of the forest, is neglecting to notice: 1) that this whole monoculture forest/vulnerable biodiversity 'mess' was created by the same hierarchical institutions that made the 'maintenance of biodiversity' become a concern in the first place! 2) that the biodiversity of the forest or farmland that is being saved must have significant value to the industry or the governing institutions who, only now, see multiple benefits in their promotion, primarily that of prolonging their hegemonic rule (i.e. the municipal 'land monopoly,' livestock landscaping, promoting urban parks) and 3) that it is not the 'hierarchies of control' themselves (as people) who are physically 'undoing some of the damage.' It is their power relationship ("actions acting upon actions") that has bequeathed the action to 'urban farming.'

'Undoing some of the damage' is not about making the world any more equal. It is not about changing the continually growing hegemonic imbalances of power, mounting resource consumption, long term dependencies on outside sources of production or the ballooning spectrum of social inequalities that Stockholm, as well as most other cities, have embodied as they have grown over time. In a sense, 'undoing some of the damage' is like a gang of people stealing your lunch and then expecting gratitude when they give you half of it back, not because they feel in the least bit guilty, or even nice (though they may appear to be), but because they would like you to have the energy and strength to provide lunch again for them tomorrow! (Maybe I'm getting a little carried away, I know this is not the whole story, just a different way of telling it).

With regard to Hästa Gård, are top down 'hierarchies of control' taking everything into account? At the current moment, definitely not (why must the CAP keep changing?).

35 My point is not to say that people in Stockholm on the lower end are worse off than before. My point is rather, to point out the growing spectrum of a difference in between both ends, Stockholm does not have any ghettos. The other end of the spectrum does not necessarily need to be located in Stockholm nor does it have to be a person (it could be the vulnerability of biodiversity in forest or ecosystem), it could be in Brazil or Thailand (based on Deutsch 2005). We're all connected, it's only easier to see the connections if you've traced the actions.

36 Plato once remarked, “any city however small, is in fact divided into two, one the city of the poor, the other of the rich.”
No one from the top, except perhaps 4H, has actually spoken personally with the farmers. Instead, the priorities of 4H, the City, Municipality, County, Nation & E.U. are 'taken into account' first and foremost (Figure 12). Which leaves the farmers, as well as their priorities (to ethically produce food within Stockholm city (as well as the ability to address the concern listed at the start of this chapter)), significantly marginalized. This is not to say that the farmers are powerless but that the actions from above have (again) “structured the field of other possible actions,” as well as the very actions associated with the production of food involved in urban farming. This in turn, has significantly limited their food producing urban farming autonomy and farming lifestyle. Instead of food production, the hierarchies of control have promoted biodiversity, urban park space and urban growth.

I have nothing against biodiversity. Nor do I have anything against more company in the city or 'green wedge' space in which to meander around in. My personal concern regarding the lack of urban food production should not be taken as a non-appreciation of other functions, but rather, as a call to look beyond the socially constructed simplified picture handed to us by the same top-down governance that allowed for the imbalance to accrue over time. For we cannot deny that people and food are inextricably linked, or deny that our actions (upon actions) are speaking louder than words. For imbalances in food or imbalances in power are more tangible than we are willing to admit. The negligence or inaction to perceive these imbalances has required (and continues to require) some serious effort on our own part, to simply ignore them. Perhaps our own perception is the very problem of it all?

For we are, in essence, continuing to work backwards under this marginalizing 'trance-of-a-mindset' or compressed-way-of-thinking. Hurriedly trying to calibrate and control for new urban food crises, to be able to calculate cultural services into monetary value, to promote vulnerable biodiversity yet, somehow - we keep forgetting or leaving these things, or people, and our active (yet often distant) relationships to them,

37 I would be the first person to believe that these farmers would be able to start an urban farming revolution
38 Quoting Foucault (1982) from the introduction
39 I can count myself as one of the many lucky Stockholm immigrants who is able to spend (clock) time hiking in Stockholm's incredibly beautiful 'green wedges'
out of the picture. I write “we,” though who really is, “we?” I wonder if these people, things and their active relationships would be as easily ignored if we could feel them dying right in front of us? I could only hope that we would actively do something.

Connections, far from our perceivable ‘realities,’ are lost. Those of us who are sitting at the higher end of a power imbalance are not really required to care, or better yet, we are not given the opportunity to care because the connections are so distant from us, that we actively choose to not see (or accept) that we are, in some way, connected to a slash and burned Brazilian old-growth rainforest making way for soy or grain production to feed 80% of all the ‘Swedish’ cattle40. Yet, from our 'high horses' we decide to protest the people who are doing the burning of the rainforest rather than make the purchasing connections back to our own refrigerators.

My consideration. As much as I have been, and would like to continue, pointing a finger directly at the city/state, Swedish crown, industry or the abstract entity of a globalized capitalist commodity market for causing all of the concerns and imbalances we, or the farmers, are addressing now (or will have to possibly, and painfully, address later on), this would be acting out of sheer ignorance. The 'unsustainable' repercussive continuation of an imbalanced political-ecological power relationship is not the fault of individual people, or 'cities,' per se41, but a combination of complex, self-organizing processes.

My personal belief, as to how these active power imbalances have been able to persist has, in large part, to do with: 1) our conditional, contextual and continual 'extinction of experiences'42 (an active and continual form of forgetting, not necessarily by choice) that currently has perpetuated 2) an unquestioned hierarchical mentality, logic or compressed-way-of-thinking.43 This logic, in effect, has aimed to control, continually marginalizing the full complexity (or possibility for greater understanding) of the actively

40 Deutsch & Folke 2005
41 Many kings have long since gone and we can't even agree on how to define a 'city.'
42 i.e. Changing the composition of the Swedish forest in the 1850s had a lasting affect on the ideologies of how people perceived how a forest could be used
43 Scott (1998) has called this compressed way of thinking “high modernist ideology”
functioning dynamic systems around us.

It is not that we do not notice the breadth of complexity surrounding us (or for me, the actions of ‘urban farming’ that I could not see at the beginning of my case study because I was only focusing on food or ‘urban food security’), it is more that we simply are not willing to acknowledge the continually changing plurality of expressions, interactions and complex relationships. Rather than perceiving and working with as much of this perceived complex reality that these systems exude, our ‘messy,’ compressed-way-of-thinking has turned functioning plants 'into weeds,' which have proceeded to spill over into neighboring gardens.

The farmers at Hästa Gård give a perfect example of this disharmony. Though their livelihoods and lifestyles depend on 'nature's time' and/or working with systems – the complexity of living and growing entities, the unpredictability and often uncontrollable conditions of climate – they are only remunerated for 'clock time.' That is, they are only economically rewarded for that which they can control, predict, quantify and compress into calculable (and taxable) variables. Due to a market economy not “wanting to pay for the 'love’ put into farming” - F4.

It is not that the farmers want to reduce the intricate complexity of springtime or the birth of a baby lamb into a framework of monetary values, but under their context, they must. Thus, “time is of the essence,” but not the essence of flowering vegetable plants in the Spring or Summer. The essence of a yield in mass, quality, quantity, and time in which a supermarket can expect its delivery as well as a price in which it is able to compete at on an international market continually flooded by the year-round growing seasons of Spanish and Italian vegetables along with meat imported from New Zealand and Ireland.

Recommendations

44 To be noted, the mechanical clock has only been around since the middle ages. Before this, we only had 'nature's time' to follow. Mumford (1934) posited that the invention of the clock, not the steam engine, was what allowed for the industrial revolution to proceed 'on time.'
Stop marginalizing complexity (aiming to control complexity). Instead, start appreciating complexity (working with complexity). Which, 'simply' would mean: start trying to make complete connections. This would eventually entail addressing the power imbalances that have been enabled, and continually held in place by perpetual State hierarchical actions, top-down approaches and a globalized capitalist market.

Understanding that the actions of States, markets and individuals are, at this point in history, all woven together - I'll save further discussion on how this might be done for my next thesis.

However, when I say that we should be addressing power imbalances I am not necessarily promoting that we have to drop everything, leave the city life and head back to the forest to live a wholesome, foraging lifestyle (I think the forest composition has altered too much even if we wanted to do this!). Let's not deny that people are currently and actively living in cities now which makes a city actively in flux with everything around it. I would argue that we can work with this flux, which would mean thinking long and hard about urban self-sufficiency, without exploiting other people, things (natural resources & ecosystems) or active relationships from distant locations. How this might occur... is somewhat beyond me under our current globalizing (and marginalizing) capitalist system. However, a better understanding as to how this could occur would require a substantially greater appreciation of complexity.

Appreciating complexity is mindfulness. It would mean making mental connections with our actions, tracing them to their sources and striving to understand their full consequences (i.e. when investing in stocks – who or what is affected?, throwing away food – where is it going?, buying directly from a farmer – an organic label still marginalizes all the qualities of complexity). It would mean actively expressing the willingness or openness to value (not monetarily - this is a reductionist frame) everything (even things, perspectives or thesis narratives we may disagree with, especially that which cannot be compressed into an economic lens: a smile, a hug, a farmer who stayed up all night taking care of the well-being of an animal) and actively working with people, places and things.

Arguably, we still have to make decisions but when I say 'stop marginalizing
complexity,' it is not a good vs. bad decision. It means taking a little more time to reflect and look, “between things.45” Understanding that these farmers spend the majority of their 'clock-time,' living lifestyles that require 'nature's time,' we could definitely take pointers from them on how to begin appreciating complexity.

Epilogue: Hästa Gård and beyond...

“The complex system approach cannot explain to us what life is. But it can show us how complex and sensitive life is. Thus it can help us to become aware of the value of our life” (Mainzer 1997).

There is nothing quite 'universal' about Hästa Gård. It is simply unique in so many ways. After writing this thesis, I've come to my own conclusion that if I'm going to talk the talk, I need to walk the walk and get my hands dirty by plant arugula and kale by every student and professors windowsill if I decided to come back to academia. I spent a little over a month on a farm living the 'lifestyle,' and frankly have no idea what the rest of the seasons are like (other than accepting that winters in Sweden are cold). While I was looking for sustainable solutions I found some areas I would like to pursue by the recommendation of F4 and F5, primarily based around permaculture (philosophically following in line with complexity thinking), traditional farming and woofing. My next goal is to begin gathering contextually specific, traditional stories, practices and connections to the culture of local/regional food production.

45 Latour (2005)
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Appendix 1 – Theories & Methodologies

This sections proceeds first with the theories that were incorporated and then a first person account of the categorization process (seen in figure 1)

THEORY(S)

Grounded Theory: Part 1 of the Methodology

Before using the all-encompassing Complexity Theory, I must explain that I started this thesis under the guidance of Grounded Theory (Strauss 1990) and tried employing it when I had begun my fieldwork. Counter to many theories which entail entering the field with an established thesis aim and question, grounded theory is based on creating a foundation of theory ‘grounded’ in data and information accumulated from the case study.

During the fieldwork the researcher plays two roles, data collector and data analyzer, simultaneously. As data is collected, in any form (observations, interviews, notes, documents, budget sheets, articles), it is sorted and ‘coded’ into clusters of themes and then categories with commonalities. As the fieldwork progresses, the problem(s) or issues become more obvious to the researcher and are grounded in the details and data.
that have been collected and coded. As coding continues, the established categories, now more focused, reach a saturation point to validate and verify the choice of research aim, the question that is asked and the details the illuminate an answer.

Under Grounded Theory I was able to get to the point of categorization for part 1 of my methodology but I had already begun analyzing and calculating 'problems,' that I had assumed were 'problems,' at an early stage (by my second category). Cost/Benefit analyses and comparisons were frequently employed for quantitative calculations regarding: the numbers animals the farm possessed, the quantity of meat Swede's were consuming, annual farm budgets – all calculated in some temporally comparative way. By the time I reached part 2 of my chronological methodology, I was going back to open up the 'compartmentalized' categories in part 1. The synthesis required me to dig up data that I thought I would not be using.

The syntheses will be briefly described due to their chronological relevance. The application of each theoretical framework will be more understandable once they have been read chronology.

“The novel combination of available building blocks is often more flexible than trying to anticipate each possible situation with a distinct strategy or resource”
(Holland, 2002)

Theoretical 'mash-up': part 2 of the Methodology

1st Synthesis – Multifunctional Driver Analysis

The first syntheses in part 2 follows in line with what Caron (2008) would call a 'market regulation approach,' with elements of actor-oriented and public relations approaches. The analysis is limited within the policy based framework of what the WTO, U.N. and E.U. would call the multifunctional 'drivers' of a farm. The drivers are organized into ecological, economic and social functioning themes and listed under two
tables: 1) what I believed were drivers and 2) what the farmers may have believed were drivers. However, the process was halted part way through due to the problem of scale, overlapping in functionality and my own reflexivity (I began to wonder if I needed to incorporate every worm as a 'driver' for the farm's multifunctionality). Detailed descriptions of the drivers can be found in the end of this appendix, as well as their incorporation in synthesis 2 and 3.

2nd Synthesis - Timeline and Linear Narration

The second synthesis in part 2 begins to take on the shape of a polyocular visual (figure 4), but with a linear narration over space and the time of the last 100+ years. It has a heavy influence from some complex (adaptive) system theory approaches; Resilience Thinking, Transition Theory and, do to its historical investigative requirements, I tried to depict what Crumley (2003) has called 'heterarchy' (though I recognize that my representation does not do the word justice) with a recognition of power dynamics. Much has been written about the theoretical ability to promote 'sustainability' under the first two complex system theory approaches.

Resilience, the capacity of systems to absorb shock and remain in the same basic form, shape and function (Hollings 1973). Resilience can be perceived as either good or bad - depending on the scale of the system, 'thing' that you might be looking at and/or the perspective you might be looking from. Resilience Thinking was founded in the natural sciences. I began using the theory because I was inspired by the extensive work of Darnhofer et al. (2010) and Milestad (2003) regarding farms. They had both looked into the application of Resilience Thinking, sustainable farming and theoretical scale interactions, over space and time. But in wanting to explain power differentiations I sought out alternative approaches after two of the farmers I had been interviewing, bemoaned the fact that globalized food prices were substantially effecting their sales.

The use of Transition Theory was recommended for the studying of multifunctional farms by authors already mentioned (Wilson 2007, 2010, Renting et al.
2009). The theory has its roots in the social sciences and delves extensively into changing 'social perceptions' of the functionality of a farm and also emphasizes a focus on the multifunctionality of the geographical space (or farm) at different scales (global, national, community, local) (Wilson 2009). The theorists give a spectrum of analysis correlating multifunctional farms to being either highly productionist, meaning less or 'weak' multifunctionality (more monoculture, high inputs, short term profits, bad for biodiversity, economic driven farming) or non-productivist, meaning high or 'strong' multifunctionality (more diversity in production and work, promoting biodiversity, very little emphasis on food production) (Wilson 2007). Transition theory helped in my understanding of Hästa Gård because of its emphasis on starting with a geophysical space that changed in functionality. The problem, however, was with geophysical boundaries in the urban context. If I was going to incorporate data on Hästa Gård's business I would need to be able to use a permeable lens - the farmers, their animals and the activities and interactions that they conducted were not, in anyway, anchored to the geophysical space of the farm Hästa Gård. However, by focusing on the historical functionality of the space of the farm, I was able to use the area of the farm as a spring board to describe other interactions. Geographic space seemed to be a good place to begin my analysis.

I began to sort historical data and, as I admitted earlier, I stumbled across the word 'heterarchy,' which became a 'comfort term' in helping me to accept that there did not always have to be a linear hierarchy to the data that was being assembled across spatial and temporal scales (Crumley 2003). Although, there could be hierarchies (i.e. top down policies) found within the heterarchy of data that 'flowed' across scales of space and time. This meant that I was butchering the meaning of the word in the 2nd synthesis (Appendix 3 Figure 13). 'Heterarchy,' with the help of some other actor-network based theories and literature, inspired the 3rd synthesis.

3rd Synthesis: Non-linear Narration

"Relevance, like everything else, is an achievement. A report is interesting or not depending on the amount of work done to interest, that is, to place it between
As I will elaborate on further through the text, this synthesis highlights the connections of connections that do not follow a linear pattern but feedback into themselves. It is a story that hopefully reveals some of the invisible dimensions between the beams of light. I wrote the majority of it before I had read into Complexity Theory because I could not help myself in wanting the farmer's actions to be understood as what they were, relevant. As I began to learn more about the complexity of the system, it became not only relevant to me, it made complete sense and needed to be told but in a way that made sense to others. A linear narrative did not quite explain this relevance, only partially, and it was a different kind of relevance.

Above all, this synthesis (and thesis) is Actor-Network Theory (ANT) inspired. Actor-Network Theory is (/was) considered to be 'assembled' by the Science and Technology Studies (STS) scholars Law, Latour and Callon. The theory is based less on explaining why and more interested in understanding how. Polyocularity\(^{46}\) employs aspects of ANT (as was mentioned above with the use of 'actants'), and in becoming interested in Polyocularity's application, I was drawn to ANT and the 'sociology of assemblage' (Latour 2005). The theory is a non-theory, and more of a way to understand. It looks for dynamic networks and feedbacks, much like Complexity theory, but only defines 'reality' based on the conceptually 'concrete' Actor-Network actions (actants) that we, or others, experience and re-experience (i.e. much like the cow example below under 'translation example' in Appendix 2). If something is forgotten, it ceases to exist. If somebody is called a 'farmer' but I have mapped out actants of tree felling, I might decide to use a different title to identify the habits based off of my interpretation of that person's actants, but even this could be dependent on the season, perspective, mood, etc.). That is, Noe recommends the employment of a polyocular ('many' 'eyes') framework (2007), which strives to add differing perspectives (from different disciplines) of a farm’s functionality into one polyocular perspective. As he points out, “Disciplines have a one-dimensional way of recognizing, in order to be able to specialize. Consequentially, if the sciences are to reach a multifunctional understanding, they have to mobilize their observations as ‘actants’ (Latour (2005) labeled ‘actants’ - as human or non-human actors that take the shape that they take, based on perceivable actions that take place between them and a network) in multidisciplinary communication.”
nothing is a 'given,' we cannot accept anything as it is until we can find an *actant* to describe it and reinforce its description, *artifacts count.*

I was inspired by ANT because of its emphasis in the unrelenting drive to achieve objectivity with the humble understanding and recognition that everything has the possibility of contestation. It was only through ANT’s ‘scholarly’ recommendation to follow “controversies” or “messy objects/realities” within scientific research, to regard the actions, or the ‘artifacts’ left by actions, as illuminative descriptions of the objects in focus and its insistence on *relevance,* that I decided to proceed with this form of a thesis (Latour 2005, Law & Singleton 2007).

**METHODOLOGY**

**Category 1: Farmer and worker semi-formal interviews & Histories**

The first people I interviewed on the farm were not farmers but members of a municipal organization who worked on the farm. I introduced myself, my original intent and that I was curious to understand their role on the farm. During the first week, this set the stage for a series of questions I asked to every individual who worked on the farm (table i). I chose not to incorporate more details of the workers because I had decided that my focus was to be placed on the farmers.

**Table i. Farmer/Worker Questionnaire**

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<table>
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<tbody>
<tr>
<td>1)</td>
<td>Where did you grow up? (And what was it like? Family? Friends?)</td>
</tr>
<tr>
<td>2)</td>
<td>Why did you decide to move to Stockholm? (if you were not from Stockholm)</td>
</tr>
<tr>
<td>3)</td>
<td>What eventually led you to Hästa Gård? or</td>
</tr>
</tbody>
</table>
Table ii. Coded Interview responses

Speaking with the municipal organization employees had me asking questions about other organizations collaborating with the farm, who they were and how they all might contribute to the cultural services of the farm. Due to the fact some of the people I interviewed were not comfortable speaking English, I recorded most of the Swedish interviews on my iPhone and/or took notes on a smaller pad of paper.

Interviewing the farmers or farm workers took place at their convenience and usually during times when they were driving (trucks or tractors) or we were eating lunch. At first, most farmers seemed curious yet hesitant to be interviewed. Once I explained that I was offering them free labor, was interested in everything they had to say about farming, their reasons to farm and had the intent to write a research article about urban farm cultural services (which needed further elaboration), they were more obliged to tell their own stories, interests, goals and visions of the farm.

At the early stages of questions I began writing a history of the farm based on the farmers’ historical narratives. I came back to these narratives later in order to understand
other relationships of the farm’s functioning but placed their information under the first category.

Worker 1, 2 and 3 were all employed by Dagliga Verksamhet, a national program run by local municipalities that employed them as caretakers for mentally changed individuals. All of the workers were not from Stockholm but moved to the city for work or for the novelty of the metropolitan. They collaborated with the farm because the organization 4-H was a non-profit

The original farm founder (F1), came from a self-employed landscaping venture before he started Hästa Gård with 4H and had some experience in certain aspects of farming. Originally skilled as a workshop mechanic, he grew up in the city of Stockholm and enjoyed working with horses, sheep, landscaping and sensitive tree felling (using his work horses for part of the labor). He never liked the idea of “four walls” keeping him indoors and says that he is motivated to work at Hästa not for the money but because he enjoys the lifestyle of working outdoors, the ability to work with animals, particularly horses, and also to help children develop an appreciation of animals and nature.

He was employed by 4H at one of its Stockholm clubs before he began to run Hästa Gård. He admitted that he had a lot to do with deciding on Hästa Gård’s location for 4H’s new farm headquarters but spent a lot of time looking around at different locations. The initial plan, set by F1 and 4H, was for him to partially finance the farm by growing organic grains to feed all the animals at the 4H clubs throughout Stockholm. Like other 4H club employees, F1 was paid by salary, but unlike most 4H club employees, he was responsible for finding his own ways to finance the farm under the conditions he knew best (other than through growing feed grains). He told me that the salaries through 4H were substantially better than what you could get if you farmed anywhere else in Sweden and that F4 and F5, coming from farming communities, knew it.

In 1995, F1 put his landscaping skills to work and began the arduous task of clearing away the brush and regrowth left untended on the fallowed land for the previous four
years. He reported that because the land had been left fallow, previous to their arrival, it only took two years for the farm to become organically certified by KRAV, rather than the average wait time of five years. He was able to pick up a lot of work doing sensitive landscaping because the natural habitat of Sweden prefers to be forest rather than farmland. F1 reported that during those first few years, the farm did not make profit and 4H had to foot the bill. Eventually he found ways to finance the farm through a spectrum of ventures that incorporated his know how.

Being a Stockholm local, he admits to having used his local social connections to grow the business and find work for his labor. He continues to specialize in sensitive tree felling and tree removal with horses, grass cutting with horses (and tractors), sheep herding with his dog Nell as well as other miscellaneous activity around the farm. He told me that he practices an organic farming technique founded in Norway but during a later interview mentioned that he does not really know how to “farm.” He has reported that he will be leaving the farm in 2011 and that he will miss much but has no regrets.

F2, from Småland, was hired in 2002, technically no longer employed by the farm, but has been working on and off the farm since then and was working during the period of the author’s fieldwork doing maintenance and machine work around the farm. I did not have the opportunity to interview him much. When I did speak with him he admitted that his interests in work were more in heavy machinery than in farming activity.

F3, from Romania, joined the farm in 2003 and brought with him skills that could be easily employed with the farm’s entrepreneurial work. He previously owned a forestry company, worked as a ‘stacco’ painter and his hobbies are intertwined with auto-maintenance and welding.

He reportedly moved to Stockholm primarily because of work availability and was hired at Hästa because of his skills. He was the only farmer to correlate his motivation to work based on his wages. During my fieldwork, F3 was observed finishing the paint of the farm manor, fixing/welding multiple vehicles, harvesting grains (under the direction of
F1) and sensitive tree felling at multiple locations in Stockholm municipality. He has also reported that he will be quitting Hästa in 2011.

F4, 29 from Småland, was hired in 2008 under the specifications of taking on the primary responsibility in raising the organic animals and doing most of the organic farming (http://vakanser.se/jobb/medarbetare+hasta+gard/). He comes from a family of farmers and studied permaculture, animal ethnology and farming techniques at Lund University. He has traveled extensively to study organic farming systems in the U.S., as well as rotational grazing methods in New Zealand. He lectures about organic farming in Stockholm and abroad.

He wants to change the way the farm is currently run. F4 reported not wanting to do as much entrepreneurial work (snow plowing and forestry) and thinks there should be more focus placed on generating profit from organic farming. He said that he was not motivated by money but by the ethics of animal treatment, respecting animal behavioral ethnology and ideals of farming self-sufficiency. In 2010, F4 decided to cut his salary in half so that F5 could be hired to help him build a stronger financial foundation in sales from agriculture, rather than entrepreneurial activities.

F5, 28 from Småland, first interned at Hästa in 2009 and was eventually hired to work primarily with F4 on farm-oriented tasks, in 2010. Before working at Hästa she interned with one of KRAV’s founders at Husa Gård in 2008 due to her interest in organic farming.

She comes from a family of organic farmers and has actively studied organic farming techniques and methods of permaculture. She has a shared vision with F4 in that she is not motivated by money but by animal ethics and methods to enable sustainable farming function on Hästa Gård.

Category 2: Urban Farming for Food Security

On multiple instances, I recorded; a fluctuating number of hectors managed by the
farmers, machines in use and number of animals on the farm. After I visited a few of the off-farm landscaping sites, I began to realize that the fluctuating number of reported hectares was partially due to their livestock landscaping ventures that took place off the farm (Results - map 3).

The fluctuating animals reported made me question my own human error but, coupled with my three visits to two different ‘organic’ slaughterhouses with the farmers, led me to ask about animal fertility, the number of animals the farm slaughtered annually, how much it cost the farmers to slaughter each animal and what the policies were regarding slaughterhouses. I was able to observe the whole slaughtering process, receive cost/price spreadsheets and I made a table listing the farm’s different animals (table 2). I was able get an estimated average number of kilos for each animal type (cows, lamb, pig etc.) would provide by using an estimate that F4 told me. I took each average and multiplied it by their estimated number of animals annually slaughtered (table 2).

All of this information, along with a substantiated amount of literature I had reviewed on urban food security, eventually led me to search Sweden’s Agricultural Department website (jordbruksverket.se) in order to conducted quantitative calculations on how the farm might contributed (or not contribute) to urban food security in Stockholm. I decided to measure this by asking the question: How many people in Stockholm can this farm feed? To answer this question, I conducted a quantitative food production analysis comparing statistics of this urban farm’s reported total annual production of meat (in kilos) with the average consumption of a meat eating Swede, according to the national agricultural agency (Jordbruksverket and ssb.se) (table 4).

At the time, the results from the estimates of people fed by this farm seemed excessively low for the amount of labor I saw being put into the farm. When I revealed these numbers to the farmers (which I accept was a not-very-objective-action), I was partially surprised by their response. F4 told me that he wanted to triple, if not quadruple their herd of cattle.
All in all, the fact of the matter was; the farm was able to function economically (reportedly quite well) regardless of the numbers I had calculated and – it didn’t seem to have been a ‘problem’ to the farmers until I brought it up in quantitative details. I wanted to know why this was the case.

**Category 3: Ecological Functioning**

From the farmer’s response, I wondered two things; 1) Which characteristics must a farm possess in order to be called a ‘farm’ (is it defined by production, sales, labor, aesthetics?) and 2) whether quadrupling their cattle herd was a geophysical, biological and legal possibility under their reserve regulations? The first question reminded me of literature by Theodore Adorno and Walter Benjamin from the Frankfurt school, arguing over the ‘authenticity’ of music with a large emphasis placed on time. This reference led me to think about the farm as not just a farm but an entity that was functioning in multiple ways over space and time.

In order to answer the second question, I needed to find some new data; 1) What are the reserve’s policies in regards to farming, biodiversity and/or ecological functioning. I felt that I needed this data for comparison one way or another. 2) Is there an assessment of the farm’s current biological/ecological functioning? 3) Is there an example of a similar farm in Sweden that could give me an approximate idea of a limiting number of cattle per hectare based on the same culture reserve policy criteria?)

**Category 4: Governance and Power Scales**

Searching for reserve policies led me to more questions for the farmers and searches on Stockholm’s municipal website regarding the governance of the farm. Who made the rules about what they could and could not do (as a NGO business and as a farm)? And how did these rules, regulations and/or policies effect their farming production and profit?
I began to draw a hierarchical Governance Outline from incorporating the farmer’s interviews and my web-search results (eventually to become figure 9 with further details visualized in the timeline (See below)). I incorporated the major institutions and organizations (from my current knowledge) that directly or indirectly affected the geophysical farm and the business of Hästa 4H Lantbruk. Did the institutions and policies affect the autonomy of the employees (or not)? How did the employees themselves affect the institutions, farm business or even each other? I began to sift through my current collection of data and interviews in order to locate and validate aspects of farm leadership (which I addressed more significantly later on).

Category 5: Farm Energy Flows and Sustainable Farming Solutions

While I was thinking about urban food security, I began to also think about the vulnerabilities to urban food security. What were the external inputs this system required in order to be able to function in the first place? As I mentioned previously, the first few days I found myself spending a large portion of time in vehicles traveling to multiple locations throughout Stockholm. I began to wonder if these locations could be reached without a vehicle, which had me drawing the locations on a Google map (map 3).

I did this in order to keep track of all the places we drove to and the purposes of the visit and/or business affiliation (I did not include the location of the military base because I was ‘sworn to secrecy’ by the Swedish government officials. I also did not include the locations they conducted forestry because of the substantially high number of sites). I wondered how much time was spent getting to and from and how much profit they made from each location.

The vehicle driving led me to ask questions about resource use, fuel consumption, largest input costs and ‘sustainable’ solutions that they had come up with to address these costs. The search for solutions brought my attention to the context of the farm’s location. I discovered that only some of the solutions could be applied in the climate context of Sweden. This refocusing was partially due to some of my observations of the projects the
farmers had already begun.

**Category 6: Ethnology**

Their answers threw in another complex variable; solutions that would respect the **ethnology** of each animal, (particularly ruminants) under the context of the regional climate of Sweden and show cased this under some of the projects they had been working on (table iii & iv). Observationally, I wondered out loud, how they felt about the ethnology of their *own* function? That is, sitting in vehicles (tractors or trucks) most of the day.

**Table iii. Descriptive Ethnology of Ruminants (Given by F4)**

<table>
<thead>
<tr>
<th>The farmers explain that the reason for the animal rotation is that the process somewhat mimics natural processes of ruminant animals and is good for the native grasses. When one looks at the behavioral pattern of ruminants, one finds that they will not stay in the same location for long but will roam to where more food can be found. This rotational grazing process not only feeds the animals but also allows the grasses to regenerate and reduce bush overgrowth.</th>
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<tr>
<td>The farmers explained that the cows and sheep have differentiating, hierarchical selectivity in the types of grasses they choose to eat. If they are left in the same pasture for long periods of time, the animals will consume grass in their order of preferences and then will proceed to re-graze the lower-nutrient, new growth of recently grazed grass. This process makes the native grasses vulnerable to surrounding weed overgrowth. The farmers admit that in order to give the grasses the best re-growth scenario the animals should be rotated daily but they report that this process would be highly time consuming for the farmers.</td>
</tr>
</tbody>
</table>

**Table iv. Multifunctional Projects Farm Projects**

*a. The Greenhouse Project*
A multi-purpose greenhouse was built in 2009 to house the wintering egg laying hens. The greenhouse provides warmth during the winter months, allowing the hens to receive the few hours of sunlight and protection. The hens are fed and provided hay during these months and in turn, naturally provided and spread their fertilizer in the greenhouse. During the spring and summer, the chickens are moved outside and the greenhouse, being self-fertilized by the hens, is ready to grow crops.

*b. The Pig Project*

| For the 2010 Spring and Summer, Hästa raised ten pigs. They lived outside and were completely fed by recently expired ICA food. The feed was not always organic but it was free. The farm was doing ICA a favor by taking their waste which ICA would be required to pay in fines to the municipality and ICA was doing the farm a favor for providing free feed to the animals. |

*c. Moveable chicken coup project*

| Throughout the greener seasons, approximately 150 non-heritage, meat-only chickens are raised, at a time, in one of the paddocks within three fully protected moveable chicken coups. F3 explained that the concept was to gently prod the chickens to move themselves rather than have to personally move the manure by hand. The super-light, hand-movable coups are shifted every week, along with their mini solar powered electric current protective wires. F4 says that the reasons for using fast growing, non-heritage chickens are due to Swedish salmonella regulations and industry competitiveness. Slow growing broilers require three times the feed to reach a point in which they can be slaughtered and it does not make sense economically. However, he admits that the non-organic chickens tend to get sick more easily and die. “It’s as if the natural ethnology of the animal has been bred out of the chicken. They can only survive when they live inside at the perfect temperature.” F5 agreed with F4 when he said that, “We’re trying to set it up so that eventually the goal is to get the animals to do all the work… But ‘work’ in such a way that we’re respecting each animals’ ethnology.” |
This brought the conversation and questioning back into optimal ruminant grazing patterns and how governance regimes affected this relationship as well as farmer labor time. How did the spectrum of governance, covering the farm’s ecosystem and ecology, function under all its laws, rules, regulations and requirements and how did they affect each other? Was the relationship mutual or contraindicative or both (and over what period of history)?

**A Forced Pause for Reflection**

My fieldwork was cut short in October due to a farm related injury that necessitated a surgical operation. I ended up flying home to Seattle, WA for the surgery and for a few other reasons. Before I flew home, I began to consolidate the patterns that had taken place during my research in the field.

**Visiting and Comparing (Peri)Urban Farms**

Before I flew home to Seattle for surgery, I began to search for a Seattle based urban farm, if any, with similar characteristics to Hästa Gård in Stockholm. With Von Thüren’s agricultural energy efficiency model in mind, the largest three variables I was looking to satisfy were that it was 1) organic (by similar standards to Hästa) 2) had an mixed diversity of plants and farm animals (like Hästa) and 3) was the closest farm to the city (meeting characteristics from 1 and 2).

A few days before my surgery I visited Chinook Farm, not far from the city of Seattle, WA. My questions were based on the history of the individual farmers and how they addressed (if they addressed) issues of urban metabolism, food security, innovative projects (and their sources), food distribution (where were their consumers located and how did they distribute?) as well as how they addressed solutions for similar problems
that Hästa Gård experienced. The farmers at Chinook, like those at Hästa, were exceptionally polite and extremely accommodating with their time in order to explain their situation.

Though when I began to sort my data into typologies for comparison, I felt dumbfounded at my original choice in comparative variables. The three overlapping concepts I had chosen did not take into account that the climate contexts, policies, incomes/currencies and habitats were completely different (which would obviously affect a large part of the comparison). As much as I chose not to make the comparison part of this thesis, these contrasting aspects had me realize the specificity of the farm, which led to further questions about the theoretical idea of comparing farms. Can anyone really make an honest comparison with so many variables playing a role?

Once I became physically restricted from any type of physical fieldwork due to the surgery, I began to reflect and compare the narratives of the farmers at Chinook Farm and Hästa Gård. Though there were many gaps in my understanding as to how each farm system functioned, the two largest gaps I found in my data on Hästa were;

1) How exactly, was the farm able to function economically? I had estimates from the farmers but was not quite able to answer the question; how autonomous were the farmers? Particularly in relationship to the business 4H? And in what way could this relate to how the farm functioned or how they chose the work they conducted?

2) Could I find information to fill in portions of history that I’m unclear about? And could I begin to sort all of my data over time-scales?

**Category 7: National and Regional Urban Farming History**

I decided it was more rational to first pursue my curiosity of Sweden’s urban agricultural history and then try to get annual budgets when I returned to Stockholm, Sweden. My new bed ridden focus was answering the question of how could the History of Swedish *urban* agriculture fill the gaps of knowledge on a combination of previous
categories. Could this history help to explain changes in urban food security, metabolic energy flow, governance regimes, farm-business history (explained through the interviews with the farmers) and individual decisions made by the farmers?

I looked into the agricultural aspects of Sweden’s historical urban landscapes, Stockholm’s urban planning, cultural heritage sites and its relationship to the E.U., Swedish landownership and ecological vegetation changes in relation to the country’s changing soil quality.

I began to place some of the relevant knowledge in the historical timeline I was devising (eventually Appendix 3 figure 13) but did not know how to incorporate the majority of it - even though it seemed highly relevant for my case. I decided to disregard my previous attention placed on Von Thüren’s model after reading a thesis on the history of Sweden’s urban food production before 1900, its relationship landownership and an exchanging of emails with the author of the report (Björklund 2010).

**Category 8: Annual Budget**

I had already begun to connect the dots between major themes but sought after an economic budget sheet in order to go over the finer details of the farm’s operations and validate some of my inferences. I showed up on the farm in a sling and the farmers not only gave me their annual budgets for 2007-2010 but a whole lamb for all my volunteer services in the fall. I began trying to piece together the budget but had major short falls – I could translate the Swedish but could not identify where the money came from or went to from the categories listed.

At this point, I again took a very active participatory role. I did this for two reasons: 1) I felt that I significantly needed the economic details in order to be able to make cross-comparisons with other materials I had gathered 2) To my biased analysis, the farmers were overworked, if I could make their jobs a little bit easier, I should do it out of
my own goodwill. In December I created an online CSA (Community Supported Agriculture) email list connected to a spreadsheet. I emailed this document to the farmers. They could email out a list of what they had to offer and whoever replied, would have their order details automatically recorded on the spreadsheet for the farmers to review, charge them and deliver. There was never an agreement from this point on, the farmers were excited about the spreadsheet and they helped me translate the rest of the annual budget into details I could better understand.

Cost/Benefit Budget Analysis: Farmer Livelihood

Once I understood the copies of Hästa 4H Lantbruk AB’s annual budgets, I wanted to know, in percentage, how much certain jobs or payments, contributed to the total income of the farmers livelihood. I separated the total income into livelihood themes already presented in the budgets: Agricultural Production, Farm Social collaborations, Governing Policies, Integration of Entrepreneurial/Farming Services. I then converted all of the monetary numbers into percentages (table v). I did this in order to understand the benefits of certain livelihood functions and what percentage these functions contributed to the total income of the business.

Table 5 was very informative in regards to which activities were bringing the most amount of income but neglected to address the issue of costs in relation to the benefits. I wanted to know how much the agricultural activities were able to pay for themselves. I wanted to know this because I was still concerned with the authenticity of a ‘farm.’ Could I still call it a farm, if the farming was, in no way, paying for itself to function?

I quantitatively compared agricultural production alone and then with agricultural benefits/services (i.e. all the policies and economic profits that came with the act of farming) against all farming costs (Table v). Answers in Table v led me to test more questions regarding the cost/benefit of entrepreneurial activities and farm-business functionality.

Table v. – Cost/benefit analysis of farm functions
### My point for this comparison

All other farm costs (incorporating some smaller entrepreneurial costs that could not be separated) cancel out all of the profits that they should be making from all forms of farm aid. In the end, they are still left with a negative profit (at least for the past four years).
I compared entrepreneurial activity with all entrepreneurial costs as well as certain overlapping farm costs (Table vi). Again, I was required to incorporate overlapping farm costs because they were not separated in the budget as certain income benefits were (i.e. snow plowing (entrepreneurial) and grain production (agricultural) are two different income benefits, however their costs, the use of tractors and diesel, are recorded under the same budget costs). I did this comparison because I wondered if the farm’s agricultural productivity was actually paying for itself (after I had made the quantitative assessment of annual production in kilos of meat). My question was, how much were the entrepreneurial activities pay for the farmers to farm? And if they were, why? Did the farmers have the maneuverability to change this (or did they want to)? While I was making this distinction, I was able to add more understanding to many of the categories I had already created regarding costs and; 1) Farm Energy Flows or 2) payments in relationship to Governance and policies.

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurial income</td>
<td>3,227,000</td>
<td>3,435,000</td>
<td>4,144,000</td>
<td>2,761,000</td>
</tr>
<tr>
<td>Entrepreneurial costs</td>
<td>-1,254,000</td>
<td>-1,138,000</td>
<td>-1,494,000</td>
<td>-683,000</td>
</tr>
<tr>
<td>All other farm costs (including tractor use on the farm); oil, electricity, machine maintenance etc. (not including animal costs)</td>
<td>-1,046,000</td>
<td>-1,233,000</td>
<td>-1,320,000</td>
<td>-1,301,000</td>
</tr>
<tr>
<td>Remaining</td>
<td>926,000</td>
<td>1,064,000</td>
<td>1,330,000</td>
<td>777,000</td>
</tr>
</tbody>
</table>

My point with this comparison- Entrepreneurial income alone can cover all the
remaining indirect farm costs AND almost pay for all of the farmer’s salaries – every year (compare the highlighted numbers to those below). Economically, entrepreneurial jobs are substantially more profitable than all farm related profits.

| Cost of employment that year | -1,071,000 | -1,203,000 | -1,048,000 | -1,001,000 |

**Syntheses – Trying on Theories**

As stated previously, I had begun a continual comparison of data and information in order to discover issues or problems I could possibly focus in on and target as my thesis question. The more I dug deeper to understand the first perceivable problem, the more I discovered that the foundation of the problem was woven into another problem that consisted of its own foundation. That is to say, I was finding ‘controversies’ within ‘controversies.’

I felt that I could not base my thesis question on the first problem I quantitatively calculated (‘urban food security’), because it seemed to be covering up a multitude of other problems. I needed to find and address the keystone of the urban farming system’s foundation. The ‘foundation’ of the first problem, however, led me into a web of interdependent variables all seemingly functioning together over time and space (Figure 3). The ‘keystone’ problem was a web of interdependent variables that could be addressed in a plethora of different ways depending on how one defined a “problem” and at what scale one was looking at or from.

This is when I began to look for theory-based concepts like “poly-functional” or “multifunctional.” If I was going to use a theoretical lens, the lens needed to allow me to showcase the farm’s multifunctionality.
Appendix 2 – UNEP Multifunctional Drivers

1st Synthesis: UNEP Multifunctional Drivers

Perhaps the most intriguing aspect of the farm to me was the longevity of farming that had continued to take place on the same plot of land. The farm was still functioning or at least looked and felt like it was functioning as a farm. The land was not paved over and developed, yet was surrounded by development on almost all corners. I wanted to see if I could find a lens that would allow me to label the forces that gave the farm its ability to function, what where its ‘drivers’ or ‘driving forces?’

While searching for a way in which to portray the multi-poly-functional drivers of this farm, I found a trove of literature covering multifunctional farming. The UNEP and WTO had both written extensively on what a multifunctional farm was and how it was able to function socially, ecologically, and economically. However, from what I could tell, not much had been written about the driving forces of a multifunctional urban agriculture/farm (MUA). The few resources I could find that discussed multifunctional urban farming/agriculture were primarily analyzing other case studies and were discussing the need for a typology of driving forces to be able to compare MUAs.

I set out on to fulfill this need and began recording any type of driver that enabled or allowed the farm to function. I tried to separate my data into two lists, one list was of the farmer’s perspectives of driving forces and the other list was my own interpretation of driving forces. There was no problem in coming up with a vast list of drivers, in fact I found it difficult to try and limit the number of drivers. But the larger problem began when I tried to group the drivers under the three specific themes listed by the UNEP. That is, when I tried to place these drivers into the categories: social, ecological and economic functionality. Many of the functions did not fit in only one, or sometimes, any of the functions (Table vii. Results).
### Table vii. (Condensed Version) Multifunctional Urban Farm Drivers (The written out version is below)

<table>
<thead>
<tr>
<th>Farmer</th>
<th>Economically</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1) <strong>NGO</strong> – 4H, bailed the farmers out when the farm first started</td>
</tr>
<tr>
<td></td>
<td>2) <strong>Farmer agency (vision and skill)</strong>, each employee contributes financially to the farm through their own expertise.</td>
</tr>
<tr>
<td></td>
<td>3) <strong>Motivation to farm</strong> – “not about the money, it’s about ethics.” Motivated by ethics of animals and the lifestyle of farming (working with agriculture), not motivated by money. So will do what needs to be done in order to farm.</td>
</tr>
<tr>
<td>Socially</td>
<td>1) <strong>Reciprocal Community Services</strong></td>
</tr>
<tr>
<td></td>
<td>2) <strong>urban connections</strong></td>
</tr>
<tr>
<td>Ecologically</td>
<td>1) <strong>KRAV</strong></td>
</tr>
<tr>
<td></td>
<td>2) how the ruminants graze - Ethnology</td>
</tr>
<tr>
<td></td>
<td>3) because of energy efficient multi-functioning systems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Author’s Observations/Literature review</th>
<th>Economically (with direct reference to their Annual Budgets from 2007-2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1) <strong>Agricultural production</strong> – Directly, agriculture is more costly than productive. Indirectly, agriculture is mildly profitable.</td>
</tr>
<tr>
<td></td>
<td>2) <strong>Governing policies</strong> – that emphasize 1) urban park space for community 2) protecting biodiversity and finally 3) cultural heritage = cultural reserve. How? = <em>willingness to pay</em> for animal landscaping (See figure 5-9)</td>
</tr>
<tr>
<td></td>
<td>3) <strong>Social Collaborations – renters of the land</strong></td>
</tr>
<tr>
<td></td>
<td>4) <strong>Integrating Farming with off-farming entrepreneurial skills</strong>: The farm is and has been highly dependent on external economic functions from its inception because of a. biodiversity/landscaping priority from policy b. farmer’s individual skills (buffered by policy)</td>
</tr>
<tr>
<td></td>
<td>5) <strong>High use of energy inputs</strong></td>
</tr>
</tbody>
</table>

| Socially                                                                 | 1) **Urban social programs** a. Dagliga Verksamhet b. Studie Framjandet c. kriminal department. **What allows and enhances the ability of the farm to function socially** |
|                                                                        | 2) **Farmer perception**                                                                      |
|                                                                        | 3) **Swedish Miljömål** protects the cultural heritage which gave reason to create the reserve 5) 4H’s community involvement |
|                                                                        | 6) Oloph’s community speeches                                                                 |
| Ecologically | 1) Governing oversight-continual assessment - It promotes the ecology of the region because 1) it was founded on restoring High Value Farmland (joining the E.U.) and 2) it is required to do so by two different institutions with similar rules – KRAV, reserve regulations. There is a huge emphasis placed on biodiversity of grazed grasslands (which paradoxically reduces farm production output).

2) Ethnology of Ruminants

The scale – If we look at how the natural functions of the farm and ask the question is able to function ecologically, the animals, plants the urban farm is able to function ecologically because the municipality, the country and city have valued the ecosystem services enough to preserve the biodiversity of the region from urban development. However, it is able to function because of the heavy use of external energy to power tractors and machines that maintain the land.

- All adaptive off-farm entrepreneurial activities are dependent on external energy sources |
### Multifunctional Urban Farm Drivers

*(the longer, written out version)*

<table>
<thead>
<tr>
<th>Group themes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2) It’s role as a green space, part of Stockholm’s green wedges</strong></td>
<td>(biofuel for tractors (not produced on the farm), fuel for chain saws)</td>
</tr>
<tr>
<td>1) Based off of the history, budget reports and interviews, the farm has functioned more as a park/cultural reserve from 1995 to the present. It has emphasized nature conservation with very little focus on food production as an economic means in itself (until recently). It has been financed by outsourced landscaping and entrepreneurial activities, which often have a direct relationship to agricultural activities</td>
<td></td>
</tr>
<tr>
<td>2) It is able to function because of governing policies that allow it to 1) physically be in the city 2) have an added value; This has primarily to do with governing policies that find more value in the green park landscape, biodiversity, cultural heritage and ecological corridor function than in striving to create possibilities for the farmers to be multi-functional with the land (as of yet)</td>
<td></td>
</tr>
<tr>
<td>3) Farmers motivation - Because the farmers. And their specific ethical motivation rather than money motivation (unlike city farmers in developing countries, these farmers are doing quite well financially, but not well compared to other city dwellers)</td>
<td></td>
</tr>
<tr>
<td>4) Contradictions – 1) It must function under policy contradictions – the city and municipalities have a willingness to pay for the natural grazing of animals in the city but its function as a meat producing urban farm is compromised by the distance the farmers must drive their animals outside of the city in order to be slaughtered 2) ethics contradiction – the farmers talk about animal welfare but the author observed that most of the food eaten on the farm was not from the farm – they can receive more money selling their food than eating it 3) complicated double standard by the state, i.e. we want you to only work 40 hours a week and remember to take off vacation time – However, Animals don’t go on vacation from needing to be fed. How can you work part-time as a farmer?!</td>
<td></td>
</tr>
<tr>
<td>5) The regulators from the municipality should be working directly with F4 and F5</td>
<td></td>
</tr>
<tr>
<td>6) (the new farmers should be given every opportunity to create a multi-functional farm)</td>
<td></td>
</tr>
<tr>
<td>7) Metabolic flow – too many eggs in too many baskets. Too many inputs</td>
<td></td>
</tr>
</tbody>
</table>

---
Economically – (their interviewed responses, see table)

1) NGOs

The non-profit known as 4H, leased the land from the municipality in 1995. The founding employer for the farm (F1) reported that the first couple of years were not profitable and 4H paid for the losses. 4H has acted as an umbrella company until the farmers discovered ways to be able to pay for the farm’s functioning.

| 4H’s primary use of the land has always been; to produce straw, hay and animal feed for all of the animals at the twelve 4H clubs throughout the city. This use of the land continues to be a required responsibility for all the employees of Hästa 4H Lantbruk. The principals of 4H and the practice of farming-based land management has been and is continuing to match well, collaboratively, with the municipality’s goal to simultaneously create urban green space for neighboring communities and support ecological conservation. |

2) Farmer Agency (Vision and Skill)

During interviews, each employee of Hästa 4H expressed a vision of how he or she wanted to see the farm functioning. Each person’s vision was directly related to his or her past experience, education, specialized skills and how they perceived themselves; as a farmer or entrepreneur (table 4).

The founding employee (F1), as well as the following two employees (F2, F3), with work histories as mechanics, foresters and landscapers - reportedly led the economic functioning of Hästa from 1995-2008 towards more entrepreneurial activities, while continuing to meet 4H’s prerequisites. Newer employees hired in 2008 and 2010 (F4 & F5), with histories and education in organic farming, wanted to see the farm economically functioning with a dependence on farming activities and have begun directing the farm’s economic functioning towards this area of focus (which can be seen in the last two years
All farmers have admitted that most of their farming activities (including the farming equipment) contribute to the highest costs of the business, which has had them looking for more ecologically sound and economically sustainable solutions. As F3 put it, “The goal is to get the animals to do all the farm work within their ethnological behavior.” In the past two years, F3 and F4 have explored agricultural projects that emphasize multi-functionality, energy efficiency, low-input and/or recycling urban waste. All of which were very profitable.

3) Motivation to Farm

All employees admitted that they enjoy the act of farming as a lifestyle and that, “it’s not about the money, it’s about ethics;” allowing animals to live ethnologically. They reported that with current slaughterhouse policies and their costs (geared towards larger farms) requiring them to drive their animals to locations out of the city (see map 2 
http://maps.google.com/maps/ms?ie=UTF8&hl=en&msa=0&msid=20562557925335818391.0004953ea260c1d7311a7&ll=59.644152,18.113708&spn=1.096582,2.469177&z=9 ), costs/repair of farming equipment, regulations from the reserve on soil and tree planting, rules from KRAV, competition with international markets with their short growing season and high food taxes; it is very difficult to be a profitable farmer under their circumstances. However, all employees report that the 70-84 hour workweek lifestyle is still worth the labor because they enjoy what they do.

Two of the farmers reportedly made their own financial sacrifices in order to enhance the farming aspects of the farm’s economic functioning. F3, who was specifically hired to take over more of the farming ventures, reported that he cut his pay in half for the 2010 year so that F4, who was also willing to receive a half salary, could be hired to help him with the farming.
4) Complex communication is not available.

**Socially – Their**

Because the farmers have been striving to create more meaning of the farm’s existence with local communities.

1) Urban Social & Community Service

a. *Dagliga Verksamhet*

*Dagliga Verksamhet* is a publicly funded organization that takes care of mentally disabled individuals throughout Sweden. On Hästa, they have approximately four caretakers and 12-15 individuals who participate in labor based activities on the farm. The organization began working with the farm as a trial and both 4H and DV saw mutual benefits and have continued the collaboration.

The people involved in DV take more responsibility for tending to the chickens, pigs and other miscellaneous activities. One of the caretakers is often given the responsibility for picking up the ICA ‘grismat’ (pig fodder) and for cooking lunch for everyone, including the farmers.

The farmers and workers employed by DV both report a positive experience for those individuals participating in the program. All DV employees said that, “under most circumstances, the individuals in the program would be indoors, possibly in front of a TV. Farm work, on the other hand, gives the DV participants (and caretakers) the opportunity to be outside surrounded by animals and nature.” The caretakers and farmers have both reported a greater sense of well-being for the participants and for themselves to be working at Hästa.
b. Studie Framjandet

Studie Framjandet is a non-profit, publicly funded, education based program. SF rents a small parcel of land on Hästa Gård and employs two gardeners who teach unemployed individuals, residing in the nearby community, how to grow organic vegetables. The organization is also teaching permaculture classes, with one of the farmers on Hästa Gård during the winter and early spring months. SF employees often cook meals for the farmers and the farmers help with some machinery plowing on the field that SF leases. They often both sell their foods together at the café in Stora Huset.

Ecologically – Their

1) E.U. CAP or LIFE for High Value Farmland
2) The municipality
3) KRAV rules

Economically (Annual Budget for 2007-2010, table v & table vi)

1) Agricultural Production

As previously mentioned, the farm is required to grow hay, straw and animal fodder for Stockholm 4H clubs, though the farm produces and sells a wide range of foods as well (table 2). Comparing the direct cost-benefits of production only (from the last four years of previous sales – table 5), farmers should be losing money by farming (Table 7). However, when all of the indirect agricultural services and beneficial governing policies are taken into account, there is much more profit to the venture of farming (read below).

2) Governing policies (Municipal and E.U.)
Hästa 4H Lantbruk receives financial support from the municipality and from E.U. farm aid. This is due to the fact that the farm plays the duel role of a high natural value farmland (HNV Farmland) and municipal park. The municipality not only leases the land but also bequeaths the job of eco-park manager to the employees of Hästa 4H Lantbruk. The farmers are paid to provide livestock landscaping and general park upkeep for the enjoyment of the surrounding communities. This same type of maintenance helps the farmers receive farm aid from the Common Agricultural Policy of the E.U.

Outside of the farm, the farmers have found opportunities to create a substantial portion of revenue through the natural services of their ruminants and horses. Nearby municipalities, towns and military bases, throughout Stockholm (map 3) hire the farmers to set up fencing in meadows/pastures and then ‘rent’ the farm’s cattle or sheep to ‘landscape’ the region by grazing. This type of livestock landscaping is said to promote a high level of pasture and meadow biodiversity and is subsidies under E.U.’s CAP. F1 is also paid to mow lawns manually with his workhorse. The only expense for the farmers in this venture is transporting the animals to the locations and making sure to check on them daily (under KRAV they are required to check on the animals everyday).

E.U. and municipal policies often promote contradicting goals for small urban farming livestock farmers, particularly in regards to slaughterhouses and costs. Direct costs to the slaughterhouses can be 60 - 70% of profits from lamb and 20% for cattle, not including the transportation costs or ecological stresses of their animals (Direct Agricultural costs – table vi).

3) Social Collaborations

Some of the building space, houses and parcels of farmland are rented to individuals and organizations. The people who rent the houses are friends of one of the farmers or in someway connected to the business 4H. The organizations, Studie Framjandet and Dagliga Verksamhet, rent the use of a building, a parcel of land behind Stora Huset and there are a handful of individuals who rent stable space for their horses.
4) Integration of Farmer & Entrepreneur skills (On and Off-farm)

The farm has been and will continue to be financed by the select skills that each farmer/entrepreneur chooses to employ within the limitations of his or her material environment. Every employee has had the leeway to explore other means of generating finances through farming or entrepreneurial activities, with the materials and resources available to their disposal within the business Hästa 4H Lantbruk.

Since the farm’s inception, the business has been dependent on the entrepreneurial skills of its employees, on and off the farm. On-farm entrepreneurial activities like forestry, lawn mowing, making cross-country skiing paths and park maintenance have been outsourced, along with related farm jobs, to off-farm locations in order to generate more revenue. Off-farm activities, that make up approximately half of the business’s total income, include; landscaping with livestock at multiple green-space city locations (see map 2), garden plowing and snow plowing with the tractors, forestry (often with horses) and building/work projects.

Entrepreneurial activity currently pays for itself on and off the farm.

OBSERVATIONS

High use of energy inputs – See farm costs. Also, all entrepreneurial activity required the energy to transport to locations off the farm. The estimated time the author spent sitting in a vehicle (tractor or truck) during fieldwork was approximately ½ to 2/3rds of the total time.

Socially

Community
The farmers collaborate with a local municipal organization called Dagliga Verksamhet. Currently, three to four caretakers supervise and give direction to 12-15 individuals with special needs who are casually orchestrated through different tasks on the farm. Both 4H and DV have seen mutual benefits and have continued the collaboration.

The people involved in DV take more responsibility for tending to the chickens, pigs and other miscellaneous activities. One of the caretakers is often given the responsible for picking up the ICA ‘grismat’ (pig fodder) and for cooking lunch for everyone, including the farmers.

<table>
<thead>
<tr>
<th>The farmers and workers employed by DV both report a positive experience for those individuals participating in the program. All DV employees said that under most circumstances, the individuals in the program would be indoors, possibly in front of a TV. Farm work, on the other hand, gives the DV participants and caretakers the opportunity to be outside surrounded by animals and nature. The caretakers and farmers have both reported a greater sense of well-being for the participants and for themselves to be working at Hästa.</th>
</tr>
</thead>
</table>

**Community understands the value of the reserve/farm**

1) many local residents visit, as well as schools, kindergardens as recreation.

2) the preserved cultural landscape gives the feeling of being in a countryside landscape

**Governing policies –**

*NGOs* - 4H creates an environment for all of the organizations to work together on the farm.

**Community** – the nearby community enjoyed the presence and maintenance of the farmland.
Ecologically

1) Collaboration with municipal institutions

According to the most recent report by Stockholm’s municipality, they are working closely with the environmental department (Swedish EPA), the cultural department, the development administration and the natural history museum to assess the ecological and cultural functions of the reserve/farmland. On the farm, they report only improvements in biological populations, diversity and exciting new ecologically enhancing projects. They also are going to reassess how pastures and meadows can best provide and promote conservation value flora. The only thing negative they report is from the construction of E18 that borders the reserve on the eastern and southern flanks.

2) High Energy Use

The whole farm is not able to function 'ecologically' by itself. However, there are many ecologically beneficial

Assessment of the Multifunctional Farming Lens

I believed that perhaps the problem with this lens was that it was to be used for analysis and application on rural farms and that because of the urban complexity, more variables had to be calibrated and accounted for before I could make assumptions on the problems or drivers of the situation. Also, I felt that I had come up with conclusions that were ill founded on my limited understanding of the urban farm’s context.
The grouping was too ridged to describe the actual farm’s function, as much as I did receive insight from making the comparisons. For example, many of the functions could not be grouped into mere “social function” because the social function was interlaced with ecological and economic function. The idea of creating ‘driving force’ typologies was a good idea - in theory - but not in practice. On reflection of my visit to Chinook farm, I had to agree with Vagneron (2003) that strict farm typologies or specific drivers could not be compared with other urban farm systems because urban farms are individually, extremely dynamic. I would argue that farm comparisons, however, do provide different perspectives and greater understanding of function because of their unique dynamic differences.

With what I had gathered regarding the farm’s drivers, I wanted to portray its individual dynamics because I felt this was something important to understand and perhaps could be used to help them in policy. I was interested in visualizing what Schiere et. al. (2004, 2006) had recommended, “emphasis should be given to a dynamic assessment of farming systems, an analysis on how and why urban farm systems change over time in form and function, and an identification of ways to support the positive aspects, and cope or counteract the more negative characteristics of specific farming systems.”

My problem now was that I did not know what to label as negative or positive. It seemed to depend on the eye of the beholder and at what scale that eye was looking from. With this scale ‘problem’ in mind, I set out to visualize first what Schiere had recommended regarding an “analysis on how and why urban farm systems change over time in form and function.” (CONTINUE IN APPENDIX 3, no longer 1st person)
Appendix 3 – Narrative Appendix

Timeline and Narrative Model explanation

“... the urban process harbors social and ecological processes that are embedded in dense and multilayered networks of local, regional, national and global connections.” - Sweyngedouw (2003)

This section is concerned with what Agar (2004) called the triad constraint. That is, as the ethnographer/narrator, it is my responsibility to create understanding within the boundaries of three different points of views – the subject, researcher and audience. This is to say, it is understood that complexity itself is irreducible to a model or a theory and so these models could not represent the full reality, nor do I expect them to. A human's mind could never calibrate for all complexity of the complexity itself. However, models and theories can drastically aid us to understand.

Interpreting the models

The models are based on 'control hierarchies' (Crumley 1995). However I gave them their titles, 'Hierarchies of Control,' before I began to read Crumley's (1995) article, which is why I have chosen to keep this original name. Every blue circle (including the bright blue circle) represents some sort of top-down hierarchical link to the circle(s) within them (via policies, regulations or control) and regarding the farm's ability to function. The farmers are at the bottom of the hierarchy.

How to Interpret the Timeline

Using Complexity terminology, Figure 13 is a timeline representation of only a small number of the actual 'elements,' interacting across temporal and spatial scales. Though they visually appear to be embedded in figure 13 (because I have modeled them as such), in actuality, many of the elements flow across scales (i.e. the gradual globalization of food prices and information/knowledge). On another critical note, there are realistically many more gold (financial support from) and blue (enabling for) lines

47Latour (2005)
that were not included in figure 4 and would not necessarily need to be related to the farm, *per se*. Again, this comes down to my own choice to include the ones I have included for better understanding for the reader. During the time I was creating this model, I will admit that I was highly focused on how the farm was able to function financially.

The background colors in figure 13 highlight distinctively traceable shifts in hierarchical political powers, either controlling or influencing, how the geophysical land of Hästa Gård has functioned under (or is functioning under) within the time span of the years 1905-2010. These shifts are represented separately (by color) in figures 8-13. Because they are top-down or have traceable control, 'from above,' they *are* considered temporally embedded and thus have been titled “Hierarchies of Control.” The text below figure 13, is made available as a simplification or condensed history but is nowhere near the full length history of the period.
Figure 13: Timeline of Hästa Gård including Hierarchies of Control.

In 1930, at the regional level, the city of Stockholm drew up its first more detailed outline of a city plan. The growth of the city followed a pattern that grew tangentially with the rail lines away from the heart of the city. Consequently this left green space in between the lines, which looked like green fingers or “green wedges.” At the national level, in the 1950s, Swedish industry was growing quickly in Swedish cities but the need for workers was growing much faster than Sweden’s population growth. Sweden changed its immigration policy to be more lenient in order to coax this industrial growth.

By 1966, the crown relinquished decisive power of local land use to the local municipalities, which rearranged themselves (e.g. Stockholm municipality used to be many municipalities but was assimilated into 1). This meant there was less of a top down approach to how land was decisively used.

For almost 70 years (from 1905 until the 1970s) the farmland was maintained by the Swedish military. Sheep grazed the pastures and an assortment of grains were grown by the soldiers. The military began to abandon the area during the 1960s-70s when the municipality gained decisive control.
1966-1991

The shift in landownership allowed Stockholm municipality to address its growing population and housing concerns. In the 1970s, Sweden's million housing project developed the land surrounding the Järvaflätet (later to become the Igelsbäcken Cultural Reserve). During the development, the city used a plot of land on Hästa Gård as a dumping site for the 'blasted' rock, debris and construction material left over from the urban developments and the creation of new subway tunnels (to Akalla, Husby, Kista finished in 77). The mound of debris named, Granholmenloppen (formally "loppen" meaning garbage), measures 30 meters high and is now covered in grass and used as a disc golf site and for urban parachuting. Reasons for why the Järvaflätet was left green after the shift in landownership had more to do with a combination of unintentional urban planning consequences originating in city planning patterns set up in the 1930s (development of the city followed a finger-like railway pattern away from the downtown) respecting concerns of physical geography and urban food production needs. As some concerns disappeared with globalization (e.g. the allocation of farmland for urban food production), others became more prominent.

Individually:

1970s - 1980s, Stockholm's cultural heritage museum began to conduct archeological digs on the Järvaflätet and found relics dating back to the Bronze and Viking age. The folklorist and Urban Historian, Sigurd Erixon, noted to policy makers that "Akalla by" was Stockholm's one of two best remaining culturally preserved farm villages. Ecologists found rare fish in the Igelsbäcken creek as well as high levels of biodiversity in the remaining forest islands.

1991-1995

Farmers abandon the farmland yet the municipality is intended to preserve the green space from development in order to keep the Järva "green wedge" in tact. Stockholm's neighboring municipality, Sundbyberg includes, in its municipal master plan, the intention of preserving Igelsbäcken in order to create an ecological buffer zone on both sides of the creek.

1995-2006

When Sweden joined the E.U. in 1995 the CAP farm aid became available to Swedish farmers, consequently the same year 4H started the farm Hästa Gård. 4H and its employees saw the benefits of this aid, as well as park aid from the Stockholm municipality (striving to preserve its "green wedges" with the 1994 Park Programme) and other benefits like urban recognition of 4H from city dwellers and the ability to grow feed-grain for its 4H Stockholm club animals. With Stockholm's growing population, a lot of debate takes place as to whether or not the region should be developed or protected.

Individually:

F1 began to landscape the farmland for organic production (a method of farming that runs parallel to 4H's mission statement). He brings with him horses and sheep to graze the land and plans on growing grains and hay to feed 4H's animals. From 93-97 the farm received 50% organic conversion payments from the E.U. but the business is in no way profitable and 4H foots the bill. By 97, F1 begins exploring entrepreneurial ventures (forestry, snowplowing with tractors) in order to make the farm profitable. The E.U. changes the CAP to focus on High Nature Value (HNV) farmland. The farm received more funds for emphasizing biodiversity and ecological preservation in their farming methods. Conveniently, this farming method is already an obligation from 4H and the municipality in order to preserve its "green wedge" as a park. By the early 2000s, the farm has acquired a small, diverse, yet continually growing herd of hardy cattle (by donation or reduced price). F1 generates profit from renting the sheep and cattle to other municipalities as biodiversity-enabling, livestock landscapers. Paradoxically, he generates almost zero profit from meat sales due to 1) the complicated slaughterhouse policies dictated by the E.U. which are not compatible with small urban farms and 2) his entrepreneurial ventures are providing quite well. He convinces 4H to hire F2 to help him with farming and other tasks. Not long after, he hires F3 specifically to help with the now highly profitable off-farm forestry and entrepreneurial ventures.

2006-2011

With the help of the E.U.'s Natura 2000, the many scientific articles published on the farmland's site-specific cultural heritage, red-listed species and the general concerns by municipality and EPA to preserve the green wedge from future urban development - the farmland becomes a cultural nature reserve. This status provides protection from development but also dictates more regulations at the farm and individual scales.

Individually:

With a growing herd of cattle, greater expectations through reserve regulations and the high labor demand in F1's entrepreneurial ventures, F4 is hired specifically to focus on organic farming (when seasonally possible). With F4's farming education and specificity, profit is generated through sales of meat with the addition of chickens and pigs and the almost twice as large, Angus steer. F5, a like-minded friend of F4, interns and then is hired to work on the farm. However, in order for F5 to be hired, F4 must split his salary in half.
Appendix 4 – Theory Appendix

### Example Translation

To give an example of the importance of *translation* in revealing complexity, let us use the semiotic example of a cow. A cow, however, is not only the word ‘cow,’ the word has very little complexity to it. But the word brings to mind complex images, understanding and functions of what a 'cow' does. The more complex and diverse a description, the better we, as observers or readers, understand its complexity.

Its perceived actions define the complexity of whatever 'it' is - *which could be*
many different things to many different people. To me, I may think of 'it' as a black and white spotted animal that produces milk. A farmer might see it as nature's lawn mower, an eventual source of meat and a consistent source of Common Agricultural Policy revenue, while an ecologist might see it as an ecological/biodiversity promoter, that is, as long as it’s alive and continuing the action of grazing. For its actions (grazing grass) is what promotes biodiversity – not necessarily its existence (as can be compared to indoor cattle, raised on corn in Concentrated Animal Feeding Operations or CAFOs).

Even when 'it' ceases to exist, its previous actions (much like an archeologist would identify them, its artifacts (Lynch 1985)) still describe that ‘it’ was alive at one point in time. However, once no trace is left (i.e. all the hamburger meat in the freezer has been eaten up) and no artifacts can be found, ‘it’ (the cow) ceases to exist in the minds of any perspective (that is, if you've been successful at forgetting the memory of all the hamburgers you ate. Though a friend may remind you of the 'artifact' left around your waist line).

**Appendix 5 – Regulations for Hästa Gård**

**Regulations for Hästa Gård**

For the public

In addition to regulations and prohibitions in the laws and regulations it is prohibited to:

1st destroy or damage the natural objects or surfaces such as by digging, drilling, cutting, carving, blasting or painting.
2nd break branches, cut down or otherwise damage living or dead trees and shrubs, as well as damaging the vegetation in general, for example by digging up plants such as rice, herbs, grasses, mosses, lichens or fungi.
3rd disturb wildlife (for example, by climbing the nest trees, capture or kill mammals or birds).
4th fish in Igelbäcken. The municipality may grant exemption in terms of fish conservation measures and scientific studies.
5th fire other than in designated and made ready in place or bring their own grills.
6th camp or go camping for longer than two days.
7th bring an unleashed dog unless the dog parks.
8th ride or drive a horse except on marked trails and areas.

For land owners / holders of special rights to property
In addition to regulations and prohibitions in the laws and regulations it is prohibited to:

1st organize storage other than for site management and for farm operations.
2nd Forest planting on open ground, except for the planting of shade trees along Igelbäcken.
3rd use chemical fertilizers or chemical pesticides, except for the control of large populations of jätteloka.
4th within 25 m from Igelbäcken or its tributaries to store chemicals, petroleum products or similar, or build compost, plowing or spreading manure within a zone of 15 m nearest Igelbäcken or 5 m nearest Igelbäcken tributaries.
5th engage in activities that lead to risk of contamination or clouding of Igelbäcken water or reduce the inflow to Igelbäcken. The regulation does not constitute obstacles to carry out actions aimed at improving Igelbäcken water qualities (eg the disposal of polluted water traffic day).
6th implant for Igelbäcken alien species, such as brook trout or crayfish in Igelbäcken or its tributaries.

Without permission from the municipality, it is prohibited to:

7th pursue quarry, quarries, or other activities that may change the area's topography and its surface or dräneringsförhållanden by digging, blasting, excavation, ditching, fill, tip or similar. Exemptions apply to such measures which aim to restore Igelbäcken or farmland, or restoration and construction of wetlands according to the attached approved management plan. Exceptions also apply for burial in a possible future cemetery.
8th carry out renovation or extension or change building uses from general purpose to residential purposes.
9th construction of new building or facility, such as cemetery, golf course, swimming, camping / camping, sports, gravel and fenced ball fields, artificial turf, catwalks, bridges, allotments or other major facility. Exemptions apply to homes in the allotment areas with building permission in the local plan.
10th demolish buildings.
11th construction of communications tower or the like.
12th construct executable path or parking lot, asphalt, or existing roads or parking lots, in addition to those listed in the "proposed changes" in the management plan.
13th draw up land-, air line or underground cable.
14th felling of forest or single trees with a diameter of 60 cm, other than for safety on footpaths and driveways.

Regulations shall not prevent the actions needed to meet the purpose of the reserve, which is specified in the approved management plan is carried out, or to smaller companies work performed, as required for the normal running of the area's buildings and facilities. The regulations do not preclude the maintenance of existing systems or air cables and roads, including the requisite off-road for the purpose and clearing of vegetation for the power lines, among other things according to established rights of way and right of way.
The regulations are not obstacles to rebuilding the road E18 and flanking measures, such as traffic diversions during the extension period, the movement of lines, construction of vägslänter, pedestrian and bicycle paths, stormwater facilities, etc., in accordance with the work plan for road E18 Hjulsta-Kista, detailed Dp1999-08897-54 and the contract drawn up between the SRA and the City for redevelopment.

Appendix 6 – CAP distribution & Old Maps

Table 5: The challenging Shape of the CAP

Taken from HSBC, Forward Planning (Jambor & Harvey 2010)

Map 6: Hästa Gård 1688