

# The quest for the perfect model: Pre World War 1. Military land use modeling of the Greater Copenhagen area, Denmark

Stig Roar Svenningsen<sup>1,3</sup> Andreas Aagaard Christensen<sup>2</sup> Jesper Brandt<sup>3</sup>

<sup>1</sup>*The Royal Library National collections department, Søren Kierkegaards Plads 1 DK-1016 Copenhagen K*

<sup>2</sup>*Department of Geosciences and Natural Resource Management, Faculty of Sciences, Copenhagen University, 23 Rolighedsvej DK-1958 Frederiksberg, Denmark*

<sup>3</sup>*Department of Environmental, Spatial and Social Change, Roskilde University Universitetsvej 1, Postboks 260 DK-4000 Roskilde, Denmark*

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Human land use practices are the single most important factor affecting and changes European landscapes. As a consequence, much attention has been devoted within Landscape Ecology to analyze changing patterns of land use and develop research strategies to understand the processes, behind these changes in order to inform policy makers. Models have become an increasingly important tool in this strain of research, partly due to the revolution in information technologies that has happened in the last 30 years. The, modeling of human decision making, however is often based on assumptions about the ability to identify structures and driving forces of a relatively stable nature, explaining or forecasting the process of change. This is not solely a modern phenomenon and in this paper we explore the way by the Danish military and government officials developed an early land use model to serve such purposes. At the end of the 19<sup>th</sup> century the Danish military realized, that they had a problem. The landscape surrounding the fortress of Copenhagen was too flat and didn't have enough fixpoints in form of landscape elements and topography to ensure a proper direction of artillery fire from the batteries on the fortifications. To fix this problem, the Danish military planned a comprehensive survey of the agricultural landscape around Copenhagen in the year 1900, with the purpose of developing a model able of predicting agricultural land use, to be used to direct and control artillery systems on the land side of Copenhagen. The basic assumption behind the model was stated by the Artillery Command of the Army: "the field systems and rotational and use practices around Copenhagen are so stable that agricultural data could be used for directing artillery fire in the future." The plan was to map every field within a perimeter of five kilometres from the front of the fortification in order to create a very detailed map in 1:10.000, complete with field boundaries, as well as register information about the rotational system. At first, the survey campaign seemed to be going very well, but the military quickly ran into problems. The rapid urbanization of the landscape north of Copenhagen meant, that farming was abandoned in preparation of development. On the island of Amager southwest of Copenhagen the farmers didn't use any fixed rotational schemes because of the supply of fertilizer from the city of Copenhagen. And in addition to these obvious difficulties, the model was also challenged because the social and economic system which was supposed to be constant, as it had been for centuries. The urbanization led to urban sprawl and technological development in the agricultural sector fundamentally changed the landscape around Copenhagen in the period between 1900 and 1930. Modeling and efforts to understand the processes in the landscapes have developed tremendously since year 1900, but this story is a good reminder about potential pitfalls of modeling with a simplistic understanding of static human processes and patterns in the landscape.