
Prognosis of Landscape Change for the Area of Ellingerode (Hessen, Germany)

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Introduction

In the academic year of 1999/2000, a student project at the University of Kassel started to work on a prognosis of landscape change for a mid mountain range area of Hessen (Germany). The project, named "Change of Landscape in the Area of Ellingerode", was based at first on the question: "How does the landscape change if the AGENDA 2000 (the present agricultural policy of the European Union) takes effect?". The students soon realized that to give an answer on this question, basic inquiry on the key factors that govern the changes of landscape are needed. So actually the primary question was "How does landscape change?"

The next step was to find an example for the exercise. A project area was to be in a mid mountain range, because effects of Agenda 2000 may be stronger in a region that is a disadvantaged zone. The pattern of land use needed to be typical for mid mountain range. The project area should also be near Kassel to be reached easily by the students. The landscape of Ellingerode fulfilled these requirements.

The Ellingerode landscape

The landscape of Ellingerode, a village of 320 inhabitants, was carved out the North Hessian Forest in the Middle Ages. To this day it is traditionally zoned. A cluster of houses, hugged by gardens and orchards, is centrally placed in the best fields of the ancient clearance. Hilltops, some ornate with groups of trees, and grassy slopes lead up to the forest edge. Where southern exposure offer sufficient warmth, orchards were planted, mostly cherry, during the last century. Profits from cattle and fruit production declined, and large tracts of meadow and orchards have been taken out of production. They are subject of agri-environmental schemes, or simply left to natural succession. Former common land has been turned into forest. All

told, Ellingerode is a typical example for villages located in German mountainlands, a picture - postcard village in the romantic sense and at the same time, according to European development policy, a heavily subsidised rural settlement of the disadvantaged zone.

Back to the project

To identify key factors that govern landscape dynamics, the students constructed a theoretical landscape model. The idea was to create a simplified model of the landscape, to manipulate this model by making different assumptions about individual model components, and to learn how important these components would be. Because a model would be able to simplify the reality and at the same time to describe complex relationships of the system (DABBERT 1999). Based on standard methods of Landscape Ecology (LESER 1997), the first simplified model of the landscape of Ellingerode included components such as soil properties and vegetation.

Workshop

The more questions the students asked, the less they were satisfied with the answers their first model could give them. There was too little information, and many more components needed to be included than considered at the beginning (DIEBEL-GERIES et al. 1999). A workshop with representatives from Ellingerode was held in order to learn which decisions are made locally and individually.

To promote the discussion at the workshop fictitious computer manipulated images were used. To complete missing links of the model the village farmers agreed to meet separately with the student group for in-depth interviews. These interviews gave the needed information about individual decisions of farm families within the boundaries of economic development.

Improved Model

After the workshop and interviews the first simplified model was improved to fit the special situation of the landscape of Ellingerode (see Figure 1). This model itself, the key factors and the interdependencies between were described in detail. It became

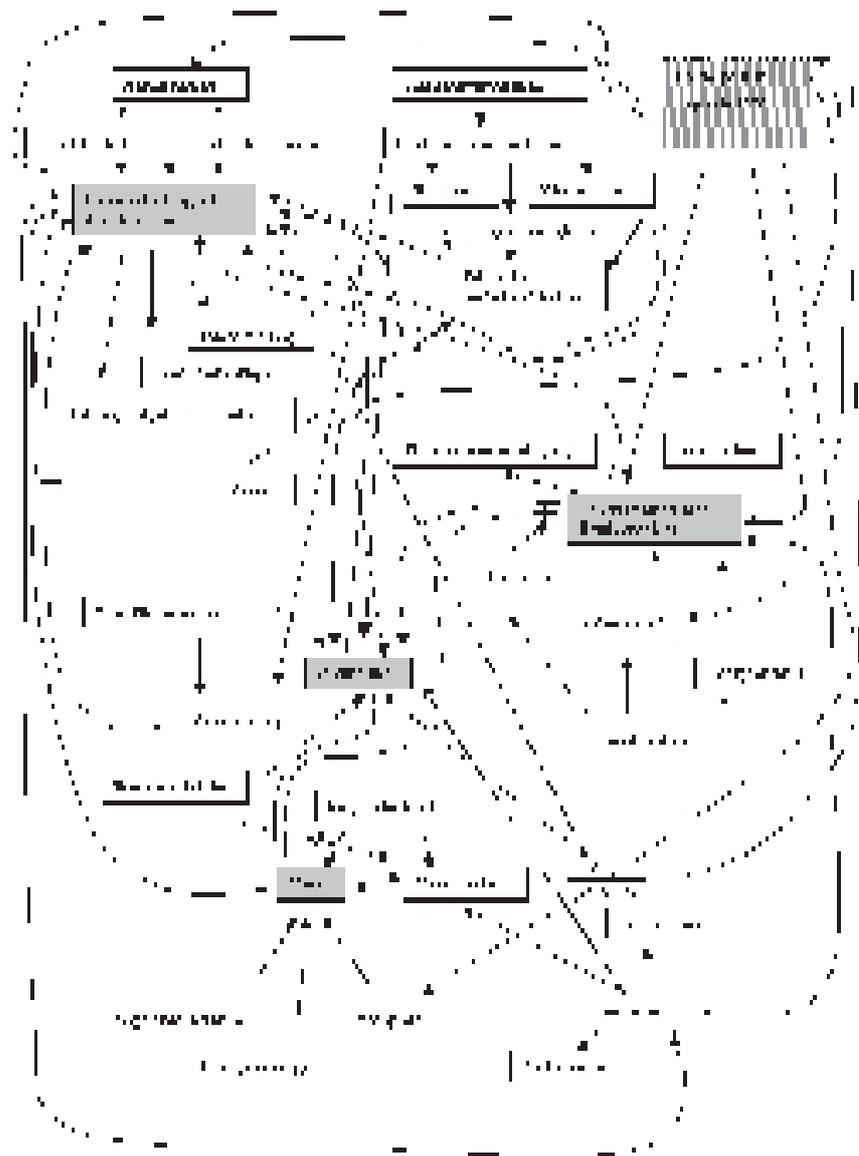


Fig 1: Improved concept of the Ellingrode landscape

apparent that two types of decisions would be significant for the landscape future. Most important is the decision of the next generation whether to take over the farm business or not. Many families don't see an economical perspective in taking over the business. By this fact fewer and fewer farms will remain active.

Of secondary importance is the present European agricultural policy and its future adjustment of prices, politics and financial support for farming.

The farmers in Ellingerode are forced to "grow or give up". In the past decades the number of farmsteads declined from 30 to 17 in 1993 (GfL 1993). In 2000 the number was down at 10, only two of these operated as full time, one as part time farm. The other seven maintain less than 10 ha each and have turned into hobby farms, some run by pensioners. Resulting from political decisions of the 1980ies, the trend of farm consolidation will continue in the decades to come.

Individual decisions to continue working at the family farm may be considered the first level in a hierarchy of decision making, the adjustments made by agricultural policy the second level. There are very many options that may follow on the third, the fourth and the following levels of this hierarchy. These options are hard to predict because of a low probability.

E.g. if there is the interest to establish an initiative for reusing and maintaining the old orchards there will certainly be an effect on the landscape. A next option could be whether the orchard is managed in organic or in conventional manner.

Thus the students built a decision tree (see figure 2) which helps to explain possible changes of the landscape.

Scenarios

From the spectrum of potential landscape three scenarios were discussed and analysed with the help of the improved model of

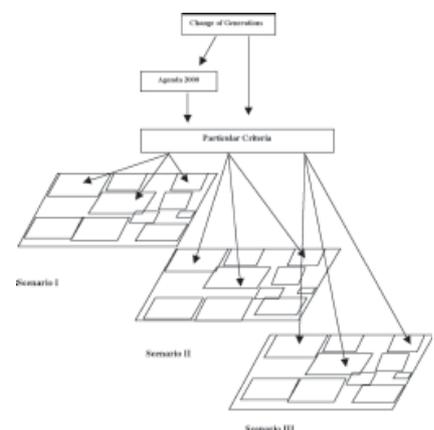


Fig 2: Decision tree for scenario assembling

Ellingerode and the decision tree:

- "Vision of segregated landscape of Ellingerode" as an economically orientated scenario, that minimizes conflicts in landuse by segregating different kinds of landuse
- "Vision of integrated landscape of Ellingerode" as an ecologically orientated scenario. Aims at a maximum of synergetic effects between the landuse, to make it possible that more than one landuse can overlap. A long term thinking for a sustainabel use of resources is the core of the scenario.
- Scenario "Vision of a projection of status quo" as a scenario that continues the current policies. The introduction of the Agenda 2000 policy does not take place.

The students elaborated descriptions of the changes of landscape of Ellingerode by:

- Detailed descriptions for each scenario,
- Geographical Information System (GIS) generated maps on specific topics and analysis on the change of landscape and
- Artificially rendered images of the future landscape of Ellingerode for the three scenarios.

Geographical Information System

Fig 3: Status quo image of scenario I

Of importance for the project was a GIS analysis of potentially fallow



land. It was based on information farmers gave for taking over land from farms that have given up. The main criteria for this are the fertility of soil, the size of fields and the suitability as arable land.

In all likelihood approximately 30 % of the current farmland will be taken out of production within the next 20-30 years. Depending on which of the scenarios is closest to reality the figure will be slightly higher or lower. The potential fallow mostly cover the orchards and the meadows on slopes.

Presentation of the results in Ellingerode

At the next meeting in Ellingerode the results were presented to locals. Artificially rendered images (see figure 3) of possible landscape futures were presented. These images proved to be of great effect. For most of the 20 villagers, some of whom had attended the first workshop, the images conveyed potential landscape change much better than maps and written explanation ever could. People admitted that while they were rationally aware of landscape altering over time, they were not taking note of the gradual changes. When confronted with images that clearly and realistically show the effects of what they themselves had previously suggested might occur, the attendants were noticeably impressed. A lively discussion on the suddenly visualised changes ensued, culminating in one question: "Which are the changes we are prepared to accept in our home

Fig 4: Manipulated image of scenario I



lands?”. There was an overall consensus that what is needed is a third image, a scenario which would serve as a kind of guideline for achieving the desirable landscape of Ellingerode.

Conclusion

For the students the project was a success in several ways.

A basic result was that the Agenda 2000, formerly thought as the main factor of changes of the landscape, does not play the leading part in the model. Of importance for the change of landscape is whether the next generation is taking over the business or not and this decision is not depending on the Agenda 2000, but the former policy.

The students learned by what factors the landscape is governed and how complex the structure is. It became clear that future planning needs to be orientated on the individual situation of the area and the people to achieve a maximum effect. A participation process was useful for the project because individual information of the people and especially the farmers in Ellingerode opened the possibility to predict the changes of the landscape more detailed and realistically.

People are often overwhelmed by planning results. Text reports and maps are not conveying the content and the consequences for the people to understand well. The link to translate the planning into a mind picture is missing for the most people that are not usually dealing with planning. The artificially rendered images could close this gap with little effort. Images are rendered quickly and the needed software is effortable.

A serious requirement of manipulation techniques for people to trust the planner is an honest application. Considering the effects of artificially rendered images in the decision process, especially in participatory projects, the adequate use might be a step forward to increase acceptance by the people and to decrease deficits in future planning.

References:

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