Futures 69 (2015) 1–13

Contents lists available at ScienceDirect

Futures

journal homepage: www.elsevier.com/locate/futures

Landscape scenarios: A study of influences on attitudes and actions in a rural landscape

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ARTICLE INFO

Article history:
Available online 11 March 2015

Keywords:
Landscape scenarios
Markov chain model
Cognitive aspects of scenario use
Attitude change
Rural landscape change

ABSTRACT

Landscape scenarios are a well-recognized and often applied tool in landscape and spatial planning. Their frequent use raises the question of how the use of the scenario influences the attitudes and actions of the individual stakeholders in the landscape.

The study was performed in the area of two rural communities in western Slovenia and focused on two groups of stakeholders, farmers and decision-makers, because these groups have the ability to directly or indirectly impose landscape changes. The farmers were separated into a test and control group and participated in an experiment that included a scenario experience different for the test and control group and ended with a survey interview. Decision-makers participated in a two-round Delphi study, which also involved a scenario exercise.

Overall, the results confirmed that landscape scenarios influence attitudes associated with the landscape. The impact on actions was only partially confirmed, as many external factors that might also influence future actions could not be excluded, such as personal characteristics, professional occupation or the characteristics of the farm. The study provides implications for further research, such as the magnitude of scenario impact and the interaction of scenario use with other factors which might affect the formation of and changes in attitudes and actions associated with landscape.

1. Introduction

Landscape changes are an integral characteristic of landscapes. In the rural landscapes in alpine and pre-alpine areas of Europe, the main drivers of landscape change are related to significant natural factors and topographical constraints as well as specific economic, socio-demographic and environmental factors, resulting in a variety of landscapes, species and cultures (Tappeiner, Borsdorf, and Tasser, 2008). Despite the knowledge on the current state of the landscapes and driving forces, future landscape change is rather uncertain and thus unpredictable, as illustrated by Palang, Alumäe, and Mander (2000). To aid future-oriented thinking, scenarios have become a regularly applied tool in the field of spatial and landscape planning.

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http://dx.doi.org/10.1016/j.futures.2015.02.002
0016-3287/

The noticeable increase of scenario-based studies in the field of landscape and spatial planning and of their use to promote public participation led to the research question: *Could the attitudes and related actions of the individuals regarding landscape changes be influenced by the use of scenarios?* The goal of the research was to assess the role of scenarios in fostering changes in attitudes and consequently the favourable behaviour in the landscape. The novelty of the research is the assumption that scenario use could have diverse impacts on stakeholders' attitudes and behaviours related to the landscape, the method of scenario development using Markov chains, and particularly the survey including the test and control group experiment which allows conclusions on causality, and was further supported by qualitative knowledge provided by Delphi study.

Scenario-based studies began in the middle of the 20th century as an approach to decision-making, and their application in spatial planning began to increase in the early 1970s (Shearer, 2005). In landscape planning, the term *scenario* refers to various probable accounts or alternative assumptions that represent future landscapes. According to Steinitz et al. (2003), landscape changes are usually directly related to changes in land use and pattern of land cover. The broad use of scenarios has resulted in a number of various definitions. Among those that explicitly refer to stakeholders, the definition presented by Shoemaker (1993) explains the role of scenarios in the planning process as "stimulating creative ways of thinking that help stakeholders break out of established patterns of assessing situations and planning actions, so that they can better adapt to the future". Here we also expose the ability of scenarios to facilitate the exchange of information and improve cooperation between researchers, planners, stakeholders and the general public in the search of optimal solutions.

Scenario use in landscape and spatial planning has been presented in numerous research papers that focus on various aspects of the practice, including its contribution to participative planning procedure and its effect on participants. Tress and Tress (2003) wrote about stakeholders' reactions to scenarios presenting unanticipated landscape changes, reporting that the participants expressed fears of scenario realisation and disbelief that such scenarios were only a part of a research study. Regarding the role of scenarios in public participation process, Wollenberg, Edmunds, and Buck (2000b) emphasised the use of scenarios to enhance communication and decision-making and Šantručkova, Weber, Lipsky, and Stroblova (2013) involved local stakeholders to select the optimal alternative as basis for strategic landscape development. Sheppard (2005) discussed the idea that landscape visualisations illustrating potential futures may motivate public awareness and behavioural change regarding climate change mitigation, likewise Kasemir et al. (2003) focused on climate-change issues and noted citizens' perceptions. Lately there has been an increased focus on application of scenarios in landscape preferences studies, e.g., Larcher, Novelli, Gullino, and Devecchi (2013), Soliva, Bolliger, and Hunziker (2010) and Lewis (2008). Although several observations indicate the impact of scenario use on stakeholders' attitudes and actions as a positive outcome, there is a lack of empirical and scientifically sound evidence to support this conclusion. The psychological literature on the cognitive effects of scenario use reveals a different approach to the subject. Gregory and Duran (2001) summarised the results of several research projects designed to determine the impact of scenarios. It should be noted that their research did not specifically apply to landscape scenarios. The study confirmed that scenarios can enhance expectations that the depicted event will occur, provoking certain behaviours oriented towards realising or preventing the scenario events.

2. Methods

The design of the experiment was based on a model showing the process of changing attitudes and actions (see Fig. 1) as spurred by scenario. The general methodological approach followed experiments presented by Gregory and Duran (2001), using control group experiments to assess the variables. Whereas scenario planning concept refers to the theoretical model presented by Chermack (2003, 2004), applying scenarios as input information that stimulates learning through the transformation of mental models closely linked to attitudes was first demonstrated by Doyle and Ford (1998) to lead to improved decisions and actions.

The test area chosen is the most representative of Slovenian rural landscapes in terms of physical characteristics and socio-economic processes. Although this was a difficult choice to make due to the high landscape diversity of Slovenia, we assume that the findings are transferable to similar places in Slovenia as well as to other (mainly Alpine and pre-alpine) regions. The research took place in a test area within two communities in western Slovenia, at the transition between the Mediterranean and Alpine areas, where predominant land uses are forestry and farming. The test area covered a surface of 84.2 km^2 populated with approximately 1200 inhabitants. Although the area is relatively small, its characteristics and driving forces are similar to the rest of the pre-alpine area of Slovenia. Pre-alpine landscapes cover around one-third of Slovenia's surface and are thus the most widespread landscape type. The majority of the land is owned and maintained by farmers, who most directly influence the landscape. Farmers – specifically the owners of family farms – were therefore chosen as the primary target group. The survey addressed the entire population of 160 farm owners in the area, with 135 farm owners responding. To complement the research with qualitative information, a Delphi study involving decision-makers responsible for spatial development and landscape management in the test area was also conducted. Eight public officials from the municipal and national levels responded.

2.1. Scenario development

The diversity of scenario application contexts is reflected in the diversity of scenario typologies, e.g. proactive and preactive or normative and descriptive scenarios (Ackoff, 1981; Schoonenboom, 1995; Shearer, 2005); visions, projections,