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# Evaluation of Geodesign Maps for Spatial Planning

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## Abstract

This study investigated the maps of four geodesign tools to present stakeholder objectives. The tools vary in how objective value information is presented. The tools differ in the number of calculation steps and the complexity of these steps. The more complex tools are less suitable for interactive use, though these tools are suitable to support specific stakeholder tasks.

## 1 Introduction

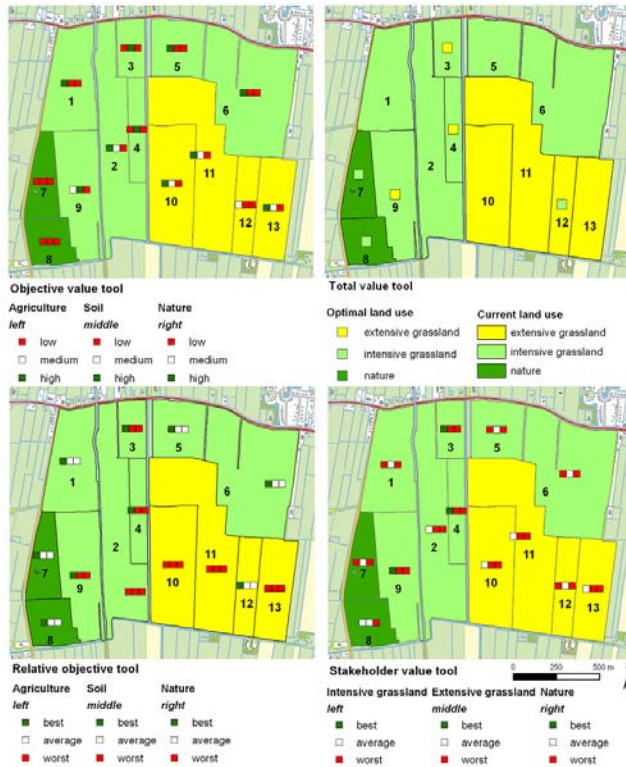
Spatial planning requires a combination of different types of spatial information with stakeholder values. Geodesign tools can be used to support stakeholders to use this information for spatial planning. There is a lack of quantitative testing of the effectiveness of geodesign tools (VONK et al. 2005; GEERTMAN et al. 2013; INMAN et al. 2011; ARCINIEGAS et al. 2012). It is not self-evident that when the information is put in a map, this visualisation is also understood by the viewer (STEINITZ 2012).

The underlying assumption of geodesign tools is that they potentially increase effectiveness of decisions of the planning process. However, effectiveness is a broad concept that can include many aspects. Besides effectiveness, a tool can also contribute to general enlightenment. This study measures the effectiveness of geodesign tools as tool performance. Performance is considered high if the user interprets the information presented correctly.

## 2 Tool Design

Traffic light boxes were used to present information based on objective values (Figure 1). Using the traffic light boxes for presentation four types of geodesign tools were developed.

Each of these tools provide information about the value of three main stakeholder objectives but do this in a different way. The tools vary in how objective value information is used. The tools are applied on a local study area in the Netherlands of 13 parcels of about 4km<sup>2</sup>. Each of these parcels has a specific land use and water level that influences the objective values. The translation of the relation between these physical conditions to values is based on expert judgment. The tools are named the 1) objective value tool, 2) relative objective value tool, 3) stakeholder value tool, and 4) total value tool.



**Fig. 1:** Four geodesign tools: a) objective value tool, b) relative objective value tool, c) stakeholder value tool, d) total value tool

### 3 Method for Tool Evaluation

Different maps based on the four tools were tested in an online survey. Participants were asked how they interpreted the content of each map and they were asked to select those that they found most appropriate for the assignments in the survey.

### 4 Results

The results show that maps presenting individual performances are easier to understand compared to maps based on multiple calculation steps. The inclusion of more levels lowers performance for interactive use. The maps are further found functional in supporting the assignments they were developed for, though the calculation methods behind the tools should not contain too many calculation steps.

## 5 Conclusion and Outlook

The advice for tool design is to limit the number of calculation steps for collaborative use. In any case, explanations are suggested to be included to clarify what can be read from the maps. For interactive use it is recommended to only use maps that present individual objective values. The tools allow stakeholders to experiment with information by trial and error and are expected to be suitable in different stages of the planning process as the impact of changes can be visualised for multiple criteria simultaneously in combination with the underlying physical map.

## References

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