

8 Influence of urban green & water on residential property values

8.1 Overview

Trees, parks, gardens and water increase the amenity of residential areas, which is reflected in property values (Czembrowski & Kronenberg 2016; Franco & MacDonald, 2017). In the Netherlands, multiple studies have been done to quantify the influence of vegetation and water on property values, for example Daams et al. 2016 and for an overview Ruijgrok et al. (2006). This model uses Luttik & Zijlstra (1997) as a main data source.

The studies in the Netherlands make a distinction between two aspects, i.e. the view on green elements, parks and water, and the proximity to these elements. Currently, the increase in property value due to urban green and water in residential areas can be viewed within the Atlas of Natural Capital (see Table 8.1). The output map has been produced by combining existing spatial data for the Netherlands with maps developed by RIVM for the Natural Capital Model. Tables 8.1 and 8.2 provide an overview of the input and output maps used to model the ecosystem service 'influence of urban green and water on residential property values'.

Table 8.1. Output maps generated for the ecosystem service 'influence on residential property values'.

Output map	Unit	Short description
Influence of urban green & water on residential property value	[€]	The part of residential property values that result from surrounding green areas and water

Table 8.2. Input maps applied to estimate the ecosystem service 'influence on residential property values'.

Input	Unit	Short description	Source
Ecosystem unit map	Ecosystem unit classes	Ecosystem unit classes map for the Netherlands in 2013	CBS 2017
Inhabitants	# inhabitants per cell	Shows the number of inhabitants per cell	RIVM (Appendix II)
Property Value	Euro	Average property value per neighbourhood 2015 (Dutch: WOZ)	CBS 2016
Vegetation	% cover per cell	Shows the percentage of a cell that is covered by vegetation (low vegetation, bushes and shrubs and trees combined).	RIVM (Appendix I)
Open Water	land use class	Selection of water classes from LCEU	RIVM

8.2 Modelling the ecosystem service

The influence of urban green and water on residential property values is estimated based on the water classes in the LCEU map and the vegetation map of the Netherlands. Figure 8.1 provides a schematic overview of the way input data has been modelled in order to produce the output maps for this ecosystem service.

8.2.1 *Influence of urban green & water on residential property value*

The influence of urban green and water on residential property value is estimated according to:

$$\text{InfluenceGreenWater} = \text{frIncrease} * \text{PropertyValue}$$

Where:

- *PropertyValue* is the property value (so-called WOZ-value in the Netherlands) available at neighbourhood level for residential areas from the CBS for 2016.
- *frIncrease* is the fraction of increase in property value for four different types: view of a tree line, view of a park or water, proximity to a park or water and open water as given in Table 8.3.

Table 8.3. Fraction of increase in property value given different amenities of urban green and water (Luttik & Zijlstra, 1997 and Ruijgrok, 2006).

Types of urban green and water	Fraction of property value increase
View of a tree line	0.05
View of a park or water	0.08
Proximity to a park or water	0.06
Open water	0.12

Currently, the presence of multiple types of green or water is not accounted for. The highest fraction increase that is available is applied: open water, view on park or water, proximity to park or water respectively.

8.2.2 *Availability of open water*

The availability of open water has been defined on the topographic map that shows water areas (Top10Water). Here Top10Water is used instead of the water classes from the LCEU map because the LCEU map does not distinguish between open water and small water bodies such as ditches, canals and ponds, whereas this is necessary for this model. Open water is available if the water area is larger than one ha and if it is within a 50m distance of a residential area (based on the map showing inhabitants, Appendix II).

8.2.3 *Proximity to a park or water*

The proximity of houses to a park or water has been derived from the vegetation map of the Netherlands that includes trees, bushes, flowers, plants and grass (Appendix I). Parks have been defined as vegetated areas larger than one ha that consist of cells with more than 60%

vegetation cover. The land cover class 'water' is based on the LCEU map and can be as small as one cell of 100m². The proximity to a park or water is defined as the availability (of at least one cell) of park or water within a distance of 400m.

8.2.4 *View of a park or water*

A view of a park or water has been defined in the same way as the proximity to a park or water, with the difference that the park or water should be within a distance of 30m.

8.3 **Remarks and points for improvement**

- The model is currently based on the references used in the TEEB-Stad tool. A recent study conducted by Daams et al. 2016 and an ongoing follow-up project by CBS could provide a more accurate modelling approach.
- In the current version of the spatial model, a view of tree lines is not included, as the available spatial information on tree lines was not sufficient. This aspect is included in the TEEB-Stad tool methodology and could be added in a later version of the spatial model.
- Currently, all water bodies from the LCEU map have been included. Whether very small water bodies truly contribute to property values is questionable.

8.4 **References**

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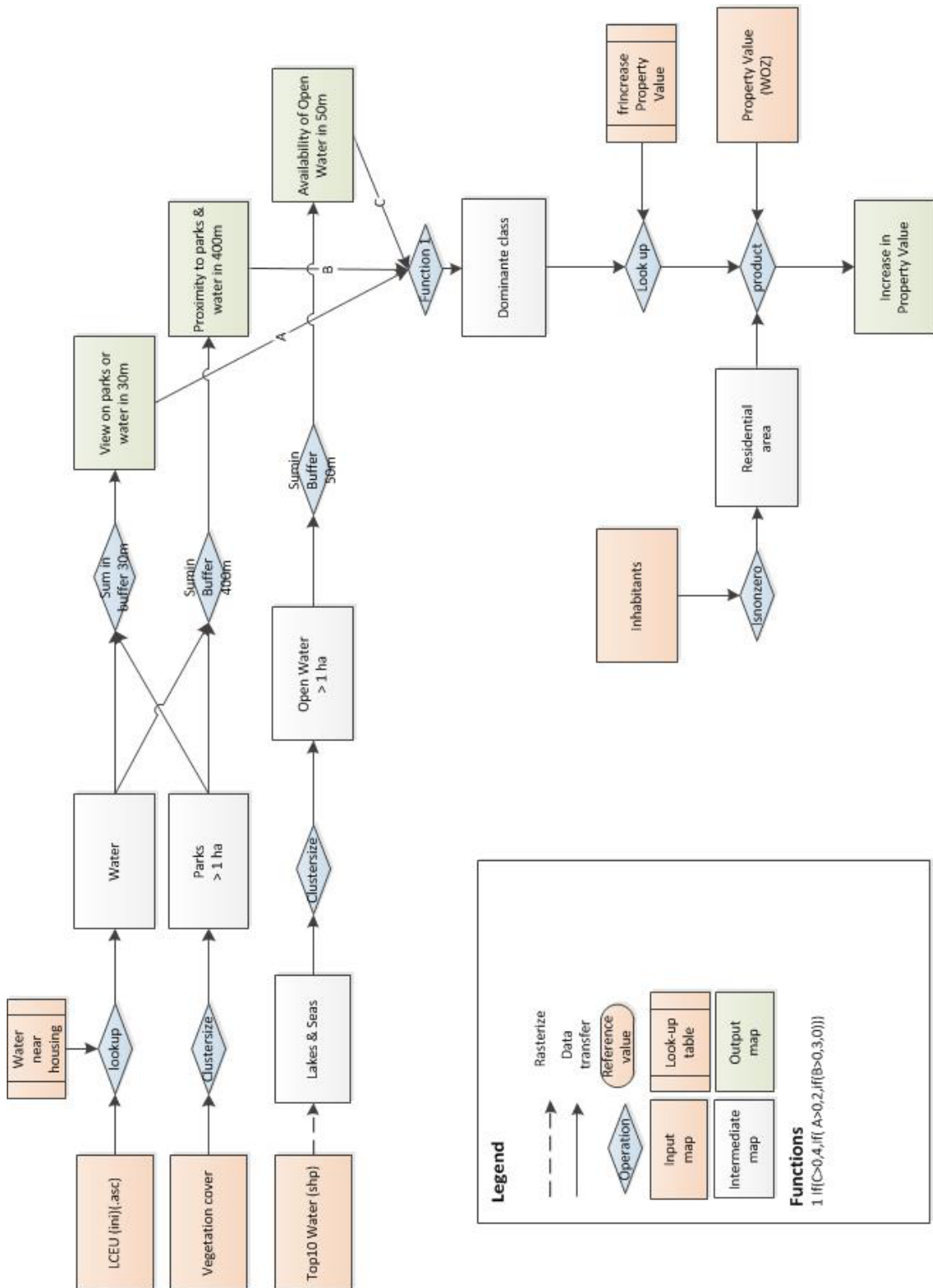


Figure 8.1 Schematic overview of the influence of urban green and water on property value.