

## The Impact of Recreational Shortages on Urban Liveability

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### Abstract

According to the Council for the Rural Area, the Dutch constitution requires the government to offer sufficient opportunities for outdoor recreation that are available, reachable and accessible for everyone. An instrument called AVANAR has been developed to identify whether and where shortages in recreational opportunities for walking and cycling exist. Both indicators suggest that many urban neighbourhoods are dealing with severe shortages. However, these indicators are quite normative in content. For the identified shortages to be taken seriously, especially by representatives of opposing interests, empirical corroboration is highly desirable. This corroboration is sought in the negative consequences that one might expect to occur in case of an insufficient supply, such as less satisfactory recreational experiences. Some first analyses suggest that there is indeed a relation between the normatively defined shortages and at least some of the expected negative consequences of 'real' shortages.

**Keywords:** AVANAR; demand; supply; recreation; green space; liveability

### 1. Introduction

The Dutch constitution requires the government to create conditions for leisure. The Council for the Rural Area interprets this to include offering sufficient opportunities for outdoor recreation that are available, reachable and accessible for everyone (RLG, 2004). But what constitutes an available, reachable and accessible recreation opportunity, and how much of these opportunities are sufficient? Answering these questions helps local authorities to decide whether action is required to increase the number of opportunities, or to safeguard existing opportunities against strong pressures to convert urban green areas into dwellings, parking lots etc. The Council feels that the quality of the supply is important too, however, in this paper we will focus on the quantitative aspect.

An instrument has been developed and applied to identify where shortages of recreational opportunities exist and how large these shortages are. It has been named AVANAR, the Dutch acronym for the Co-ordination of the Demand for and Supply of Nature As Recreational Space. An early, still relatively crude, version of the instrument has been applied nationally by commission of the Netherlands Environmental Assessment Agency (De Vries & Goossen, 2002). The present, more refined version of the AVANAR-instrument has been applied to the three largest cities within the Netherlands: Amsterdam, Rotterdam and The Hague (De Vries et al 2004a; De Vries et al 2004b). The analyses suggest that quite a number of urban neighbourhoods, especially in the larger cities, are dealing with severe shortages. However, the indicators are quite normative in content. For example, reachability is incorporated by requiring opportunities to be located within a certain distance of the residential neighbourhood. What this distance should be is open to debate. For such shortages to be taken seriously, especially by representatives of opposing interests, empirical corroboration is highly desirable.

## **2. The AVANAR-Instrument in More Detail**

The AVANAR-instrument is quite generic, but in this paper we will limit ourselves to the two most popular recreational activities in the Netherlands; walking and cycling. Although these activities sometimes take place in a built-up environment, green surroundings are generally preferred. Moreover, since such opportunities are considered a basic amenity, the demand should be accommodated already at the local level. This required the instrument to be spatially explicit. The instrument was designed to be highly operational and nationally applicable; applying the instrument should not cost much effort, time or money. Therefore it makes use of already existing national databases for the demand for, as well as the supply of, recreational opportunities. Since the instrument itself is not the focal issue in this paper, it will only be described here briefly. For an extensive description of the method the reader is referred to De Vries and Bulens (2001; first version) and De Vries et al (2004a; latest version). Since we will be using the outcomes of the national analysis performed with the crude version of the instrument, we will focus on this first version.

### *2.1 Supply*

The supply of recreation opportunities is determined mainly by means of the national land-use database of Statistics Netherlands (CBS). Each category of land use has been assigned a capacity for each recreation activity, often zero; only green types of land use that are a) open to the public, and b) not dominated by man-made attractions, were given a positive capacity. Two factors determine the size of the capacity for walking and cycling. The first is the density of the recreational infrastructure for the activity at hand; paths and quiet country roads – the higher the density, the higher the capacity. The second factor is the openness of the landscape – the more open, the lower the capacity. The capacity is expressed as the number of people that can perform the recreational activity on one hectare of the type of land per day. Forests have been assigned a capacity of 9 for walking and 3 for cycling. Open agricultural land with low infrastructural density has been assigned the lowest, still positive capacity: 0 for walking and 0.2 for cycling.

### *2.2 Demand*

The size of the demand is assessed by means of the neighbourhood register of the CBS. The whole of the Netherlands is subdivided into over 10,000 neighbourhoods. Of each of these neighbourhoods the number of inhabitants is known, as well as some other aspects of their population, eg the percentage that belongs to an ethnic minority. These numbers are transformed into demand figures by using the national percentage of the population that participates in the recreation activity on the norm day. The norm day is the day of the year on which there should be enough capacity available to accommodate the local demand. We used the fifth busiest day in our analyses. In contrast to the latest version, in the first version of the instrument no distinction was made in the participation percentage between the demands of different population segments. An estimated percentage of 10.4 was used for walking and of 6.7 for bicycling.

### *2.3 Confrontation*

To confront demand and supply, a circle is drawn around the centre of each neighbourhood. The size of the circle is determined by the norm distance that is chosen. This is the distance within which enough supply should be available for the local population. In the national application of the first version of the model this distance was set at five kilometres, for walking as well as for cycling. The instrument takes into account that the circles for the different neighbourhoods will frequently overlap so the outcome is the supply that is uniquely available for a given neighbourhood. This amount is expressed as a percentage of the total

amount of recreational opportunities that is required to satisfy the demand of the neighbourhood population. The outcome of the analysis may also be used to calculate spatial claims; the additional natural area that is needed to solve existing shortages.

### 3. Shortages and Their Consequences: Some First Secondary Analyses

Normatively defined shortages cannot be observed in the field. However, shortages are assumed to require action because they have negative impacts. It is along this line that the social relevance of the calculated shortages may be verified empirically. Possible negative consequences of recreational shortages include less satisfactory recreational experiences, lower participation in recreational activities and increased leisure mobility, especially by car. As a result of such primary consequences, secondary negative consequences may emerge. Eventually, this may result in an increased tendency to relocate among those that can afford to do so, leaving a poorer segment of the population behind. This remaining population may even suffer health consequences due to increased levels of stress and decreased levels of physical activity, social cohesion and social safety. By reviewing studies on such issues and, whenever possible, secondary data analysis, an attempt was made to assess to what extent relations between normatively defined recreational shortages and their possible negative consequences really do exist. Some highlights of this study are described below. A full account can be found in De Vries and others (2004a). Using the outcomes of the national analysis, for each neighbourhood in the Netherlands the percentage of the local demand that is met by the local supply is known, for walking as well as cycling. To be able to identify nonlinear relations the two indicators are reclassified into five levels of available supply each. It may be noted that for walking, 67 per cent of all neighbourhoods fall into the highest availability class (80-100 per cent). For cycling this is even higher at 83 per cent, so most Dutch neighbourhoods do not suffer from a lack of recreational opportunities for these two activities.

#### 3.1 Experiencing quietness and space

De Vries and Van Kralingen (2002) conducted a nationwide survey on how the Dutch appreciate the countryside surrounding their place of residence. Besides its overall attractiveness, respondents rated its naturalness, the opportunities it offered for own use (leisure), and to what extent this countryside still offered quietness and space. By means of the four digits of the respondents' postcode area, the survey data were enriched with the two supply indicators. Average ratings, on a 10-point scale, were calculated for the five levels of supply availability over the almost 1,500 areas for which at least one rating was available ( $n = 1482$ ). Table 1 shows positive relationships for all four ratings with the level of supply availability per activity. The relationship is especially clear for the rating on quietness and space; the higher the availability, the more quiet and spacious the own surrounding countryside is perceived to be.

Table 1. Average rating of own countryside on several aspects (scale:1-10) by supply level of the neighbourhood for walking (W) and cycling (C)

Supply level	Attractiveness		Naturalness		Own use options		Quietness & space	
	W	C	W	C	W	C	W	C
0 – 20%	6.9	6.5	6.0	5.0	6.4	6.0	5.2	4.1
20 – 40%	7.2	6.5	6.2	5.9	6.7	6.4	6.2	5.4
40 – 60%	7.5	6.7	6.7	5.9	7.2	6.4	6.7	5.7
60 – 80%	7.6	7.1	6.8	6.2	7.4	7.1	7.3	6.1
80 – 100%	8.1	8.0	7.3	7.2	7.7	7.6	7.5	7.4

Note: all ratings differ significantly between supply levels at the 0.001-level for both activities.

### 3.2 Action radius for recreational walks

Reneman and others (1999) conducted a nationwide survey on the desires of the Dutch regarding nature and green areas within their living environment. One of the questions concerned the distance people had to travel to walk for leisure in green surroundings. Based on the six-digit postcode of the respondent, the survey database was enriched with the two supply indicators. Subsequently, the average distances for all supply classes were calculated ( $n = 2480$ ). Table 2 shows that there is a relationship between the supply level and this average distance. People with a low level of supply indicate they have to travel further. For the supply of walking opportunities the relation is not completely monotonous, whereas for cycling it is. A possible explanation is that in highly urban neighbourhoods with a low supply, people do not have to travel very far to reach an urban park in which they may take a walk. The fact that this park may be rather crowded is not expressed in the distance figures.

Table 2. Average travel distance for walking in a green environment by supply level of the neighbourhood for walking (W) and cycling (C)

Supply level	Average distance (km)	
	W	C
0 – 20%	13.5	18.9
20 – 40%	15.9	16.5
40 – 60%	13.1	12.9
60 – 80%	9.3	12.6
80 – 100%	9.0	10.1

Note: distances differ significantly between supply levels at the 0.001-level for both activities.

### 3.3 Composition of the local population

Using the information on the local population available in the CBS neighbourhood register, we looked at the relationship between the presence of ethnic minorities and the supply of recreational opportunities. This analysis used the neighbourhood as a unit of observation. Because ethnic minorities tend to live concentrated in the larger cities, the analyses focused on the two highest of the five levels of urbanity that Statistics Netherlands distinguishes. Table 3 clearly shows that local populations with a substantial percentage of ethnic minorities are more common in neighbourhoods with a low level for walking opportunities. This relationship is especially strong within the subset of very strongly urban neighbourhoods.

Table 3. Percentage of neighbourhoods with at least 10% of the population belonging to an ethnic minority by supply level for walking (strongly and very strongly urban neighbourhoods only)

Supply level for walking	Strongly and very strongly urban neighbourhoods ( $n = 1762$ )	Very strongly urban neighbourhoods only ( $n = 683$ )
0 – 20%	46	60
20 – 40%	28	36
40 – 60%	19	20
60 – 80%	16	35
80 – 100%	20	18

#### 4. Key Concluding Points

- Despite its normative input, shortages in the supply of recreational opportunities as calculated by the AVANAR-instrument were shown to be related to several negative consequences, including the quality of recreational experiences, recreational mobility and composition of the local population.
- It is not yet clear to what extent the recreational shortages are instrumental with regard to these consequences; it has not been proven that the above relationships are causal in nature. More research is clearly needed to resolve this issue.
- The AVANAR-instrument seems to be a promising tool to aid policymaking and spatial planning for outdoor recreation in a natural environment.
- Based on the present results, its function may go beyond the benchmark function it already has – comparing different residential areas with regard to their recreational supply and demand ratio.
- In the future, it may be possible to corroborate the spatial claims based on AVANAR-analyses by showing the negative consequences that are a consequence of existing shortages, based on empirical research.
- Even if negative consequences can be attributed unequivocally to the (calculated) shortages in green recreational opportunities, it remains a political choice to decide what consequences are still acceptable and what are not.
- A good knowledge of the negative consequences associated with a given level of supply is likely to make choices regarding such levels more informed and easier to defend within the political arena.

#### References

- De Vries, S. & Bulens, J. (2001). *Explicitering 300.000 ha, fasen 1 en 2* [Making the 300,000 hectare claim explicit, fases 1 and 2]. Wageningen: Alterra.
- De Vries, S. & Goossen, M. (2002). Predicting transgressions of the social capacity of natural areas, in Arnberger, A., Brandenburg, C. & Muhar, A. (Eds.) *Proceedings of the Conference on the Monitoring and Management of Visitor Flows in Recreational and Protected Areas*. Vienna, Jan 30-Feb 2, 2002.
- De Vries, S. and Van Kralingen, R. (2002). *De beleving van het Nederlandse landschap door haar bewoners* [The experience of the Dutch landscape by its inhabitants]. Alterra-rapport 609. Wageningen: Alterra.
- De Vries, S., Hoogerwerf, M. & De Regt, W. (2004a). *Analyses ten behoeve van een Groene Recreatiebalans voor Amsterdam* [Analyses for a Green Recreation Audit for Amsterdam]. Alterra-rapport 988. Wageningen: Alterra.
- De Vries, S. & De Regt, W. (2004b). *Het recreatieve belang van regioparken voor de toekomst; confrontatie van de vraag naar en het aanbod van recreatiemogelijkheden voor de regio's Rotterdam en Haaglanden* [The recreational importance of regional parks for the future; confrontation of supply and demand for the regions Haaglanden and Rotterdam]. Alterra-rapport 958. Wageningen: Alterra.
- Reneman, D., Visser, M., Edelmann, E. & Mors, B. (1999). *Mensenwensen: de wensen van Nederlanders ten aanzien van natuur en groen in de leefomgeving* [People's desires: the desires of the Dutch regarding nature and green space in the living environment]. Reeks Operatie Boomhut nr. 6. Hilversum/Wageningen: Intomart/Staring Centre.
- RLG (2004). *Ontspannen in het groen* [Relaxing in a green environment]. Council for the Rural Area (RLG), The Hague.