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Publication date
2015

[Link to publication](#)

Citation for published version (APA):

Wolsink, M. (2015). *'Sustainable City' requires 'recognition' – The example of environmental education under pressure from the Compact City*. 1. Paper presented at Urban Green Space, Montpellier, France.

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**'Sustainable City' requires 'recognition' –
The example of environmental education under pressure from the Compact City**

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1 Introduction

The concept of sustainable cities has been debated for more than two decades now. Construction of compact settlements (Jabareen, 2004) – as a tool for limiting energy use in transportation and urban sprawl – is seen as a key element in the sustainable city debate (Jenks et al., 1996). The 'compact city' (CC) is characterized by mixed land use and close colocation of buildings, roads, and other infrastructure. The CC is seen as offering economic and social advantages that support sustainability (Burton, 2000); however, the sustainable character of the CC is also challenged (Neuman, 2005), for example because CC policies leave limited space for greenery. This last aspect is quite problematic for the sustainable character of the city, and this article will show how the sustainability claim is challenged by citizens that also perceive lack of recognition for their stakes and arguments they raise in disputes over densification projects.

Access to green public spaces is important for liveability (Howley et al., 2009), as it safeguards respiratory health and general well-being (Irvine et al., 2013). As with regards the overall question of equity and justice in the CC (Burton, 2000), the issue of citizens maintaining green spaces also may become one of justice. Although there is tension between environmental justice and sustainability, these concepts are strongly related and must be jointly addressed in urban planning (Agyeman, 2013). 'Environmental justice' is a compelling discourse on sustainability in cities, and the quality of public spaces is described as a key element in the concept of 'just sustainabilities' in cities (Agyeman et al., 2002). Within the concept of environmental justice, Schlosberg (2004) distinguished three main elements, distributive justice, justice in the process (procedural justice), and justice as recognition. Access to green spaces primarily concerns the distributive justice of allocation, i.e. the location of parks and who can access them (Wolch et al., 2005). However, the pressure on green

(*) Conference paper (currently under review for publication)

spaces created by CC policies is felt by all urban residents, and densification projects regularly turn into environmental conflicts (Ruming, 2014). The perceived fairness of decision-making in such conflicts is an essential element of environmental justice, which is about fairness of process and recognition (Schlosberg, 2004) of interests and stakes of affected citizens.

Decisions to establish CC policies, including the abandonment of green spaces, are legitimized with environmental arguments ('sustainability'). Policies legitimized by these kinds of arguments, tend to downplay counterarguments that also have environmental background. In densification projects there is little recognition of the citizens' and their organizations' stake in maintaining green spaces. There are similarities to conflicts about energy, waste and water infrastructure projects, about which policy makers often claim – with legitimate or less legitimate arguments – that they are inspired by environmental concerns. When faced with residential opposition, policymakers presume that there is a 'gap' between environmental attitudes held by citizens and lack of support to developments which are legitimized to a significant extent with environmental arguments (Bell et al., 2013; Wolsink, 2010; Davies, 2008).

2. Key issue: recognition

In addition to the allocation of green space, the issue of justice concerns the fairness of the process in decision-making about the establishment, location and maintenance of parks. In this process two essential dimensions of environmental justice come to the fore – recognition and participation (Schlosberg, 2004). The key assertion of this article is that in urban densification projects the recognition of the citizen's valuable contributions are often largely ignored, and the validity of their new (or sometimes previously un-noticed, or deliberately ignored) arguments remains unexamined or underestimated.

Some important but uncommon factors may come to the fore in urban densification disputes. Studies in environmental conflicts usually reveal how important it is that the framework of decision-making supports open decision-making processes, favoring mutual learning among the actors (Sairinen et al., 2010). Learning is, for example, the recognition of previously unnoted aspects and arguments. The issue to be examined in this study is the valuation of green space by citizens, which is considered crucial for environmentally 'just sustainability'. The central proposition – about the ignorance of recognition of the citizen's valuable contributions in densification projects – is illustrated with a case study concerning one specific – largely ignored – citizens' argument about environmental education as a significant element of long term urban sustainability. Then an elaboration of this argument follows in a case study of densification in practice in the city of Amsterdam (The Netherlands) and a geographical study providing clear, empirical evidence supporting the validity of the environmental education argument as put forward by the residents in the case study.

3. A new argument in densification conflicts

This study will demonstrate that environmental education is heavily depending upon the proximity of public green spaces to schools. This relation between benefits of parks and distance, and consequently the impact of urban densification, may seem rather obvious (Salazar and Menéndez, 2007), but so far the use of parks for developing sustainability values has been neglected in literature. A recent overview on research questions regarding ecosystem services of green spaces in urban environments, Niemelä (2014, p.300) does mention ‘educational possibilities’ as a cultural ecosystem service, next to opportunities for recreation and recuperation from stress, but the issue is not elaborated further, and there is no reference to existing research.

Also prominent in the environmental conflicts on eliminating green space is the pejorative dismissal of local residents’ objections as only selfish protection of their property values (Wolsink, 2012; Ruming, 2014). In cases of green spaces this is largely unjustified, as in the literature we find recognition of the value of parks for health, respiration, physical exercise, biodiversity, and especially for children (Loukaitou-Sideris, 2003). The of green space for children is an important dimension of equity and justice issues related to parks (Moore, 1997). How can children and youth get reasonable access to parks and open spaces? (Wolch et al., 2005). In this article this question is associated – based on arguments used by residents in densification conflicts – with the options that schools have to use green space for education.

Environmental education should be seen as an important factor for long-term sustainability (Bentsen et al., 2013), but the educational relevance of proximity of schools to green spaces has remarkably not yet been investigated. Hence, this study seeks to highlight the value of green space for urban ‘just sustainability’ by, first, providing examples of contested densification projects in Amsterdam and, second, conducting an empirical analysis of the negative effect of increased distances to green space on environmental education in the city.

4. Densification in practice

Amsterdam adopted a ‘compact city’ policy in the 1970s, which included densification, the urban development of several green places into housing districts, office parks, and commercial sites. For example, the area shown in figure 1 used to contain four green spaces in the 1980s. All have been redesigned during the last three decades, and all developments followed the logic of densification. The struggles that ensued are a good illustration how urban densification projects are contested:

A. ‘Juliana Park’, a poorly maintained park throughout the 1980s, was transformed into a new urban district in 1991. This densification project included social and middle class rental units, privately owned apartments, and offices.

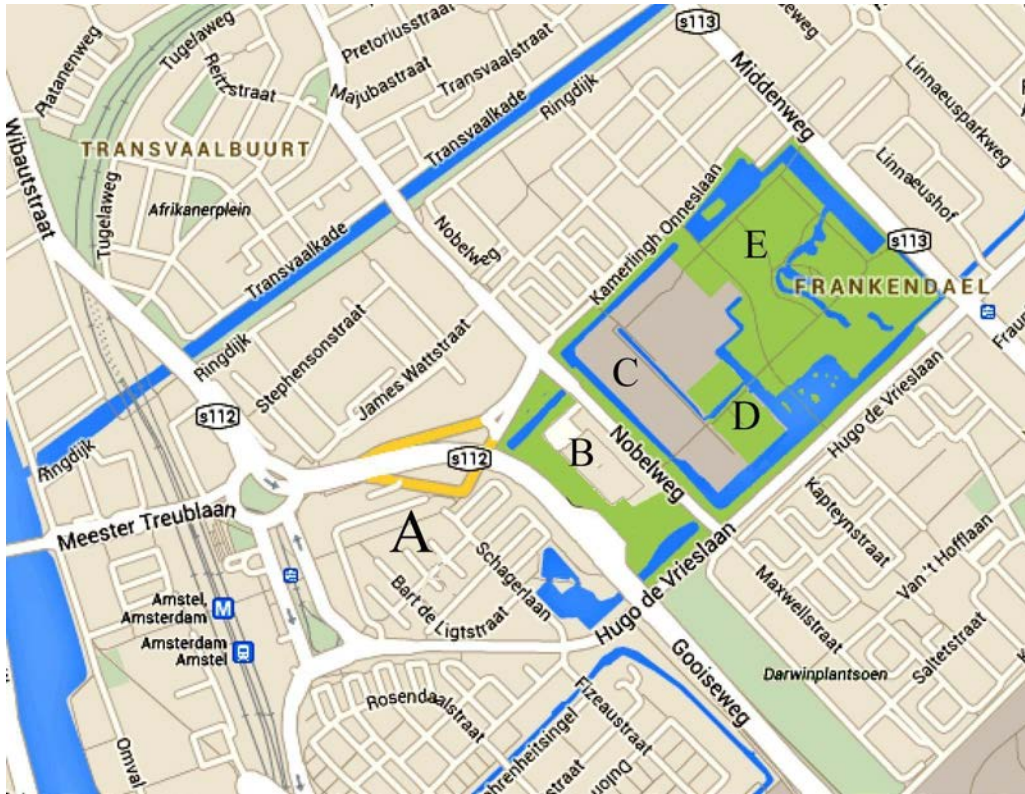


Figure 1. Potential and realized urban densification projects Amsterdam.

- B. Prins Bernhardpark was a green strip including a basketball field between two main roads. In 2000 it was largely developed as a commercial gardening supermarket and a large parking place for their customers.
- C. ‘Klein Dantzig’. The abandonment of this allotment complex was fiercely opposed. Alongside the complex, adjacent to Frankendael there is
- D. A strip of *schooltuinen* (school gardens; H+N+S, 2008, p.44). The civic action sought to defend both the complex and the continuation of the *schooltuinen*.
- E. ‘Frankendael’ was Amsterdam’s former horticulture and tree nursery. This facility was decommissioned in the 1980s and was mentioned in a 1982 report on available sites for potential densification. This suggestion was immediately contested, and strong opposition swiftly followed.

These storylines reveal different resident motives to counterbalance the pressure that urban development puts on green spaces. Spaces (A) and (B) have been two parks and these two green spaces were largely developed, as shown in figure 1. Further densification in this part of Amsterdam – Watergraafsmeer – is envisaged, for example a small green strip that remained as a buffer between (A) and the square before the Amstel metro and railway station is currently involved in a development project with new higher apartment buildings, offices, and hotels.

The area is located in the borough of Watergraafsmeer (A, figure 2) and ongoing densification in this area is not only further decreasing green space surfaces, but it is also putting pressure on water management in this area (Porter et al., 2015). Room for water storage was hardly recognised as an issue in the 1990s, but currently has higher priority in urban planning (Runhaar et al., 2012). In the struggles about the areas in figure 1, the opposition was partly successful. Frankendael (fig.1, E) was redesigned as a park in 1998, and whereas several allotment complexes in Amsterdam were abandoned or relocated to the urban fringe (figure 2), ‘Klein Dantzig’ (fig.1, C) survived. In both cases the importance of these green spaces for environmental education was a key part of the argument. This is a noteworthy argument because it was associated with the development of values of interest to the sustainable city, but this claim remained unrecognized for several reasons, and therefore we will look into it more closely.

Between the allotments and Frankendael there is a *schooltuinen* complex (fig.1, D). In Amsterdam 95% of 10 to 11-year-old pupils of primary schools have their own 15 m² plot for growing crops and educational fieldwork across 13 locations (NME, 2015). Almost every Amsterdam resident has enjoyed positive experiences with these environmental education facilities, either as a child or as a parent. They are so popular that they became in fact a real institution. Hence, the complex and the surrounding green space were defended with the argument – among others – of ‘environmental education’. Moreover, the citizens claimed a much wider significance of green space for environmental education, as they emphasized that these spaces were also important for education of older pupils. In their view, schools needed nearby green spaces, and longer distances resulting from elimination of green space would pose barriers to fieldwork practice in education. In the words of an interviewed resident, active for several years on the residents’ board of the adjacent Frankendael Park,

R2(m) ‘Officials emphasized environmental policy... and said we were narrow-minded, only protecting our backyard. They simply refused to recognize the long-term importance of understanding environmental issues among citizens.... We stressed developing such understanding in secondary schools, but we knew that particularly saving the school gardens was a strong argument. These are very popular among parents ...’

Of course, the arguments of the opposition also focused on the significance of green space for respiratory health and physical exercise, but the argument of the significance of the *schooltuinen* for environmental education could not be easily disregarded in this case. Nevertheless, the authorities immediately challenged the proximity argument; it was not recognized by the planning officers and the opposition was immediately and pejoratively generalized as ‘Nimby’.

As this case illustrates, the significance of environmental education put forward by citizens was denied in the disputes. And indeed, the question arises whether it makes sense or not. Direct contact with environment and nature are considered essential for environmental education (Sandell and Öhmann, 2010). Some researchers find that opportunities for learning beyond the classroom are already in

decline and fairly limited (Mannion et al., 2013). Does a longer distance to urban green space indeed result in significantly lower rates of excursions and fieldwork activities? Whereas physical and psychological health arguments are widely discussed (Tzoulas et al., 2007) the significance of close proximity to greenery for environmental education has not been examined in the literature, so the next section an empirical analysis of the impact of distance is presented.

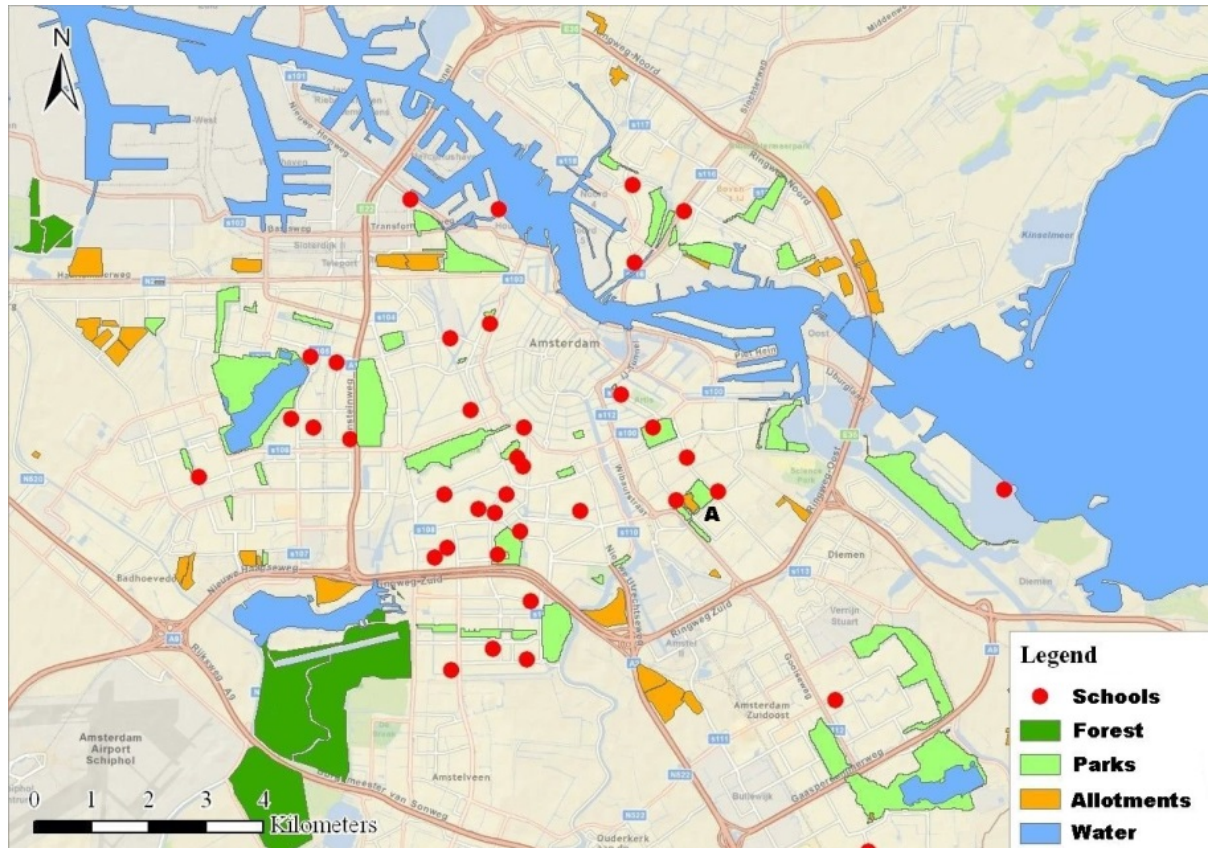


Figure 2. Secondary schools and available public green spaces in Amsterdam

5. Evidence about the citizens' claim

5.1 Method

Residents' claimed that the disappearance of green spaces would further impede the possibilities for outdoor activities in environmental education, which they valued as very important. We carried out a pilot study to check the validity of this argument. Urban citizens' valuation of the diverse benefits of urban parks is clearly correlated with proximity (Salazar and Menéndez, 2007; Schipperijn et al., 2010), so a reasonable expectation is that the educational value of parks is also linked with distance. The question that green spaces should be close to school was addressed by a fairly simple empirical investigation among all secondary schools (N=38) in Amsterdam with a methodology that makes it

easy to replicate in other cities. Our study focuses on publicly accessible green space that can be easily visited by school classes without organising transport.

The hypothesis states a clear relation between two variables: the proximity of schools to green spaces and the number of environmental education fieldwork events that take place. In all the schools, teachers involved in disciplines (biology, geography, chemistry, physics) relevant for environmental education were interviewed their practices with regards outdoor environmental education. The number of fieldwork excursions was established as well as the destination of the trip, dividing between trips to the nearest green space and trips to other destinations. Data were collected for the school year 2010/2011; data for 2012 were added later together with the analysis of in-depth interviews of a sample of the involved teachers. High correlations ($r_{\text{total}} = 0.94$; table 1) between the years indicate strong consistency in the patterns of outdoor educational practices.

With GIS (geographical information systems) the distances from the schools' main entrance to adjacent public available green space, including those with access to water, were calculated ($M=280$ m; $sd=224$ m). All schools and three categories of public green spaces – private gardens without entrance to the public are excluded – are mapped out in figure 2. These proximity data were linked to the data collected at the schools. Furthermore, some statistical background variables were added that could possibly contaminate the relation between distance and frequency of excursions. First, the type of school. In the Netherlands the main categories that are relevant for the curriculum (Dronkers, 1995) are public/neutral (0) versus religious (1; catholic/protestant/ Jewish/Islamic). Second, the tendency to protect property values – which is a key element in the pejorative Nimby argument – is primarily associated with relative affluence of the neighbourhood's residents (Crawford et al., 2008). In conflicts about urban development opposition is seen as 'protecting their turf', i.e. protecting their affluence (Taylor, 2013; Dear, 1992). Although the validity of these assumptions in cases of environmentally relevant infrastructure as well as housing is widely criticized (Petrova, 2013; Scally and Koenig, 2012) a variable to control the relation between available green space and wealth of the school's neighbourhood was introduced to neutralize the possibility that an established relation would be an artefact of neighbourhood affluence. For this purpose the variable average income available in the neighbourhood of the location of the school was added.

5.2 Results

At first glance, the hypothesis that school proximity to green spaces determines outdoor environmental education seems obvious, but the results also show a few surprising observations. The correlations with the 2-years average of educational trips (table 1) clearly support the hypothesis. Moreover, it is not a linear relation, as only close proximity strongly seems to foster environmental education. This effect is remarkably strong, as the a much stronger fit to the logarithmic transformation of distance shows (table 1). The final test of this hypothesis shows a strong amplification of the significance of

Table 1. Association educational trips secondary schools (n=38) with distance.

N of trips	Mean	Internal 2011/12 correlation (r)	Correlation (r) with distance	Correlation (r) with ln[distance]
Total annual	2.58	.94 **	-.43 **	-.54 **
to nearby green space	1.11	.83 **	-.38 *	-.48 **
to other destinations	1.46	.76 **	-.34 *	-.42 **

* p < .05

** p < .01

distance to green spaces for environmental education trips in a regression model including the independent variables of religious foundation and neighbourhood wealth. In line with the criticisms of the Nimby-argument, neighbourhood wealth seems fully irrelevant ($t=.73$; $p>.10$), in fact distances between schools and green spaces were even a little larger in more affluent neighbourhoods. However, not unexpected for the Dutch practice, the religious foundation showed a moderate negative impact on the number of excursions ($t= -1.76$; $p<.10$).

$$N_{\text{educ trips}} = 8.3 - 1.03 * \ln[\text{distance}] - 1.21 * [\text{relig}_{(0,1)}] \quad R^2 = .351$$

The curve implies that the number of trips tends to decrease rapidly with increasing distance. From about 8 per year it rapidly drops and distances over 800 metres already seem too long to facilitate educational trips. Shorter distances offer better opportunities for small excursions to green spaces, and are less likely to include major obstacles. This interpretation is broadly confirmed by teachers who mentioned barriers and other difficulties when the nearest park is too far. For example:

T4 (m) "...and moreover, we cannot take responsibility for the children crossing that road with its heavy traffic, during school time."

The most remarkable effect is that the relation also holds for other destinations than the nearest neighbouring green space. This is shown by the breakdown for the destination of the excursions by the nearest green space against all other destinations. As their numbers are moderately correlated ($r=.28$; $p<.05$), the relation with distance to green spaces follows a similar pattern (ln of distance) for both types of trips. Proximity of schools to nearby green urban space apparently is also a good predictor of the number of educational trips taken to more distant locations, although these trips are all to more remote locations, sometimes outside the city limits. Both correlations of number of trips with the distance to the nearest green space show the similar decline of trips as distance increases:

$$N_{\text{near green space}} = 3.42 - 0.43 * \ln[\text{distance}] - 0.27 * [\text{relig}_{(0,1)}] \quad R^2 = .244$$

$$N_{\text{other destinations}} = 4.91 - 0.61 * \ln[\text{distance}] - 0.93 * [\text{relig}_{(0,1)}] \quad R^2 = .232$$

Coefficient $[\text{relig}_{(0,1)}]$ only significant for ‘other destinations’ ($p < .10$).

Coefficients for average neighbourhood income not significant ($p > .10$).

The educational trips taken to other locations mostly had a destination in the Amsterdam metropolitan region, but all these destinations are in different parts of the town, much further than 800 metres. So we find excursions for environmental education to remote destinations to be explained by the availability of green space in the close proximity of schools, suggesting that the practice of outdoor environmental education is based on previous experiences. This remarkable result seems to suggest that once a practice has been established, it motivates schools to visit other environmentally interesting places as well.

T2 (f) After the two fieldwork classes in the park, I always ask them whether they would appreciate a field trip to the ‘Amsterdamse Bos’ [*forest; fig.1 C*]. There is always much enthusiasm, and after summer recess we go.

Most answers of teachers involved in environmental education were in line with the pattern of institutionalization of these environmental educational trips within the school’s curriculum. According to teachers, positive reinforcement of such practices comes from students and from parents. These outcomes suggest that the impact of green space on environmental education in schools goes beyond the significance of the proximity of these spaces for direct visits. For understanding this phenomenon we have started an extended study on the attitudes of teachers with regards environmental education, excursions, and available green space, about which will be reported later (XXX, in preparation).

6. Discussion and conclusion

The evidence that supports the hypothesis also includes the remarkable result that close proximity to urban green space also seems to reinforce fieldwork activities much further away. Lo and Jim (2012) suggest that when greenspaces are too small, and limited and surrounded by incompatible activities, they fail meet user expectations. The assumption that elimination of green spaces is limiting the options for schools to establish a practice of fieldwork in their environmental education seems to hold true. Barriers with ‘incompatible activities’, like intensive circulation as a most likely factor, seem to be the clear factor why we established a clear correlation between distance of school to green space and frequencies of excursions., though a correlation of course only suggests a causal effect. Whereas urban densification programmes are legitimized by claims that they support urban sustainability, the result of this study cast a new light on the other side of CC policies, particularly because this relation has never been associated with the sustainability claim for the CC but it came to the fore in a real urban densification conflict.

In section 2 the central proposition was formulated about ignorance of the recognition of the valuable contribution of citizens in urban development, in particular in cases of urban densification. The case study of the historic developments of adjacent green spaces in Amsterdam reveals that such densification projects may face strong opposition by residents, who generally feel that the decision-making processes was not just. They complain about a general pejorative approach trying to downplay all opposition to rather selfish protection of their own backyard, a practice that is common in decision-making that still follows the Decide-Announce-Defend (DAD) strategy. In particular the defence of densification decisions and legitimization in terms of improving the city's sustainability was criticized. Most opponents felt that their protective attitudes are also mainly based on valuing aspects of sustainability. Indeed, the CC is a sustainable city idea (Jabareen, 2006), and this argument has been used in Amsterdam for more than three decades to give the policy legitimacy. Nevertheless, this claim and the associated densification projects are constantly being challenged. Although the residents' counter arguments are also based on environmental considerations, their position is summarily dismissed by policymakers as if they only fear the effect on the value of their property (Sally and Koenig, 2012; Iglesias, 2002). Ruming (2014) criticized the categorization of local resistance as Nimby-ism because it obscures the motivation of ordinary citizens to participate in planning density debates, i.e. their wish to consolidate open spaces and prevent vegetation loss.

Both sides emphasize their own view of sustainability while falling deaf to the arguments of the other side. The denial of the validity of arguments against abandoning green space is felt as a lack of recognition, leading to a perception of 'unfairness' in the decision-making process. In such cases, mutual learning and inclusive policy-making fall victim. The validity of new, or sometimes previously ignored, arguments remains unexamined or underestimated. The empirical evidence presented in this study shows that the residents' position and arguments are grounded in strong, informed sustainability values. People value environmental education as important for general development of values and also because most of them had good experiences with it in elementary school, either as a child or as a parent. Outdoor excursions are crucial to environmental education (Mannion et al., 2013; Ballantyne and Packer, 2009), so the empirical evidence supporting the relation between proximity of schools to urban green space and the essential fieldwork excursions that support environmental education underscores the resident's sustainability argument.

In fact, the significance of good environmental education comes to the fore in two ways. First, the idea to provide an integrated place for environmental education is generally supported, also by the authorities in Amsterdam. The long existing programme of *schooltuinen* for primary schools, a citizens' initiative organized by a civil society organization, is supported and facilitated by the municipality. Nevertheless, as soon as these values, which partly result from the residents' experience with these environmental education programmes, are translated into action to preserve green space and oppose densification projects, they face resistance and the underlying reason behind the argument is challenged.

In addition to the significance of green space for respiratory health, physical exercise, general well-being, water management, and urban ecology, also the value of environmental education has entered the struggles around densification projects. This study shows that the number of environmental education excursions is indeed associated with the school's distance from the nearest green space. Reducing urban green spaces not only decreases visits to these nearby places but also seems to have a negative impact on all outdoor environmental educational activities. This is another strong argument in favour of the preservation of greenery and prudent consideration of densification projects in the context of CC policies. Such compelling – previously neglected – arguments can come to the fore only through an open deliberative process about urban densification.

However, within existing procedural frames, deliberation between contesting parties hardly provides the conditions that foster the recognition of different important stakes of various groups, including the value of environmental education of children. More than forty years after the conceptualization of the 'ladder of participation' (Arnstein, 1969) institutional frameworks continue to limit the fundamental right of participation to 'consultation' – 'inspraak' in Dutch – which according to Arnstein classifies as a 'degree of tokenism'. This the typical stage in the DAD model after the announcement of a project, and part of the defence is necessarily accompanied by neglect of arguments that were unrecognized in the decision and announcement stage, because the procedure did not allow an open process required for such learning in those stages. The resulting perceptions of lack of 'fairness of process' is a clear call for institutional conditions that support recognition and procedural fairness (Schlosberg, 2004; Agyemen, 2013). Procedural fairness refers to institutional settings of the process that allow certain actors, municipal governments, their agencies, and urban developers, to neglect and dismiss residential groups and the input of their arguments in the process. This leads to distrust because a felt lack of recognition, because recognition refers to the fundamental human need that feelings of dignity and integrity are supported by the treatment by others (Fraser, 2000).

The current institutional framework of planning systems often does not foster such recognition. In the case of Amsterdam, for example, while reviewing justice principles in the Dutch planning system, Needham (2007, p. 253) concludes that 'Dutch land use planning (...) is not designed to achieve distributive justice'. The Dutch planning system benefits the strongest in the process, which is usually the municipal government with public and commercial developers as their prime allies.

The need to establish frameworks that foster open processes, unconditional recognition of residents' stakes, and procedural justice is clearly applicable to decision-making processes for the preservation of urban green space. In the example presented here, it concerns arguments about the significance of green spaces for general well-being beyond direct and indirect health benefits. Environmental education should also be recognized as a viable stake in the urban development of green spaces, as it is a key value in the citizen's vision of a sustainable city.

Acknowledgement

The author would like to thank all respondents. The first wave of data collection, first year, of the schools' proximity to green space and the excursions was conducted by Marlise Meij.

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