



Original article

Swedish green space management – The managers perspective



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ABSTRACT

This study has initiated the first stages of assessing the current state of Swedish parks through the use of a comprehensive survey sent to all Swedish park managers during the spring of 2016. The aim was to review the state of the Swedish public parks and undertake an assessment and analysis of the key issues and challenges that public parks in Sweden are currently facing. The Park Managers Survey was carried out as an online questionnaire sent to all local community (municipal) park managers and park departments in Sweden. The survey addressed issues of finance and resourcing; the quantity and quality of parks being managed; organizational arrangements for maintenance; information on park visitors and volunteers; and, issues of strategic policy making. The Swedish municipal green space managers regard the current quality of their green spaces to be fine and budgets for upkeep sufficient, just as they look optimistically into the nearest future. Their nearest future does not seem to have focus on voluntary support and alliances with local stakeholders in relation to the actual maintenance of green spaces. Both these trends contradict their UK counterparts. Swedish managers seem to be building a strong organization internally, and do not expect to increase the current use of private contractors. In general, we conclude that Swedish green space managers look optimistically to the nearest future.

Introduction

Urban green spaces provide a number of ecosystem services, e.g. regulating, producing and cultural as described in the Millennium Ecosystem Assessment Report (Maes et al., 2013; McGranahan et al., 2005). These are particularly important in an era of continued urbanization (United Nations, 2014). The urban population in Sweden is estimated to be 84% (World Bank, 2016), and thus urban parks and other green spaces constitute a central part of most Swedes everyday life.

Urbanization and other grand societal challenges such as climate change (IPCC, 2014) and demographic changes (Eurostat, 2015) have created new societal realities which provide a new context for urban green spaces, their use, and their management. The sustainable supply of ecosystem services depends not only on the presence of green spaces but also on the management of the ecosystems hosted (McGranahan et al., 2005; Randrup and Persson, 2009). In Sweden, almost 17 billion SEK (1.8 billion Euros) are used annually to manage urban green spaces (Persson et al., 2014) and green space management is distributed among at least 40,000 individuals, incl. those in local governmental authorities, public and private housing companies and organizations, estate companies and regional authorities. So, even though management of green spaces is widely acknowledged for its important contribution to e.g. sustainable development (Council of Europe, 2000;

James et al., 2009), green space management is fragmented and often seen as a subset of other management routines, e.g. housing and roads.

In the literature, management has been defined as encompassing both maintenance and management. The European Landscape Convention (Council of Europe, 2000), defines management as an action to ensure the regular upkeep of a landscape, which are brought about by social, economic and environmental processes. Jansson and Lindgren (2010) defined landscape management as “the activities performed by a management organization in order to maintain and develop existing urban green space for users”, and Dempsey and Smith (2014) described management as “maintaining and enhancing (a place and) its quality to maximize the benefits for users”. Randrup and Persson, (2009) argued that “long-term management” includes both the operational maintenance as well as long term planning, which is in line with the more recent definitions of Jansson and Lindgren (2010).

Neal (2014, 2016) proved that a number of challenges exist in managing public green spaces in the UK. The current state of urban parks and green spaces in the UK is dominated by maintenance budgets being reduced, and capital which will be less available for improvements. While park usage is increasing and local communities are taking on a greater role in the actual management of the green spaces, these facilities are becoming more costly to use and some parks may simply be sold or transferred to the care of others (Neal, 2014, 2016). The UK study was meant to guide planners, managers and users to prioritize

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and take actions in the future. We do not know if such scenarios are also evident for Sweden, since a national survey on the state of Swedish parks has until now not been carried out. However, the UK example may serve as inspiration to Sweden, since many aspects in organizing, managing and maintaining urban parks are similar between the two countries (Lindholm, 2009). Thus, there is reason to believe that the findings from the UK survey may be relevant in Sweden too, as our overall hypothesis is that there is a general downsizing of the Swedish public park organizations (Randrup and Persson, 2009; Persson et al., 2014), and that this affects the quality of public green spaces in a way which is notable by the general public (Neal, 2014, 2016). If our hypothesis is verified, we will be able to address why, and suggest means to alter this trend.

The objective of this study was to undertake an assessment and analysis of the key issues and challenges that public parks in Sweden are currently facing. By focusing on a broad range of information relating to both finance and resourcing; the quantity and quality of parks being managed; organizational arrangements for maintenance; and, issues of strategic policy making, we will generate a number of indications which will make it possible to discuss and develop the future of public parks in Sweden on a higher level.

Hypothesis building

Hypothesis 1: green space management in Sweden is primarily an operational activity

Randrup and Persson (2009) described the need for a strict distinction between the terms management and maintenance, where green space maintenance relates to the technical and operational aspects of managing green spaces. Vogel et al. (2017) defined the relationship between management and maintenance as 'strategic management' in which maintenance constitutes one of several activities. A 2005 survey of public green space management in the five Nordic countries (Norway, Sweden, Denmark, Iceland and Finland) showed that approximately 80% of all resources, time and money, were spent on operational measures (Randrup and Persson, 2009). The authors did not conclude whether this figure is high or low, but indicated that there may be a tendency among green space managers to focus on 'the immediate', the technical, and the operational.

There is a risk that the more long sighted and visionary discussions about what urban green spaces should be used for is neglected if the majority of a green space managers time is related to operational issues. In an ecosystem service perspective this may lead to lack of fulfillment of the green resources. For this study we thus developed the hypothesis (I) that in Sweden green space management is primarily an operational activity.

Hypothesis 2: the quantity of green space being maintained on contracts has levelled off in Sweden

Since the 1980s, green space management in many OECD countries have applied outsourcing as a steering mechanism, thus contracting out partly or completely the provision of maintenance of green spaces (e.g. Boyne, 1998). The main aim of competitive tendering and contracting out in the public sector has typically been to reduce cost of the relevant services, i.e., green space maintenance (see e.g., Hodge, 2000). According to Neal (2016), approximately 42% of local authorities in UK contract out partly (23%) or completely (19%) maintenance of their green spaces. Contracting out became commonplace among local authorities in Sweden in the early 1990s (Persson, 1996), and this followed a trend of outsourcing green space maintenance in Scandinavia (Lindholm, 2009). According to a 2013-survey among municipal park managers in Denmark and Sweden (Persson et al., 2014) about 79% of all municipalities in Denmark and 59% of all municipalities in Sweden contracted out partly or completely the maintenance of their green

spaces. Building on Hypothesis I, we hypothesize (II) that the quantity of green space being maintained on contracts has levelled off in Sweden, according to Swedish green space managers.

Hypothesis 3: green space budgets, staff numbers and overall quality have decreased in Sweden

In the UK, 92% of the park managers had experienced cuts to their budgets over the past three years (Neal, 2016), which was an increase of 6% from 2014 (Neal, 2014). According to the same study, 55% of park managers expect their park budgets to be cut by 10–20% over the next three years. Budgets for the park authorities has proven to be difficult to estimate, primarily because green space management at the local governmental level covers many different types of areas (e.g., Cvejić et al., 2015), and thus also many different divisions, departments and jurisdictions within the same governmental arena (Randrup and Persson, 2009). In order to test if the Swedish park managers experience the same budget cuts as the British, and to create a basis comparison between the two countries, we formulated the following hypothesis (III); There is an experienced decrease in Swedish park management budgets as well as in staff numbers and green space quality.

Methodology

The survey was developed based on a similar study being performed in the UK, and published in 2014 (Neal, 2014). This was combined with an American study on urban trees, performed and published in 2016 (Hauer and Peterson, 2016). The leading researchers behind these two studies were contacted and their experiences and recommendations have been included in the preparation of the survey.

Pilot study

A preliminary version of the survey was tested among 13 Swedish municipalities. The municipalities answered all questions via the digital survey-tool Netigate (Netigate AB, Sweden). All answers were analyzed and used as background for a workshop held at the Swedish University of Agricultural Sciences (SLU) during the spring of 2016. At the workshop the municipalities commented and discussed questions and answers. After the workshop, the survey was altered according to the workshop discussions. The revised survey was sent to all 290 Swedish municipalities during the early spring of 2016.

Survey content

The survey was focused on overall management and maintenance of green spaces and urban trees:

- Budget/Financing included questions related to the public authorities economic situation and specifically which economic resources are present in relation to management of green spaces and trees. Questions even included information related to the historical development and to which degree the managers viewed future resource allocations.
- Maintenance of green spaces and trees included questions related to the daily maintenance, e.g., related to personnel, type of businesses being used (public/private), total amount of green spaces/trees, as well as how these have developed over time and how they are expected to be developed in the future.
- Policy, plans and strategies included questions about the strategic documents used in order to steer and develop green spaces/trees.
- Quality included questions related to the manager's perceived quality of the green spaces and urban trees.
- Tree inventories included questions specifically related to urban trees, e.g. about management systems such as tree inventories and

use of digital data systems.

Survey distribution

All 290 Swedish municipal homepages were retrieved in December 2015 in order to generate right contact names and addresses. Personnel with the highest responsibility for green spaces and trees were selected as contact persons. If more than one person was identified, all were included as recipients of the survey. The actual distribution of the survey and reminders was carried out via e-mail, with four reminders being sent to all non-respondents two, three, four and eight weeks after the initial distribution.

Written answers retrieved via ordinary mail was typed in manually to Netigate before all responses was downloaded to Microsoft Excel 2010 (Microsoft Corporation, USA). All answers were evaluated manually for obvious errors, and in this process eight double answers were deleted. In cases when a municipality had submitted two answers the most recent and most comprehensive answers were kept. Also, surveys including less than 10% answers were deleted.

Response rate

In total 161 surveys (55.5% response rate), were included in the dataset, and formed the basis for further analysis. This is regarded as a very good response rate, seen in relation to similar studies carried out in Sweden having had response rates at approximately 30% and 52% respectively (Randrup and Persson, 2009; Nielsen et al., 2013).

Statistical approach

We modeled the relationship between survey answers as binary or ordinal variable depending on the question using logistic regression in Proc Logistic in SAS 9.4. Explanatory variables were;

- a) Population (SCB, 2015).
- b) Park budget per inhabitant (SCB, 2015).
- c) The Nomenclature of territorial units for statistics (NUTS), (EU, 2015). NUTS is a hierarchical system for dividing up the economic territory of the EU for the purpose of the collection, development and harmonization of European regional statistics. We used NUTS Region Level 1.
- d) Percentage outsourced of the operational management.
- e) The municipality has a strategic plan as a binary variable.
- f) Lack of a quality system as a binary variable.

Odds ratios were modelled as the probability of ‘Yes’ for the binary variables and as ‘Positive/Increasing Rankings’ for ordinal variables. Stepwise selection with inclusion level of 0.05 was used to find the most parsimony models. However, for testing the strategic approach to management, the lack of a quality system was used as response level due to a large variety of systems noted in the survey.

To test if the selected model was adequate, a Residual Chi-square test was used. Score tests was used to control that the proportional odds assumptions was upheld for the ordinal models and when adequate it was complemented with Hosmer and Lemeshow Goodness-of-Fit Test. To explore the relationship between the multiple answer questions concerning what type of written goals there was for green spaces the binary matrix of the answers was analyzed against the same explanatory variables as in previous logistic regressions using a Multivariate Regression Tree (Therneau et al., 2013; Ouellette and Legendre, 2013). The response matrix was Chord-transformed to linearize the data and selection of the most parsimony multivariate regression tree was based on minimization of the cross-validate relative error. Indicator variables for the different branches of the regression tree and significant coding for them where added (Borcard et al., 2011).

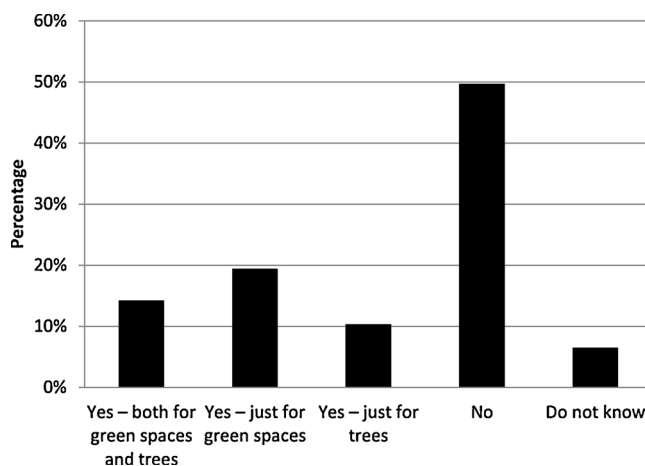


Fig. 1. Does the municipalities have written goals for green spaces related to e.g....? (N = 162). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Test of representativeness

The response rate relates to a fully representative distribution based on Sweden’s Municipalities and Counties administrative borders (Sveriges Kommuner och Landstings, SKL). To test this, we used a Chi-Square test (Olsson, 2011) with an expected distribution of all answers related to the total distribution of the various municipal groups. The results shows that the geographical distribution of answers does not significantly differ from a random selection of municipalities (p -value = 0.435). Further, we did not find that any significant variation between the answering municipalities dependencies on size (ha), and number of inhabitants. We therefore conclude that the dataset is representative for Sweden and the following results.

Results

Hypothesis 1: green space management in Sweden is primarily an operational activity

Fig. 1 shows that nearly one in two green space manager does not have a strategic plan for the green spaces they manage. Every third (34%) have a plan which includes green spaces with or without trees. Fig. 2 shows that the most frequent themes to be covered in the strategic plans are biodiversity, distance to the nearest green space, storm

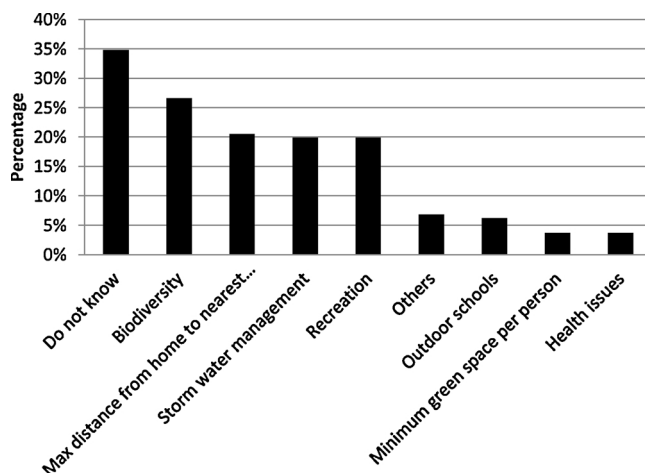


Fig. 2. Does the municipalities have written goals for green spaces related to e.g....? (N = 162). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Table 1
Results from modelling the relationships between survey questions and explanatory variables using logistic ordinal and binary regression with stepwise selection of variables with inclusion level of 0.05. Odds ratios modelled as the probability of Yes for binary variables and positive/increasing rankings for ordinal variables.

Question/Response variable	Population in the municipality	Park Budget Per Inhabitant	Region NUTS1 SE1 vs SE2	Region NUTS1 SE1 SE3	Region NUTS1 SE2 vs SE3	Percentage of Consultants	The municipality has a strategic plan	The municipality has a quality system
Increase in Budget 2013–2015 (Ordinal 3 levels)						1.009 * (1.000–1.017)		
Increase in Budget 2016–2018 (Ordinal 3 levels)			4.628 ** (1.796–11.925)	2.742 ** (1.191–6.315)				
Increase in Budget compared to others (Ordinal 3 levels)						1.009 * (1.000–1.019)		
Budget is sufficient to upkeep quality (Binary)						1.012 ** (1.003–1.021)		
Increase in Planning personal 2013–2015 (Ordinal 3 levels)	1.000009 ** (1.000002–1.000016)							
Increase in Operative personal 2013–2015 (Ordinal 3 levels)								
Increase in green space area 2016–2018 (Ordinal 4 levels)			3.565 ** (1.493–8.513)	3.529 ** (1.617–7.704)				
Management type for Urban Green will change 2016–2018 (Binary)								
Urban trees population will increase (Ordinal 4 levels)		1.001 * (1.000–1.0029)	3.323 ** (1.446–7.633)	4.592 ** (1.771–11.908)				
Trees will change 2016–2018 (Binary)								0.469 * (0.237–0.926)
How do you rate the quality of your green space today (Ordinal 3 levels)								0.498 * (0.255–0.975)
How have quality changed during 2013–2015 (Ordinal 3 levels)								
How will quality change during 2016–2018 (Ordinal 3 levels)								
Do you have a strategic green space/tree plan (Binary)	1.000016 * (1.000004–1.000028)		6.516 *** (2.055–20.667)	5.149 *** (1.789–14.821)			Not included in this individual model	1.189 ** (2.577–5.581)
Not having a quality system (Binary)							Not included in this individual model	Not included in this individual model

Significant Point estimates of odds ratios adorned with significance codes: ***** 0.001 *** 0.01 ** 0.05 are presented with 95% Wald Confidence Limits below. Regional classification and nomenclature is from the Level 1 NUTS classification (Eurostat, 2015) and point estimates are for the pairwise comparison between the different region.

water management issues and recreational issues. It is noteworthy that themes like outdoor schools (learning with nature), and health issues are only covered in very few strategic green space documents.

We found a higher probability that municipalities which had a strategic plan also lacked a quality assurance system (Table 1), indicating that either focus is on strategic and long-sighted management, or it is on short-term operational issues. However, we conclude that the majority of Swedish green space managers do not have a strategic plan for long-sighted green space management. The presence of a strategic plan was positively associated with higher populations, and with the Southern and Eastern NUTS regions (Table 1), which are also the Swedish regions with the densest populations and the largest cities.

This result was enforced by the Multivariate Regression Tree (Appendix A) that showed that municipalities with more than 53910 inhabitants (corresponding to the 85th percentile) were significantly more likely to have written goals for green spaces. For the smaller municipalities the probability for having written goals increased with higher budget and the presence of a strategic plan.

In general, we found a slight increase in those municipalities which do have an increased strategic approach since 34% of all municipalities in this survey stated that they do have a plan, while similar numbers from the 2005 survey were 25–30% (Randrup and Persson, 2009). Our findings suggest that green space management in Sweden is still primarily related to operational activities and especially in smaller municipalities, which is in line with findings from previous studies (Randrup and Persson, 2009), and is aligned with findings from e.g. the UK (Neal, 2016).

Hypothesis 2: the quantity of green space being maintained on contracts has levelled off in Sweden

Outsourcing of municipal services has been intensively debated during recent decades (e.g. Carr et al., 2009 and Domberger and Jensen, 1997). Most municipalities use outsourcing (or private contracting) as one of several forms for maintenance service. This can be as the main service form, as a complementary service form, or as an ‘add on’ to the municipalities own service provision (e.g. Hansson and Knutsson, 1991), and thus, partly or completely outsourcing is the norm in most Swedish municipalities (Lindholt, 2009).

In this survey, we asked who actually carried out the maintenance; The municipality themselves or a private contractor. The results showed that 68.3% of all municipalities (N = 155) carry out the maintenance of green spaces themselves, and 29.2% used a private contractor. Bretzer et al. (2016) found that 42% of all Swedish municipalities used in-house provision only, while 12% used private contracting only. Thirty-three percent used a mix of in-house provision and private contracting. According to a 2013-survey among municipal park managers in Sweden, 59% of all municipalities contracted out partly or completely the maintenance of their green spaces (Persson et al., 2014). These figures indicate a fall in actual outsourcing, and thus in the use of private contractors in Swedish municipal green space management. According to this study, the outsourcing rate as being stable as 93.2% of all managers did not expect to see a change in this during the next three years. Only 2.5% involved volunteers in maintenance tasks, even though 12.3% stated that they collaborated with volunteers/partners in the upkeep of green spaces and/or trees. Practically no one planned to transfer the maintenance as a part of a voluntary routine (93.2%, N = 135), indicating that the Swedish managers do not have intentions of involving users, NGO etc. in the actual maintenance.

Hypothesis 3: green space budgets, staff numbers and overall quality have decreased in Sweden

Table 2 show the experienced changes in budgets and staff number during the last three years (2014–2016), and Table 3 the expected changes in budgets and staff numbers during the coming three years

Table 2
Changes in budgets.

	Experienced during the last three years	Expected during the coming three years
N	155	146
Reduction:	18.6%	22.3%
No changes:	54.0%	54.1%
Increase:	23.6%	14.9%
Do not know:	3.7%	8.8%

Table 3
Changes in staff numbers.

	Experienced during the last three years	Expected during the coming three years
N	151	152
Reduction:	12.6%	17.6%
No changes:	69.2%	66.0%
Increase:	16.4%	11.9%
Do not know:	1.9%	4.4%

(2018–2020). The majority of the Swedish managers have not recently experienced changes in budgets and staff numbers, just as they do not foresee such changes in the near future either. However, every fifth do experience or foresee reductions in budgets and every sixth experience or foresee reductions in staff numbers. Similar numbers can be experienced in relation to perceived increases in budgets and staff numbers.

The vast majority of managers rate the current quality of the green spaces to be ‘good’ or ‘OK’ (total of 91%), and the majority of the managers are even optimistic about the future, as almost 50% expects the quality to increase in the future. In general, the municipalities with a quality assurance system perceived the quality of their green space quality higher than those without a quality assurance system (Table 1). However, 60.6% state that the current budgets are not sufficient for upkeep of the quality, and 49.4% expects an increase in the amounts of green spaces to be managed. So, even though the current quality may be regarded as good, the survey indicates a future conflict between keeping the current (highly rated) quality within the current budgets, because there is a general expectation of an increase in the amount of green spaces to be maintained (Table 1).

We found links between budget optimism and the use of private contractors, as municipalities which expected an increase in budgets also had a higher probability of using private contractors (Table 1). Likewise, municipalities with higher use of private contractors felt that they had a sufficient budget (Table 1).

In summary, the qualitative analysis of the survey data indicates that the Swedish municipal green space managers are generally optimistic about the future management of the urban green spaces. They regard the quality to be fine and budgets sufficient, just as they look optimistically into the nearest future. They seem to be building a strong organization internally, and do not expect to increase the current use of private contractors. Currently, they do not seem to have focus on voluntary support and alliances with local stakeholders in relation to the actual maintenance of green spaces. The survey indicates a potential future conflict between expected increases in areas to be managed while budgets are not believed to increase accordingly.

Discussion

Compiling a good evidence base on a national scale is a complex task. The difficulty is compounded by the fact that there is currently no information regularly collected in a standard format for parks and urban trees across the whole of Sweden. Past and present data is fragmented and generally of mixed and variable quality. It can be difficult

to access and analyze data and has often been gathered in different and often incompatible ways using a variety of methodologies. We believe that the survey conducted in this study can serve as a future basis for similar studies, allowing us (or other researchers) to carry out longitudinal studies over time.

Compared with a similar survey carried out in the UK in 2014 and again in 2016 (Neal, 2016), reveals that the Swedish park managers perceive the situation in Sweden as more optimistic than in the UK. Sweden, as one of the Scandinavian welfare states, might not be directly comparable to the UK regarding the last decades development within the public organization and especially in relation to green space management (Hansen and Lindholm, 2016).

Swedish managers seem to be building a strong organization internally, and do not expect to increase the current use of private contractors. In the early 1990'es it was predicted that the Swedish park management organizations would soon divide into purchaser and provider organizations, but that a united organization at that time was still the norm as only very few municipalities had changed their own operational organization with private businesses (Nilsson, 1993). However, contracting out of green space maintenance services has become widespread among local authorities in countries like e.g. Sweden with a history of less restrictive policies and regulations for contracting out, and a traditional large role for the public sector. Therefore, and as the green space management structure in Sweden is comparable to the other Scandinavian countries (Randrup and Persson, 2009, Bretzer et al., 2016, Leiren et al., 2016), it could be interesting to make a cross-Scandinavian comparison in order to better understand the details of this study. Further, the survey showed that Swedish managers do not currently seek funding from other sources than the taxation, just as active participation from users, NGO's etc. is limited in the operational maintenance. This is noteworthy as the general international trend is quite clear in relation to the need for, and values of integrative public participation, – also in green space maintenance activities (e.g.

European Landscape Convention, (Council of Europe, 2000), and the European Environments assessment of global megatrends (EEA, 2015). Other contemporary trends such as human health (WHO, 2016) or outdoor schooling (Bentsen et al., 2009) were not among the themes usually being included in Swedish municipal green space strategies (Fig. 2). The reasons for this is unclear, but could be linked to the fact that urban green space provision is, and has always been a public tax-paid good in dense communities.

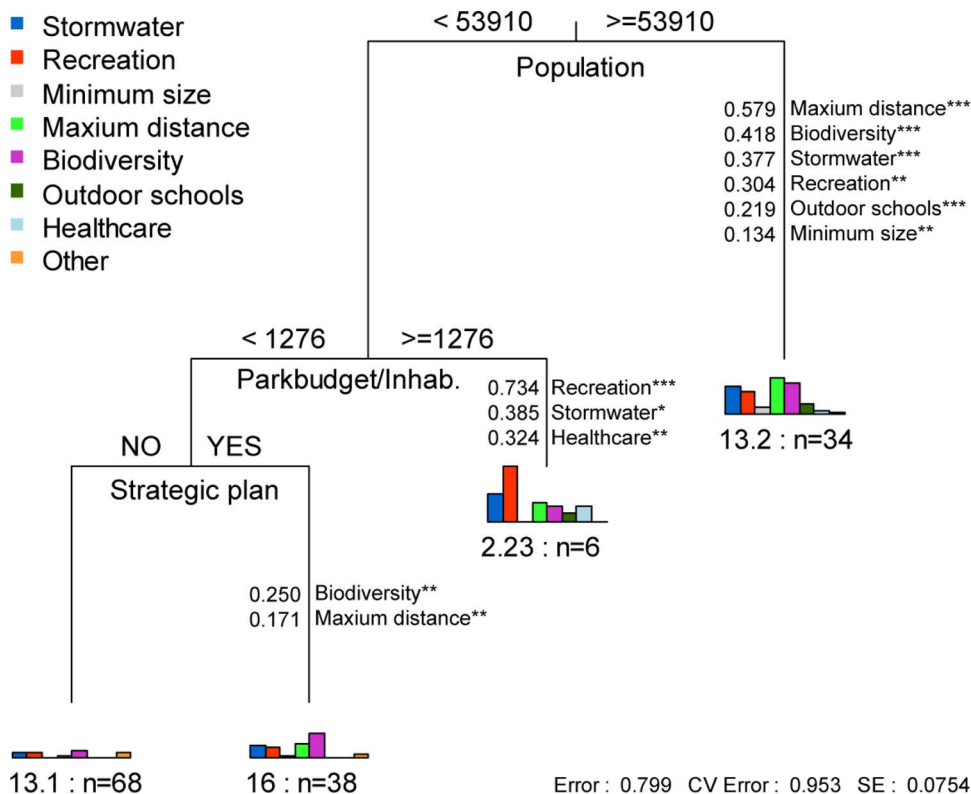
Conclusion

The Swedish municipal green space managers regard the current quality of their green spaces to be fine and budgets for upkeep sufficient, just as they look optimistically into the nearest future. In general, Swedish green space managers look optimistically to the nearest future which contradicts their UK counterparts. Most likely, there is a possible link between the stability of the national Swedish economy and the country as such being among the riches in the world (e.g. OECD, 2017), and the limited managerial perception of needs for involvement of private contractors, users or alternative incomes to the tax-paid funding. However, as a general trend, the users of green spaces are showing an increased interest in local areas, local developments, local use and local produce (e.g., Eggermont et al., 2015; Buijs et al., 2016; Randrup et al., 2016), and therefore increased public involvement in green space management poses a potential for future cooperation and development of Swedish green space management.

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Appendix A. Result of the multivariate regression tree of question concerning written goals



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