

Opportunities and Challenges for the Integration of Green Qualities in the Densification of Regional Cores of Stockholm

Sara Khoshkar^{1*}, Juan Azcárate¹, and Berit Balfors¹

¹*Department of Sustainable Development, Environmental Science and Engineering
KTH Royal Institute of Technology, Stockholm, Sweden*

Abstract: Urban densification is claimed to enhance sustainability of cities, with the primary aim of centralizing services and reducing urban land take. Urban densification is expected to reduce car dependencies, facilitate walking, biking and public transport, and protect rural green spaces. However, densification can pose threats to green spaces and green qualities within urban areas. A significant challenge for planners is implementing densification projects while also providing sufficient urban green spaces with green qualities. This paper examines three cases in the suburban Stockholm region, wherein the Stockholm Regional Planning Office has plans to densify to reduce social and environmental pressures from the inner Stockholm region. A study was conducted with semi-structured interviews, field visits, and literature reviews as the primary means of data collection. This study identified the challenges confronted by municipal planners when incorporating sustainability in planning by enhancing, preserving, or integrating green qualities in urban densification plans. A few challenges included lack of collaboration and communication and lack of knowledge about green qualities. The interviews further revealed that impact assessment (IA) tools, such as EIA and SEA, were not being used to their fullest potential when planning for green qualities in densification plans. This paper analyses the findings and identifies opportunities to improve IA tools for sustainable planning in order to integrate green qualities in planning, as well as to address the identified challenges.

Keywords: Green space, green qualities, urban densification, sustainable urban planning, EIA, SEA

1. Introduction

Over the past century, the world has urbanized at an accelerating rate, with more than 50% of the global population now living in urban areas (Wu, 2014). By 2050, the global urban population is estimated to be 6.3 billion, nearly doubling the 3.5 billion urban dwellers worldwide in 2010 (SCBD, 2012). Urbanization implies great pressure on natural resources and the environment (Rees and Wackernagel, 1996). As a result of urbanization, the amount of land exploited for roads and buildings has increased at the expense of the already limited parks and green spaces, modifying the ecology of the landscapes (Sandström, 2002).

Many actors in planning view the densification of urban areas as a solution to the adverse impacts of urbanization and a way of achieving sustainability. This form of development aims to centralize services and reduce urban land take (van Diepen, 2002). It is claimed to reduce urban sprawl, as well as provide significant long-term social and ecological benefits (Jenks et al. 1996). However, the growing emphasis on the need for urban densification has raised questions about the role of green space in this model and how it will change the green qualities of urban areas themselves (Baycan-Levent and Nijkamp, 2009; Tratalos et al., 2007).

Green qualities are the properties and potentials of urban green spaces that are important in providing benefits (ecological, health, quality of life, economic) for urban areas (Jansson, 2014). As a result, the interest in urban green spaces has increased, and the ways in which these green spaces can benefit cities and their inhabitants have become key issues in urban planning (Sandström, 2002).

Specifically in the Stockholm region and in its surrounding counties, it is estimated that the population will grow between 200,000-400,000 inhabitants by 2030 (Johnson, 2012). This rise in population is predicted to bring many economic and social opportunities. However, it may also exert pressure on the land, transport infrastructure, and the already struggling housing sector. Finding solutions to cope with this population growth, while simultaneously safeguarding the region's assets for future needs is a major challenge (Office of Regional Planning of Stockholm, 2010).

In order to relieve the anticipated pressures from this population increase in the inner city of Stockholm, a solution set by the Regional Planning Office of Stockholm is the development of eight denser sub-regional cores around the central urban core of Stockholm, offering a wide selection of services, workplaces, and cultural events in order to attract more inhabitants (Office of Regional Planning of Stockholm, 2010). This would make the urban structure in the region denser and more polycentric. Four of the regional cores are located in municipalities south of Stockholm, each of which have unique rural and urban green structures providing many green qualities. With the plans for densification, the urban green spaces inside each core area may be threatened, taking away or negating their green qualities. This is of concern as urban green spaces are a significant element for the sustainable development of cities (Baycan-Levent et al., 2009).

A challenge faced by planners today is balancing urban development interests against the need to protect ecologically functional green spaces (Erixon et al., 2013). Therefore, this study aims to identify the challenges faced by planners when incorporating sustainability in planning by enhancing, preserving, or integrating green qualities in urban densification plans. The study further discusses the role of impact assessment (IA) tools such as environmental impact assessment (EIA) and strategic environmental assessment (SEA), which could facilitate the integration of green qualities and aid in overcoming the challenges, thereby facilitating sustainable urban planning.

2. Methods

In order to conduct this study, a qualitative research approach was taken. Three case studies were selected as a part of the research design. These case studies included three of the regional cores located in the south of Stockholm. The primary method for gathering data consisted of eight “semi-structured interviews” along with site visits (Kvale, 2009). In these interviews, the planners were asked to describe their on-going and planned projects for densification based on the vision set at the regional level, the green qualities considered important for their municipalities, and the challenges when integrating green qualities, as well as the role of IA tools in their planning.

These interviews were transcribed and a thematic analysis approach was adopted. Thematic analysis involves the analysis of qualitative data to extract key themes from one's data (Bryman, 2012). From the analysis, the identified challenges planners faced when integrating green qualities in their densification projects were clustered into four broad categories:

collaboration, green quality management, implementation of densification, and tools. The role of EIA and SEA to facilitate the integration of green qualities into urban densification plans and to overcome the identified challenges was then explored.

3. Challenges of Integrating Green Qualities

When it comes to land use planning, conflict arises for several reasons, including the competing demands for the use of land, uneven distribution of costs and benefits resulting from the development, and the environmental impacts arising from land use changes (Short et al., 2013). Similar challenges were confronted in the municipalities of interest, in addition to many others. As mentioned, these challenges were clustered in four broad categories: collaboration, green quality management, implementation of densification, and tools. In this paper, only a few of the challenges within these categories will be discussed. These challenges include: a lack of collaboration and communication; lack of knowledge regarding green spaces and qualities; and the inefficient use of IA tools.

3.1 Collaboration and Communication

Weak collaboration and communication were found to exist amongst the various municipal departments in all three of the case studies, creating professional barriers as well as hindering the exchange of knowledge between them.

As stated by Håkansson (2000), “a municipal public administration is not a unified organization, but is instead populated by a number of different professional groups, each an expert in its own field. Experts belong to various municipal administrative units, all of which have developed their own traditions and procedures, which influence their work.” This separation amongst the municipal departments was quite evident in the municipalities. Each department was focused on their specific specialization, often overlooking and not showing interest in issues outside of their professional knowledge, such as green qualities.

One interviewee recognized the importance of communication and collaboration amongst municipal departments and the elimination of professional barriers in order to incorporate green qualities in the densification plans and projects. Another interviewee mentioned that with improved communication and collaboration the different municipal departments could share and develop knowledge and thereby bring their professional expertise to bear on integrating green qualities. However, even with the understanding and acceptance of the importance of collaboration and communication, methods for collaboration were not well developed.

3.2 Lack of knowledge

Another challenge revealed in the interviews was the lack of knowledge regarding the value of existing urban green spaces, as well as the qualities associated with them. This problem led to many other challenges. The lack of knowledge on green qualities of cities or urban regions leads to land use planning and management decisions based on inadequate information on the benefits that humans can derive (Niemelä et al., 2010). This was quite evident in the municipalities. The lack of knowledge regarding the value of certain green spaces led to challenges in decision-making regarding where to develop for human benefits rather than biodiversity and vice versa. Moreover, it was difficult for the municipal planners to decide which urban green spaces to enhance, preserve, or integrate in the municipal densification

plans and projects. Furthermore, this lack of knowledge led to a conflict of views between the developers and planners. This was mostly due to developers not being aware of the long-term benefits of enhancing, preserving, or integrating green qualities simultaneously with the development. The planners revealed that in most cases the developers were more concerned for the short term-economic benefits, rather than the long-term environmental and social benefits.

3.3 Tools

Policies and tools are not well developed for green space planning (Pauleit al., 2003). Baker et al. (2013) also mention that IA tools are being viewed more as a hurdle rather than a useful tool for decision-making. When the municipalities were asked specifically about the role of SEA and EIA for the integration of green qualities into their densification plans and projects, many revealed the limited use of these tools. In most cases, the proposed development projects were foreseen to not have negative impacts, overlooking the potential impacts on surrounding urban green spaces; and so they were screened out at a very early stage. Also, most of the municipal comprehensive plans lacked focus on green qualities. In the instances when EIA or SEA was used, they were limited to the assessment of impacts while poorly addressing mitigation and compensation measures, as well as monitoring plans. For example, at the project level, where development was proposed on existing urban green spaces, the local residents were promised compensation with a more 'attractive' green space elsewhere. However, a clear compensation plan did not exist, nor did a monitoring plan to ensure that the new green space provided the same or nearly the same qualities as the green space that would be lost. The interviewees further mentioned it is often the case that when one development project is finished, the next one begins, without monitoring the previous project and the implemented mitigation and compensation measures of the previous project.

4. Exploring the role of SEA and EIA

The analysis of the interview responses revealed that the efficient use of IA tools such as EIA and SEA could be a possible solution to overcome the identified challenges and more effectively integrate green qualities in urban planning.

SEA has the potential to act as a mediating instrument, steering the assessment to facilitate the integration of environmental values into the decision-making process (Vicente and Partidário, 2006). Therefore, SEA can serve as a platform for communication and collaboration, as well as facilitate the exchange of knowledge, allowing for a consensus to be reached amongst the different stakeholders with respect to the integration of green qualities in municipal densification plans.

Apart from the conventional SEA approach which is exemplified by the European Union Directive on SEA (OJEC 2001), many approaches to SEA have developed over the years (i.e., Strategic-thinking SEA and Ecosystem Service inclusive SEA), implying that this tool is adaptable and can be tailored for different contexts (Geneletti, 2013; Partidario and Gomes, 2013). For the purpose of the three case studies, SEA could be used by the municipalities at a more strategic level to formulate guidelines and shape the dense development while bringing focus to green qualities in the process. EIA could serve to implement the SEA outcomes and enable project-specific follow-up. Therefore, in the context of the case studies, through the application of SEA, a general strategic plan for the dense development of the municipalities can be shaped with special focus on urban green spaces and qualities. Strategies and measures

for integration, preservation, and/or enhancement of urban green spaces and green qualities can be developed and assessed. As follow-up, an EIA can be carried out for the individual projects to ensure that urban green spaces and their qualities are not impacted, the strategies and measures set through the SEA are fulfilled, and mitigation and compensation measures are clearly established for the lost green spaces. This form of tiering leaves potential to carry sustainability principles from the policies and plans to the projects (Shepherd and Ortolano, 1996).

5. Conclusion

The interviews revealed that the integration of green qualities in the densification plans and projects of Swedish municipalities of interest brings forth many challenges to the planners. All three municipalities were confronted with similar challenges. Communication and collaboration must be strengthened in order to build a consensus amongst stakeholders on how the dense development should take place with green qualities as a priority consideration amongst other planning issues. Furthermore, effective communication and collaboration can aid in eliminating the challenges arising from the lack of knowledge regarding existing local urban green spaces and the qualities associated with them. SEA and EIA are both tools that can facilitate the integration of green qualities in densification plans and projects and aid in sustainable planning, if used to their fullest potential. Urban green spaces are found to be liveable-city ingredients and their importance is being recognized internationally (Jim, 2002). As the global population will continue to grow, a balance will be needed between the preservation and development of green spaces in the urban areas.

References

- Baker, J., Sheate, W.R., Phillips, P., Eales, R., 2013. Ecosystem services in environmental assessment — Help or hindrance? *Ecosyst. Serv. EIA SEA* 40, 3–13.
- Baycan-Levent, T., Nijkamp, P., 2009. Planning and Management of Urban Green Spaces in Europe: Comparative Analysis. *J. Urban Plan. Dev.* 135, 1–12.
- Baycan-Levent, T., Vreeker, R., Nijkamp, P., 2009. A Multi-Criteria Evaluation of Green Spaces in European Cities. *Eur. Urban Reg. Stud.* 16, 193–213.
- Bryman, A., 2012. *Social research methods*, 4. ed. ed. Oxford : Oxford University Press, Oxford.
- Erixon, H., Borgström, S., Andersson, E., 2013. Challenging dichotomies – exploring resilience as an integrative and operative conceptual framework for large-scale urban green structures. *Plan. Theory Pract.* 14, 349–372.
- Geneletti, D., 2013. Ecosystem services in environmental impact assessment and strategic environmental assessment. *Ecosyst. Serv. EIA SEA* 40, 1–2.
- Jansson, M., 2014. Green Space in Compact Cities: The Benefits and Values of Urban Ecosystem Services in Planning. *Nordic Journal of Architectural Research* 2, 139–160.
- Jenks, M., Burton, E. and Williams, K. (1996). *The compact city, a sustainable urban form?* E & FN Spon: London, U.K.
- Johnson, G., 2012. Stockholm 2030, in: Bazzanella, L., Caneparo, L., Corsico, F., Roccasalva, G. (Eds.), *The Future of Cities and Regions*, Springer Geography. Springer Netherlands, pp. 65–98.
- Jim, C.Y., 2002. Planning Strategies to Overcome Constraints on Greenspace Provision in Urban Hong Kong. *Town Plan. Rev.* 73, 127–152.
- Håkansson, M., 2005. *Kompetens för hållbar utveckling : Professionella roller i kommunal planering.*

- Kvale, S., 1938-, 2009. *InterViews : learning the craft of qualitative research interviewing*, 2nd ed.. ed. Los Angeles : Sage Publications, Los Angeles.
- Niemelä, J., Saarela, S.-R., Söderman, T., Kopperoinen, L., Yli-Pelkonen, V., Väre, S., Kotze, D.J., 2010. Using the ecosystem services approach for better planning and conservation of urban green spaces: a Finland case study. *Biodivers. Conserv.* 19, 3225–3243.
- Official Journal of the European Communities (OJEC) (2001). Directive 2001/42/EC of the European Parliament and the Council of the 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment. *Official Journal L197/30*, 21/07/2001.
- Office of Regional Planning of Stockholm, 2010. RUFSS 2010.
- Partidario, M.R., Gomes, R.C., 2013. Ecosystem services inclusive strategic environmental assessment. *Ecosyst. Serv. EIA SEA* 40, 36–46.
- Pauleit, S., Slinn, P., Handley, J., Lindley, S., 2003. Promoting the Natural Greenstructure of Towns and Cities: English Nature's "Accessible Natural Greenspace Standards" Model. *Built Environ.* 1978- 29, 157–170.
- Rees, W., Wackernagel, M., 1996. Urban ecological footprints: Why cities cannot be sustainable— And why they are a key to sustainability. *Manag. Urban Sustain.* 16, 223–248.
- Sandström, U.G., 2002. Green Infrastructure Planning in Urban Sweden. *Plan. Pract. Res.* 17, 373–385.
- Secretariat of the Convention on Biological Diversity, 2012. *Cities and Biodiversity Outlook*.
- Shepherd, A., Ortolano, L., 1996. Strategic environmental assessment for sustainable urban development. *Manag. Urban Sustain.* 16, 321–335.
- Short, M., Baker, M., Carter, J., Jay, S., Jones, C., 2013. *Strategic Environmental Assessment and Land Use Planning : An International Evaluation*. Routledge.
- Tratalos, J., Fuller, R.A., Warren, P.H., Davies, R.G., Gaston, K.J., 2007. Urban form, biodiversity potential and ecosystem services. *Landsc. Urban Plan.* 83, 308–317.
- Van Diepen, A., 2002. Katie Williams, Elizabeth Burton and Mike Jenks (Eds.), *Achieving Sustainable Urban Form*. *J. Hous. Built Environ.* 17, 93–95.
- Vicente, G., Partidário, M.R., 2006. SEA – Enhancing communication for better environmental decisions. *Environ. Impact Assess. Rev.* 26, 696–706.
- Wu, J., 2014. Urban ecology and sustainability: The state-of-the-science and future directions. *Landsc. Urban Plan.* 125, 209–221.