

Sustainability and Governance in Urban Forests: The Swiss Case of Neighbourwoods – SUNWoods – and its Embedding in New Ways of Analysing Urban Woodland Management

Abstract

Societies are currently facing many challenges concerning the uses and benefits of natural resources, such as land, air, water, fossil fuels, coal, animals and forests. Therefore, issues of sustainability question how the future of human-nature interrelations will be shaped. Transferring this question to urban forestry means analysing urban forestry governance systems in relation to their surrounding natural environment. As scientific methodologies have so far not been able to offer integrated methods and approaches, we introduce the concept of social-ecological regimes as a basic theoretical approach to governance research. We combine this theoretical approach with the latest findings from urban forestry governance research in order to frame the Swiss Urban Neighbourwoods project.

Introduction

How do the spatial structures of the socioeconomic, ecological and physical features of urban areas relate to one another and how do they change over time? This is one of the questions relating to the ecology of cities within the sustainability discourse (Weinstein and Turner, 2012). Specific to urban forestry, this question is: How do urban social life and green infrastructure, such as surrounding forest ecosystems, interrelate and how will they be shaped in the future?

The new paradigm of sustainability questions not only the traditional division of scientific thinking between natural or social sciences methodologies, but also breaks with the idea of nature controlling 'modern' thinking. The dependencies of governance systems on natural conditions are becoming known, but have long been neglected by the overestimation of the autonomy of societal action (Baerlocher and Burger, 2010). Both the scarcity of resources and the destruction of nature by humans have revealed the interdependencies of the social and natural spheres. Theoretical reflection on these interdependencies within the sciences is only now beginning. Inter- and trans-disciplinarity, as well as cross-sectorial disciplines, mean placing typical social phenomena alongside subject areas from the natural and technical sciences, such as environmental sociology or urban forestry. The latter is the focus of this paper.

Although ongoing attempts at scientific reflection on the relationship between society and nature can be observed, single disciplinary thinking and the Human Exemptionalism Paradigm (Catton and Dunlap, 1978) are still dominant. A systematic and theoretical concept of the society-nature relationship would lead to new perspectives.

A theoretical basis for sustainability and governance research is offered that introduces the concept of social-ecological regimes (Baerlocher, 2013). This will

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serve as a bridge to overcome this paradigmatic divide by conceptualising the interrelations between the social dimension and natural resources, resulting in a meta-framework for urban forestry governance. The level of sustainability is not the focus of our research; rather it is the 'governance of sustainability'.

In this context, a new criterion for analysing governance – the inclusion of nature as an actor – is proposed. Its theoretical embedding in the current discussion of urban forestry governance, with a special focus on the framework offered by Lawrence *et al.* (2013), will contribute to a better understanding of the mutual dependencies of the social and natural spheres within urban forest governance. This underlying framework is the starting point for the Swiss Urban Neighbourhoods (hereafter SUNWoods) project.

Only a mutual understanding of the different perspectives on the multiple benefits of forests can help to overcome existing conflict and foster participation. In order to gain knowledge for action, scientific research should investigate the complexity of social-ecological constraints. This is only possible if integrated approaches are taken to piecing together the whole.

Governance of Sustainability

Since sustainability became important on the political agenda, in particular since the idea of supporting local action in Agenda 21 processes was introduced at the Rio 1992 conference, the concept of governance has also become popular in the social sciences. Sustainability takes an integrative approach to social, economic and environmental development, which implies that any governance concept should include an integrative approach to nature and society. So far, the natural environment has mostly been regarded as a playground for social action. However, the question arises of how ecological processes influence human action. Specifically, what is the impact of climate change on social behaviour and social needs? Likewise, do different biophysical dynamics, which serve as resources, require different types of governance? Do urban forests, for example, require a specific governance regime?

The influence of nature on humans and the human impact on natural systems are generally considered

to be separate disciplines. The mutual influences of natural resources and social action, in particular their interrelations, receive little scientific investigation. Even specialised environmental governance perspectives that focus mainly on human interaction do not systematically involve nature as an actor. Understanding the interplay between social and natural dynamics offers a new perspective on how to explain governance. Authors such as Ostrom (2009) have already proposed alternatives by creating analytical frameworks for the sustainability of social-ecological systems (SES framework) (Ostrom, 2009).

This paper aims to describe and discuss which criteria should be included in the analysis of governance. We present the concept of social-ecological regimes, which systematically includes natural resources by offering a theoretical basis of human-environment interaction that is a necessity for all sustainability-related research. It is also important to offer a basis for sustainable governance analysis that will be inspiring for urban forest governance.

Governance in general refers to "theories and issues of social coordination and the nature of all patterns of rule" (Bevir, 2011), specifically "governing with and through networks" (Rhodes, 2007). This means that the role of individual action in social coordination, collective action and decision-making is more than ever the object of research and political discussion. However, it is not only societal action itself that is part of the new sustainability philosophy; human action towards nature has also been questioned and reflected on under the New Ecological Paradigm (Catton and Dunlap, 1978). A further definition proposed by Tacconi (2011) widens the perspective on governance (Lawrence *et al.*, 2013). It refers to "the formal and informal institutions, rules, mechanisms and processes of collective decision-making that enable stakeholders to influence and coordinate their independent needs and interests and their interactions with the environment at the relevant scales" (Tacconi, 2011, cited in Lawrence *et al.*, 2013). This definition combines different levels of action with the surrounding environment. Yet challenging questions remain: how do humans interact with their environment and how does individual action contribute to collective decision-making within a given context? And how does the natural environment itself influence human action?

Within sustainability research, the concept of social-ecological regimes offers a descriptive perspective

on the complex interrelations of structures and interactions. The term 'regimes' encompasses all kinds of collective societal regulations, which implies that society is always formed by regimes (Baerlocher, 2013; Baerlocher and Burger, 2010; Zierhofer *et al.*, 2008). With a twofold character, a regime on the one hand defines a framework for human activities and on the other hand is a result of human action, in that it is defined, transformed and redefined by organised actors (*ibid*). The social-ecological attribute is used because the domain in question touches upon social-biophysical interrelations (*ibid*), i.e., we can assume that societies arrange themselves in order to organise their benefits from natural resources. For example, when wood became a scarcity in nineteenth-century Switzerland, the federal Forest Police Law of 1876 was introduced to regulate the use of wood, which in turn

had an impact on the population and its social habits such as brushwood or leaf collection.

The term 'regime' is informed by Giddens' principle of the duality of structures, which argues for the mutual relation of action and structures (Giddens, 1979). Any action is always guided by social structure, and action itself produces social structures (*ibid*). Adapting this thought to the environment in the form of natural resources, the concept of social-ecological regimes theorises that social and biophysical structures influence individual action and, at the same time, action produces both social and biophysical structures (Figure 1). Therefore, structures understood as rules and as resources can enable or hinder actions and always have a structuring influence on individual action (Baerlocher, 2013).

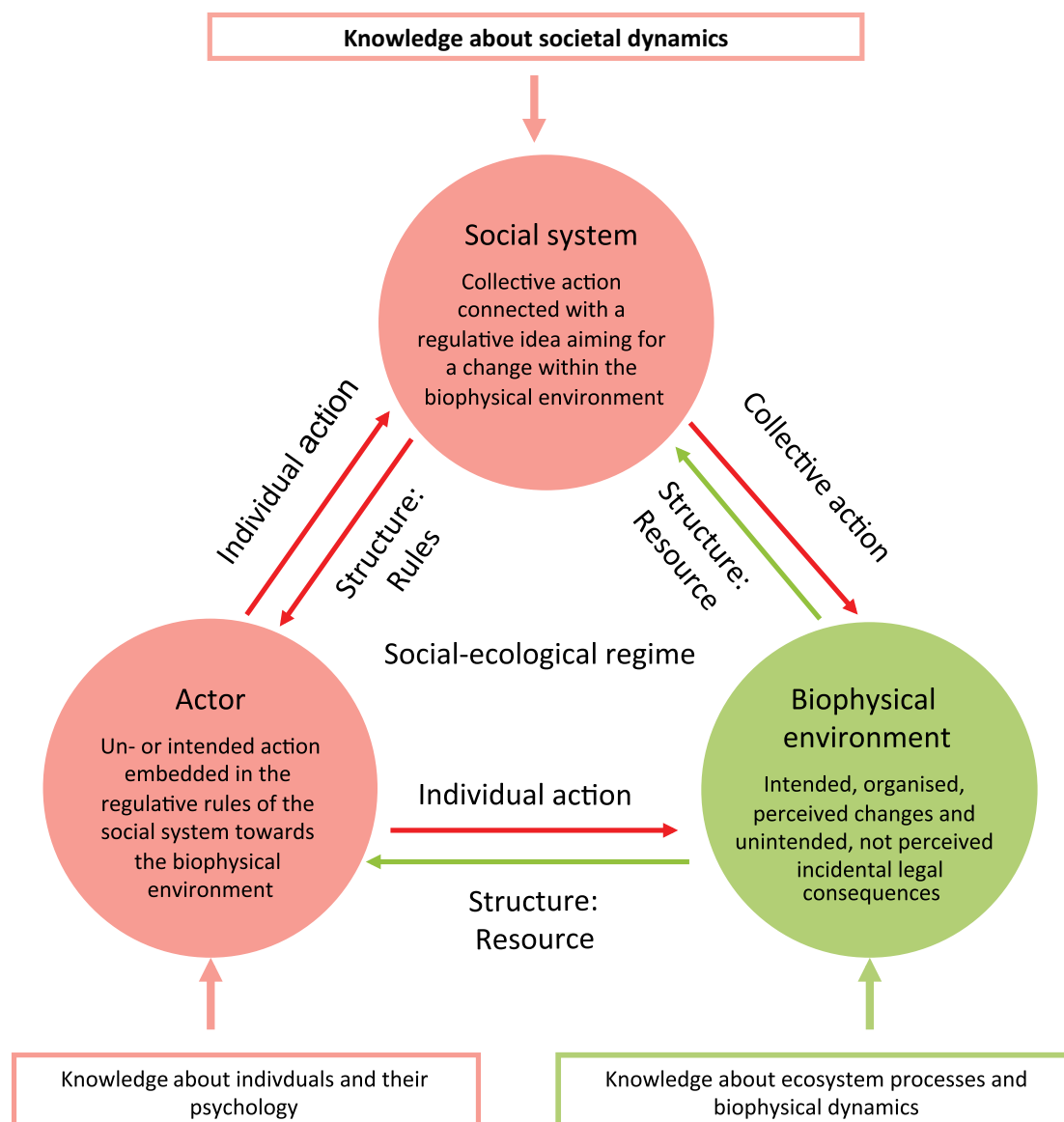


Figure 1: Social-ecological regimes (Baerlocher, 2013)

In this sense, governance can be seen as a structuration concept in which individual and collective actors are mutually influenced by societal norms and rules and by the biophysical environment in which a society aims, with its action, to gain benefits from natural resources.

The theoretical background is demonstrated using the example of a person visiting a forest as an *individual actor*. This person is not completely independent in his/her action, as he/she is embedded in a *social system (governance system)*, e.g., living in Switzerland, where people have a right of access to forests. This *rule* enables the person to act in the sense of being able to walk through the forest. Rules can also hinder action, e.g., if a sign forbids crossing a certain path. At the same time, action produces *social structures*. In this case collective action and decision-making have been taken to decide that this path should be inaccessible. By following this decision, a forester has put a sign in the forest and has automatically produced a kind of inter-objective social structure by indicating a forbidden path. People belonging to the same governance system will be able to understand this sign and will orientate their action to the given social structure. The same forester could also have produced another type of structure using natural conditions to prevent people from traversing. The forester could have felled a tree to function as an obstacle. In this case, the *resource* as a *biophysical structure* would hinder the individual from crossing. The same biophysical structure could also enable action if, for example, a biker feels tempted to jump over it. If several bikers had the same idea and even started to coordinate their habits, we could say that the felled tree also structured *collective action*. The structuring ability of nature can also be observed when children climb trees. Often old trees with many branches invite us to climb. The comparison of the effects of social and biophysical structuring can be very interesting, as they have often developed together. With these simple examples, we can assume that *knowledge* and the *regulative ideas* within the social system determine how the social-ecological regime is shaped.

Table 1 expresses, in a simplified way, the theoretical basics in categories for analysing social-ecological regimes.

Table 1: Categories for analysing social-ecological regimes

Main category	Sub category
Individual actor (user)	Condition, position, role model, behaviour
Social system (governance system)	Collective action: e.g., coordination of action, interactions, organisation, cooperation, discourses, institutions, politics, policy
	Regulative idea and its policy
Natural resources (resource system)	Type of use: ecosystem services and processes ¹
Consequences of action (outcomes)	Changes at the individual and social levels and in the biophysical system
Knowledge	Scientific findings and practical experience, transfer of knowledge

¹ Ecosystem services are ecological characteristics that directly or indirectly contribute to human wellbeing (Costanza, 2012; MEA, 2005). That means that only the benefits for people that derive from functioning ecosystems are defined as ecosystem services (Costanza, 2012; MEA, 2005), as the word 'services' seems already to indicate. In a contrary definition, ecosystem processes and functions in general include all biophysical dynamics regardless of whether humans benefit or not (Costanza, 2012; Boyd and Banzhaf, 2007; Granek et al., 2010).

These categories could easily be combined with other frameworks such as Ostrom's SES framework, which talks about users instead of actors and separates governance units and resource units from the system to which they belong (Ostrom, 2009). In the next section, these theoretical thoughts will be applied to urban forestry governance.

Urban Forest Governance

Urban forestry is constantly confronted with the urbanisation process and the demands of city dwellers (Konijnendijk, 2000). The urban forest consequently becomes an arena for social changes and activities but also for social conflicts. The more people visit their urban forest, the more potential exists for conflicts relating to spatial conditions, such as space available. Conflicts can cause local protests against tree felling (Konijnendijk, 2000). There are conflicts not only between urban inhabitants and forest authorities, but also conflicts between

user groups. The demands of urban society have therefore become part of a forester's job. As a consequence, the research field of urban forestry investigates the emerging challenges arising from urbanisation within the woodland in order to gain knowledge for action in the field and also to prevent potential conflict.

Possible methods for analysing dynamic social action regarding the use of natural resources were discussed in the previous section and will now be combined with existing methods and experiences in urban forestry specific to urban forest governance research.

In the journal *Urban Forestry and Urban Greening*, the topic of governance was addressed in less than 10% of the papers in the first eight years of its existence, which Lawrence *et al.* (2013) claim is evidence that governance has been a rarity in urban forestry research. In terms of topics, governance has been implicit in urban forestry research, but active scientific reflection on methodologies and societal action and processes regarding urban forests is lacking. Gaining knowledge for action is a new scientific endeavour, therefore reflection on forest governance systems is necessary. Like Lawrence *et al.* (2013), we argue for comparative interdisciplinary research to gain a) more information about the

modes and functioning of urban forest governance, b) an overview of existing and potential policy and delivery tools and c) understanding scales for urban forestry policy (European Commission, 2011). To address these requirements, Lawrence *et al.* (2013) developed an urban forest governance framework based on different case studies. The social categories consist of:

- Context
- Institutional framework – policies, planning and regulations, ownership, access and use rights
- Actors and coalitions – primary and other stakeholders, partnerships, power analysis
- Resources – funding, knowledge and information, delivery mechanisms
- Processes – discourses, participation, engagement and conflict management, monitoring and evaluation.

Applying this framework would enable systematic data collection within urban forestry and would also make data comparable. We believe it is worth combining these empirical criteria with the criteria from the previous section. Therefore, Table 2 shows the main categories from the social-ecological regimes concept with the main variable of the forest governance framework (marked in blue).

Table 2: Social-ecological regimes concept with the urban forestry governance framework (state of discussion)

Main category	Sub category	Urban Forestry
Context		Trees, forest, people
Individual actor (user)	Condition, position, role model, behaviour	power, ownership, mental model
Social system (governance system)	Collective action: e.g., coordination of action, interactions, cooperation, organisation, discourses, institutions, politics, policies	Primary stakeholders, other stakeholders, partnerships, power analysis, types of institutional resource regimes
	Regulative ideas and their policies	Policies, planning and regulation, ownership, access and use rights
	Resources	Funding (taxes etc.), delivery mechanisms
	Processes	Discourses, participation, engagement, conflict management, monitoring and evaluation
Natural resources (resource system)	Type of use: ecosystem services and processes	
Consequences of action (outcomes)	Changes at individual and social level and in the biophysical system	Output of planning processes, impact of results, outcome in social and natural context
Knowledge	Scientific findings and practical experiences, transfer of knowledge	Knowledge and information

Clearly, the natural resources and consequences of action categories were not part of the original forest governance framework. Nevertheless, these categories are important for tracing how decisions are made that will affect individuals, the social system and the forest itself. Only the integrated methods proposed will foster mutual understanding in practice and theory. Starting from this integrative thinking, we will now apply these combined categories to the concept of neighbourwoods.

Perspective: Swiss Urban NeighbourWoods

The Swiss Urban NeighbourWoods project developed out of the experience of the increasing and changing needs of city inhabitants towards local recreation in nature. The governance system in question concerns urban forests in Switzerland. Swiss neighbourwoods differ not only in the type of research that is being used to analyse them, but also in the communal-level political system, which differs from that of other European cities. With a direct democracy, Swiss inhabitants elect representatives and can also vote on certain policies. Decision-making can be quite independent in the communes and the 26 cantons with four different official languages. Furthermore, Switzerland is unique in its urban forests: due to a high population density in the Central Plateau, almost all forests from Geneva to Chur can be considered urban woodlands because of their proximity to urban regions. The villages and cities are growing and therefore melting with the existing (and protected) forest areas. At the same time the attitudes of the people living in these big agglomerations are often 'rural', they think of still living in the countryside rather than living in the city. Civilisation and forest wilderness are interlinked.

Before describing the SUNWoods project in more detail, it is necessary to explain what neighbourwoods are.

Neighbourwoods can be described as 'close to home' woodlands or 'woods on people's doorstep' that are both accessible for public use and integrate public interest in planning and decision-making (Forest Service, 2012; Konijnendijk and Schipperijn, 2004). Although there are neighbourwood activities all over the world, for example in Ireland and the USA, the neighbourwoods concept introduced here and understood as an analytical tool mainly refers to the neighbourwoods project 'Advancing the Quality of

Life and the Environment of European Cities through Socially Inclusive Planning, Design and Management of Urban Woodlands' (Janse and Konijnendijk, 2007). The goal of the project (2001 to 2004) was to analyse the factors that influence participation processes concerning urban woodlands by testing different tools for stakeholder management (ibid: 24).

The concept of neighbourwoods is a useful tool to better describe the mutual relations of city dwellers and their urban forest. In addition to the understanding of neighbourwoods as 'close to home woods', we emphasise several criteria that are important for the basic understanding of neighbourwoods.

- Within this mutual relationship, the benefits of neighbourwoods with regard to social services in forest and ecosystem processes within cities need to be analysed and communicated.
- Understanding neighbourwoods requires the integration of aspects of sustainable governance to better distinguish the conditions under which environmental decision-making can be optimised for the planning of urban forests.
- Participation processes and conflict management are integral to neighbourwoods and their planning.

The SUNWoods project started in April 2013 and will last until March 2015. We have defined various steps to make a case study. Table 3 provides an overview of the levels of engagement with the cities involved.

In the pilot phase of the project, we established a case study in the Swiss town of Baden that has so far progressed through levels I-IV (Table 3). After two interviews with the head of Baden's forestry department (level II), we had the opportunity to conduct oral questionnaires with about 50 participants of the 'Environment Weeks' in Baden. The questions concerned the satisfaction of the inhabitants with their urban forest, visible conflict and people's willingness to actively engage with their urban forest. When we reached level IV of our involvement with the town, we organised a working group within the town council's four administrative departments in order to identify funding possibilities and to discuss possible means of encouraging people to actively engage with their urban forest. 'Urban Forest and Art' was defined as the first SUNWoods case. Further steps towards workshops combined with crowd-funding ideas are currently being planned.

Table 3: Levels of engagement in the SUNWoods participatory process

Level	Explanation	Products
I	Rough characterisation of the case on the basis of written documents (without personal contact).	List of references; short overview with main characteristics and problem orientation of the case.
II	Basic description of the case based on the simple application of the meta-framework combined with one selected first interview.	List of references; description of the case based on the analytical meta-framework; interview assessment.
III	Basic description of the case based on the simple application of the meta-framework combined with several interviews concerning different perspectives.	List of references; description of the case based on the analytical meta-framework; interview assessment; first stakeholder approach; special reports.
IV	Detailed description of the case and approaching of detailed aspects with stakeholders (starting point of the participatory process).	List of references; detailed description of the case based on the analytical meta-framework; various outputs.
V	Detailed description of the case and approaching of detailed aspects with stakeholders by finishing the process.	List of references; detailed description of the case based on the analytical meta-framework; various outputs.

As the framework itself was only developed during the pilot phase and is based on this experience, we can only provide initial insights into the first case study of the town of Baden. We need to apply the categories to other cases as well. Feedback into empirical research and comparison with other cases will, with time, test the framework.

Although the SUNWoods project has only recently started and has a limited timespan, we are convinced that the theoretical work will help to understand the dynamics of urban forestry governance in Switzerland. In addition to initiating a first case study, we have received funding for a second project that is linked to SUNWoods, namely, an investigation of gender and diversity within urban forestry governance. Analysing processes of participation and the exclusion of different groups will contribute greatly to the SUNWoods research. In the long term, our vision is to establish innovative partnerships and groups that will be enabled to exchange ideas beyond economically driven discourses by considering different perspectives on urban forest governance. Moreover, the results of this study will nourish future discussion on social-ecological regimes and their implications for sustainable governance.

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