Compendium Forested Landscapes

Analysis & Governance

Contents

Introduction

The international Forest & Landscape program, taught at SLU at Bachelor level, began in 2021. In its essence, the program tries to combine the very best from forestry and landscape management. This unique program gives in-depth knowledge of forests and landscapes, taking a holistic approach to trees and forests and their importance to society, by focusing on the different perspectives of the forested landscapes and the management of them. Students are expected to gain adequate knowledge to work as e.g. a specialist or advisor at governmental authorities, municipalities, forestry companies, NGOs or in nature communication.

In developing the program, we as educators have developed new courses, and in doing so we have discussed and carefully selected the specific frameworks, theories and models to be presented and discussed during the program. It has been a challenge to make this selection, and not at least to select the best possible literature to support our teaching. Many terms and concepts are under constant debate within the academics, but certainly also in practice. And some have a long history, while others are brand new. But will the newer concepts sustain, and what do they bring to the future professions as forest and landscape managers?

Before we start, it is critical to distinguish between frameworks, theories, and models, as these concepts are frequently used as the foundation of academic discourse and practice. Frameworks organize key elements and their relationships, setting the stage for deeper analysis. Theories provide assumptions to analyze and predict phenomena, building on the structure offered by frameworks. Models, in contrast, use specific assumptions from theories to predict outcomes, often simplifying complex processes for practical application (Ostrom, 2011).

This compendium includes brief texts which introduces theories, concepts, models and frameworks of relevance for analyzing, understanding and applying governance and management as an approach to tackle the many contemporary societal challenges, in a long-sighted and sustainable manner. Each term is briefly described, as we present and use them in the courses, and each term is associated with key references, carefully selected for further reading to support students in further understanding the terms. Thus, the compendium is far from complete, and the descriptions we provide are far from exhaustive. We believe and hope that our brief descriptions will inspire and guide you to further literature to support your studies.

The compendium relates specifically to the two courses Analysis of Forested Landscapes (LK0394), and Forest & Landscape Governance (LK0434). We hope that the compendium will be used in other courses as well, and we envision that other courses will add their most relevant terms, concepts and principles to this compendium in the future. We do realize that a selection of descriptions and references to key text needs to be updated on a regular basis. Therefore, we consider this compendium as an initial version that will evolve over time.

Our approach

During 2023, the editors of the compendium held a number of workshops to discuss and create a baseline list of terms, concepts and principles already presented in the courses. From there, we defined categories of terms and related search strings to be used in Scopus. Three overall categories were created and within these, seven different search groups occurred, each with a specific search string, hence a total of twenty-one search strings.

Searches were limited to 10 years, spanning 2014-2023. The articles were sorted by relevance, and the first 10 articles in each search string were reviewed by the editors to identify and discuss the latest research within the fields of forest and landscape governance and management. In addition to the searches for contemporary literature, we have added our own knowledge and experience to identify papers, and not least textbooks, which we felt have been central in defining the included terms, concepts and principles.

References

Ostrom, E. (2011). Background on the institutional analysis and development framework. *Policy Studies Journal, 39*(1), 7–27. https://doi.org/10.1111/j.1541-0072.2010.00394.x

1. Analysis of Forested Landscapes

1.1. Definition of a Forested Landscape

The term 'Landscape' refers to physical spaces from which a social group can derive a shared identity and meaning, (Gieseking et al., 2014). It can be defined as the interaction of people and a place, or a social group and its spaces. It is important to understand the interplay between landscapes and identities, and as such Roca et al., (2011) advocated for the landscape perspective as an essential component for sustainable development in a globalized world.

A 'Landscape' is defined by the European Landscape Convention (ELC) as "'… *areas, as perceived by people, which character is the result of the action and interaction of natural and/or human factors*" (Council of Europe, 2000). Further, the ELC defines a Landscape as "*an environment that has been modified, cultivated, enhanced or exploited through human activity*".

A forested landscape represent a dynamic blend of elements, such as trees, vegetation and humans, encompassing the people inhabiting areas across various settings from densely populated cities to more forested environments.

Key literature:

- Council of Europe. (2000). *Landscape Convention*. European Treaty Series No. 176. https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=176
- Roca, Z., Claval, P., & Agnew, J. (Eds.). (2011). *Landscapes, identities and development* (1st ed.). Routledge.
- Gieseking, J. J., et al. (Eds.). (2014). *The people, place, and space reader*. Routledge. https://doi.org/10.4324/9781315816852

1.2. Landscape dynamics

Forested landscapes develop, adapt and respond to influences such as climate change, urbanization, and human activities such as recreation and management. Studying these dynamics is crucial for understanding how to sustain and enhance the health, resilience, and functionality of forests and landscape, being rural or urban.

Understanding a landscape locally or regionally will be strengthened by multiple units of analysis, thus providing a better understanding of the spatiotemporal dynamics (Borelli et al., 2023). However, landscape dynamics also relate to the governance and management of formal institutions, mostly forest owners, or in urban areas, mostly local governments. However, also informal institutions and organizations closely tied to the landscape play a significant role in shaping landscape processes and claims. Landscape dynamics are closely related to the characteristics of the stakeholder's internal operations such as budgets, personnel, and strategic policies (Randrup et al., 2023).

Key literature:

- Borelli, S., Conigliaro, M., & Di Cagno, F. (2023). *Urban forests: A global perspective*. FAO. https://doi.org/10.4060/cc8216en

- Gustavsson, R. (2004). Exploring woodland design: Designing with complexity and dynamics—woodland types, their dynamic architecture and establishment. In *The dynamic landscape* (pp. 246–293). Taylor & Francis. https://res.slu.se/id/publ/6700
- Randrup, T. B., et al. (2023). Planning, designing and managing green infrastructure and urban forests for biocities – Introducing a strategic and adaptive management approach. In Scarascia-Mugnozza & Boeri (Eds.), *Transforming biocities* (pp. 85–107). European Forest Institute (EFI). http://dx.doi.org/10.1007/978-3-031-29466-2_4

1.3. Landscape Multifunctionality

Forested landscapes and landscapes in general, fulfill multiple functions and provide various benefits simultaneously. This is referred to as multifunctionality. The expectation of multifunctionality has been accelerated as a number of decisive societal challenges have arisen. These include, but are far from limited to, climate change, urbanization, and biodiversity loss. Multiple functions within an area may include both a production perspective, but also a recreational and a stormwater retention perspective. The many functions of a space can be expressed as the many values forested landscapes – or nature – give to humans. This has been denoted as Ecosystem Services (Millennium Ecosystem Assessment, 2005).

The concept of 'multifunction' is widely used in urban planning to integrate and develop multiple functions within the same area. This idea is often explored in the context of green infrastructure, focusing on the combination of ecological and social functions. Time-based multifunctionality involves using the same space for different purposes at different times, while spatial multifunctionality can be achieved through three spatial arrangements: i) Tessellated multifunction: separating functions within an area, ii) Partial multifunction: combining different functions where one is dominant, and iii) Total multifunction: balancing multiple functions within the same space (Sundevall & Jansson, 2020).

As forested landscapes often have multiple functions, the related governance and management of forested landscapes require multiple expertise, insights and competences. This is often referred to as inter-disciplinary, in which the practices and assumptions of each discipline involved are blended (Seel, 2012).

Key literature

- Millennium Ecosystem Assessment. (2005). *Ecosystems and human well-being: Synthesis*. Island Press. https://www.millenniumassessment.org/documents/document.356.aspx.pdf
- Seel, N. M. (Ed.). (2012). Cross-disciplinary learning. In *Encyclopedia of the sciences of learning*. Springer. https://doi.org/10.1007/978-1-4419-1428-6_1476
- Sundevall, E. P., & Jansson, M. (2020). Inclusive parks across ages: Multifunction and urban open space management for children, adolescents, and the elderly. *International Journal of Environmental Research and Public Health, 17*(24), 9357. https://doi.org/10.3390/ijerph17249357

1.4. Landscape Analysis

The analysis of (forested) landscapes is a multidisciplinary effort that combines spatial, ecological, social, economic, and cultural aspects. Hence, Landscape analysis is overarching for other types of analysis. The

aim of conducting such an analysis is to understand, assess, and make informed decisions about the planning, management, and overall sustainability of the landscape (Antrop, 2000).

'Traditional' landscape analysis includes the analysis of natural factors and biophysical attributes. Natural factors encompass climate, geology, hydrology, and ecology, shaping landscapes. Biophysical attributes include terrain, elevation, soil types, wetlands, vegetation, infrastructure, and more in a landscape. However, landscape analysis also includes the analysis of social, cultural and historical aspects in relation to how the landscape has been developed, managed and maintained (Stahlschmidt et al., 2017).

Key literature:

- Stahlschmidt, P., et al. (2017). *Landscape analysis: Investigating the potentials of space and place*. Routledge. https://doi.org/10.4324/9781315682792
- Antrop, M. (2000). Background concepts for integrated landscape analysis. *Agriculture, Ecosystems & Environment, 77*(1-2), 17–28. https://doi.org/10.1016/S0167-8809(99)00089-4

1.4.1. Historical Landscape Analysis

Historical Landscape Analysis involves the study of past landscapes to trace their evolution and development over time. It integrates different sources such as archival records, maps, archaeological evidence, and others in order to reconstruct the historical patterns of land uses and settlement, cultural practices, and environmental changes that shaped the landscapes (Stahlschmidt et al., 2017). The application of historical landscape analysis aims to show the cultural, social, economic, and environmental factors that contributed to the transformation of the landscape. Historical Landscape analysis can also provide valuable insights for heritage conservation, landscape management, and planning.

Key literature:

- Antrop, M. (2000). Background concepts for integrated landscape analysis. *Agriculture, Ecosystems & Environment, 77*(1–2), 17–28. https://doi.org/10.1016/S0167-8809(99)00089-4
- Stahlschmidt, P., et al. (2017). *Landscape analysis: Investigating the potentials of space and place*. Routledge. https://doi.org/10.4324/9781315682792

1.4.2. Landscape Character Assessment

Landscape Character Assessment is a method of analysis that helps understand and evaluate the different qualities and characteristics of a landscape. It integrates the analysis of natural, cultural, and perceived aspects of a landscape, including its landforms, vegetation, historic features, land use patterns, and visual elements, with the aim of identifying the unique qualities and values of the landscape. The Landscape Character Assessment is primarily used as a tool for analyzing different types of landscape change processes (e.g. planned interventions) and their potential effect on character.

Key literature:

- Butler, A., & Herlin, I. S. (2021). Landscape character assessment and participatory approaches. In *The Routledge handbook of landscape ecology* (pp. 335–351). Routledge.

https://www.taylorfrancis.com/chapters/edit/10.4324/9780429399480-20/landscape-character-assessment-participatory-approaches-andrew-butler-ingrid-sarl%C3%B6v-herlin

- Stahlschmidt, P., et al. (2017). *Landscape analysis: Investigating the potentials of space and place*. Routledge. https://doi.org/10.4324/9781315682792
- Swanwick, C. (2002). *Landscape character assessment: Guidance for England and Scotland: Prepared for the Countryside Agency and Scottish Natural Heritage by Carys Swanwick*. Countryside Agency.

1.4.3. Land Use Analysis

Land Use Analysis is the systematic study and evaluation of how land is utilized and allocated for various purposes within a given area or region. It involves identifying and mapping different land uses, such as residential, commercial, industrial, agricultural, recreational, and conservation areas, as well as analyzing the spatial patterns, distribution, intensity, and dynamics of land use activities over time (Stahlschmidt et al 2017). Land use analysis helps to assess the sustainability of land use practices, and to understand the implications of land use changes on environmental, social, and economic factors.

 Key literature:

- Antrop, M. (2000). Background concepts for integrated landscape analysis. *Agriculture, Ecosystems & Environment, 77*(1-2), 17–28. https://doi.org/10.1016/S0167-8809(99)00089-4
- Stahlschmidt, P., et al. (2017). *Landscape analysis: Investigating the potentials of space and place*. Routledge. https://doi.org/10.4324/9781315682792

1.4.4. Spatial mental mapping

The purpose of spatial mental mapping is to highlight those elements and features that enable people to navigate their way through a space. It is powerful because it is useful on multiple scales (Stahlschmidt et al. 2017). The method developed by Kevin Lynch (1964) in a city context uses five symbols to characterize the spatial pattern of a landscape: Paths, edges, districts, nodes and landmarks.

Key literature:

- Lynch, K. (1964). *The image of the city*. MIT Press.
- Stahlschmidt, P., et al. (2017). *Landscape analysis: Investigating the potentials of space and place*. Routledge. https://doi.org/10.4324/9781315682792

1.4.5. The Urban Matrix

The term Urban Matrix was presented by Müller et al., (2010) as a starting point when presenting and defining the relationships between ecological processes and the urban landscape. Haase et al., (2020) redefined the term to describe the overall landscape matrix, consisting of patches and corridors, with reference to Forman (1995). The Urban Matrix is an important foundation for understanding the composition and the complexity of a city as a human-dominated habitat. Haase et al., (2020) describe four overall types of the Urban Matrix, being Green, Blue, Grey and Brown spaces, and they discuss how these interlink.

Key literature:

- Forman, R. T. T. (1995). *Land mosaics: The ecology of landscapes and regions*. Cambridge University Press. https://books.google.com/books/about/Land_Mosaics.html?id=sSRNU_5P5nwC
- Haase, D., et al. (2020). Urban open spaces and the urban matrix: Elements, form and functions. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 30–50). Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf
- Müller, N., Werner, P., & Kelcey, J. (2010). *Urban biodiversity and design*. Wiley-Blackwell. https://doi.org/10.1002/9781444318654

1.5. Landscape Ecology

Landscape ecology can be described as the study of interactions across space and time between the structure and function of physical, biological and cultural components of landscapes (Francis et al., 2016). Landscape ecology, since its inception in the 1980s, has significantly influenced how scientists and environmental managers perceive the environment, particularly in relation to spatial patterns and ecological processes (Turner & Gardner, 2015). The study of ecology concerns habitat fragmentation, and the concept of landscape ecology often refers to that of patches and the corridors connecting these. Landscapes as ecological units with individual structures and functions are composed primarily of patches in a matrix. These patches differ fundamentally in origin and dynamics, while size, shape and spatial configuration are also important (Forman & Godron, 1981).

Key literature:

- Forman, R. T. T., & Godron, M. (1981). Patches and structural components for a landscape ecology. *BioScience, 31*(10), 733–740. https://doi.org/10.2307/1308780
- Francis, R. A., Millington, J. D. A., & Chadwick, M. A. (2016). *Urban landscape ecology: Science, policy and practice*. Routledge. https://doi.org/10.4324/9781315713373
- Turner, M. G., & Gardner, R. H. (2015). Introduction to landscape ecology and scale. In *Landscape ecology in theory and practice* (pp. 1–14). Springer. https://doi.org/10.1007/978-1-4939-2794-4_1

2. Social Characteristics of Forested Landscapes

2.1. Landscape Actors: Stakeholders and users.

Forested landscapes are significantly shaped by human activities, with a diverse array of actors that hold different interests and relations to the landscape. Actors' relations to a specific landscape depend on the historical, social, and political constitution of the powers of each actor, which may be based on ideology, wealth, heredity, election, appointment or other means. Actors may also be differentiated from each other by their beliefs and objectives, the internal structure of their organization, membership, funding sources and the laws to which they are subject (Agrawal & Ribot, 1999). Landscape actors are, sometimes, denoted as stakeholders or users. The two terms are closely related but hold slightly different meanings.

Stakeholders are defined as those individuals, groups, or organizations that have a vested interest or concern in a certain issue, area or theme (Reed et al., 2009). A forest and landscape stakeholder will usually have a specific interest, e.g. being affected by activities and regulations in the management, development, preservation, or use of a specific forest or landscape (Bryson, 2004). The different stakeholder's interests influence the landscapes' character and functioning. These interests often include the ecological, social, cultural, economic or recreational aspects of a particular forest or landscape. Landscape stakeholders may include, but are not limited to, local governments, residents' associations, care and utility companies, property owners, recreational groups and conservationists (Persson et al., 2020).

Users are defined as a specific subset of the public, including individuals or groups regularly or potentially interacting with a particular space (Fors et al., 2020). Users are categorized into 'communities of location' (geographically linked groups) and 'communities of interest' (groups connected by shared interests) (Seyfang & Smith, 2007; Fors et al., 2020). While there are overlaps with the term "stakeholders," being a user does not automatically make someone a stakeholder or vice versa; this only occurs when users have a specific stake in the landscape.

In urban open spaces in a Global North context, different user groups have been described (Jansson et al., 2020), among which there are groups that may need specific attention, sometimes called marginalised or vulnerable groups, such as: young children and their families, children in schools and preschools, the elderly and people in need of care, people with disabilities and ethnic minorities and immigrants.

Key literature:

- Agrawal, A., & Ribot, J. (1999). Accountability in decentralization: A framework with South Asian and West African cases. *The Journal of Developing Areas, 33*(4), 473–502. https://www.files.ethz.ch/isn/30001/2000-01.pdf
- Bryson, J. (2004). What to do when stakeholders matter. *Public Management Review, 6*(1), 21–53. https://doi.org/10.1080/14719030410001675722
- Fors, H., et al. (2020). Participation in urban open space governance and management. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 112–128). Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf
- Jansson, M., et al. (2020). User-oriented urban open space governance and management. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 68–92).

Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf

- Persson, Å., et al. (2020). Organisations related to urban open spaces. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management*. Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf
- Reed, M. S., et al. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management, 90*(5), 1933–1949. https://doi.org/10.1016/j.jenvman.2009.01.001

2.2. Uses of Forested Landscapes

Forested landscapes are important in supporting various user groups. Uses of forested landscapes shift over time and contexts, as related to various users and roles.

In urban forested landscapes, uses can be categorized in several ways, e.g. as: *extrinsic* (dog walking, foraging, play), *social* (meeting friends, picnics, festivities), *active* (running, ball games, skateboarding, qi gong), *intrinsic* (nature experience, mental recreation, sunbathing) and *non-use* (passing through, not using) (Fongar et al., 2019). Users' preferences may differ and disturb each other, (Jansson et al., 2020). Therefore, governance and management activities must address or avoid conflicts in use. Many user groups (see also under Landscape Actors) wish to affect, explore and co-create the environment via engagement or involvement processes (see under Participation, Engagement and Inclusion).

In forested landscapes that are predominantly rural, users might depend on the landscape for survival, e.g., when it is part of their livelihoods, including stakeholders such as indigenous peoples and local communities (IPLC) who may engage in sustainable harvesting practices, gathering forest products for economic and cultural purposes, and establishing a direct link between their livelihoods and the landscape (e.g. Dooley et al., 2018).

Key literature:

- Dooley, K., et al. (2018). *Missing pathways to 1.5°C: The role of the land sector in ambitious climate action*. Climate Land Ambition and Rights Alliance. https://climatelandambitionrightsalliance.org/report
- Fongar, C., et al. (2019). Does perceived green space quality matter? Linking Norwegian adult perspectives on perceived quality to motivation and frequency of visits. *International Journal of Environmental Research and Public Health, 16*(2327). https://doi.org/10.3390/ijerph16132327
- Jansson, M., et al. (2020). User-oriented urban open space governance and management. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 68–92). Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf
- Rutt, R. L., & Gulsrud, N. M. (2016). Green justice in the city: A new agenda for urban green space research in Europe. *Urban Forestry & Urban Greening, 19*, 123–127. https://doi.org/10.1016/j.ufug.2016.07.004

2.3. User Perceptions and Values

Forest and landscape perceptions and values refer to how individuals and communities view and attach significance to the natural and built environments around them (Zube, 1987). Perceptions and values are key to understanding people's relationships with the landscapes they inhabit and can influence decision-making processes related to forest and landscape management and governance.

With forest and landscape perceptions, we refer to how people see and interpret their surroundings through their sensory experiences, cognitive understanding, and emotional responses (Chhetri & Chhetri, 2022). Perceptions vary widely among individuals and communities and are influenced by cultural, social, historical, and personal factors (Hedblom et al., 2020).

Forest and landscape values relate to the importance attributed to a certain feature of a particular landscape. The degree to which something is valued depends on the individual's desire or need for it. The stronger the desire or the greater the need, the higher the value that person places on it (Zube, 1987). Different types of values related to Forested Landscapes can include i) economic value, related to the potential for agriculture, tourism, or real estate development, ii) aesthetic value, which refers to the beauty or sensory appeal of a landscape; iii) ecological value related to the biodiversity and ecosystem services a landscape provide; iv) cultural value, which encompasses the historical or symbolic significance of a place to a particular group; and v) spiritual value, which involves the connection people feel to a landscape on a deeper, often spiritual or emotional level.

Rutt and Gulsrud (2016) call the attention to equity and justice in access to and usefulness of urban green spaces (UGS), describing how research primarily focuses on functional values and managerial aspects of UGS, while paying less attention to equity in the enjoyment of and decision-making around UGS. Marginalised groups and cultural or ethnic minorities often have needs different from that of other segments, but are rarely included or even considered in UGS planning and management.

Key literature:

- Chhetri, P., & Chhetri, A. (2022). Theoretical perspectives on landscape perception. In R. S. Singh, B. Dahiya, A. K. Singh, & P. C. Poudel (Eds.), *Practising cultural geographies. Advances in 21st century human settlements* (pp. 1–20). Springer. https://doi.org/10.1007/978-981-16-6415-1_4
- Hedblom, M., Hedenås, H., Blicharska, M., Adler, S., Knez, I., Mikusiński, G., … & Wardle, D. A. (2020). Landscape perception: Linking physical monitoring data to perceived landscape properties. *Landscape Research, 45*(2), 179–192. https://doi.org/10.1080/01426397.2019.1611751
- Zube, E. H. (1987). Perceived land use patterns and landscape values. *Landscape Ecology, 1*, 37–45. https://doi.org/10.1007/BF02275264

2.4. Participation, Engagement and Inclusion.

There is an increasing demand of decentralisation and citizen-oriented governance approaches in the management and governance of landscapes (Jansson et al., 2020). It is broadly recognised that one-way elite-led communication fail to allow for public dialogue and engagement, which is needed to generate new ideas, provide challenge and offer alternative solutions to wicked problems, such as climate change mitigation and adaptation, halting the decline of biodiversity and promote environmental justice. A wave

of local participation and engagement efforts have been launched to include the visions of various stakeholders to co-create, co-design and co-maintain landscapes, also to foster the sense of ownership and pride in project and management outcomes.

However, only securing participation might not be enough, as participatory processes may only have symbolic or ritual results (Arnstein, 1969). The benefits of participation are based on the intentions and willingness to relocate power from local institutions and officials to the citizens. Arnsteins participation ladder (and later developments of the same) helps organisers, local leaders, and facilitators to grasp and advocate for higher powers being transferred towards stakeholders, including vulnerable groups. The tool shows the different levels of stakeholder participation as in a spectrum that goes from "informing" to "collaborating" and arrives at "devolving". It thus outlines a progression of steps that individuals or groups can take to increase the level of participation in their organization or community. It can be also used in a direct conversation with the stakeholders to understand their needs. The participation ladder allows a steady rise in the participation of the citizens or the community into the project, up to a complete control over it. It can be used to assess the level of stakeholder involvement, which however not always needs to step up the ladder. Stakeholders can participate differently in different stages of a project cycle (Fors et al., 2021).

The extent of involvement and the transfer of power to stakeholders, e.g. from local governments, can be challenging (Fors et al., 2020). Despite political support for including marginalized groups in forest landscape management, they are often excluded and face barriers to participation, hence they tend to be underrepresented in decision-making processes, and lack the necessary resources to assert their rights (O'Brien et al., 2011; Rutt and Gulsrud, 2016). Participatory processes can thus lead to unjust exercises of power that may not be intentional but still happen to reinforce existing inequalities rather than diminishing them

Key literature:

- Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners, 35*(4), 216–224. https://doi.org/10.1080/01944366908977225
- Fors, H., Ambrose-Oji, B., Van den Bosch, C. K., Mellqvist, H., & Jansson, M. (2020). Participation in urban open space governance and management. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 112–128). Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf
- Fors, H., Hagemann, F., Sang, Å. O., & Randrup, T. B. (2021). Striving for inclusion – A systematic review of long-term participation in strategic management of urban green spaces. *Frontiers in Sustainable Cities, 3*, 572423. https://doi.org/10.3389/frsc.2021.572423
- Jansson, M., Vogel, N., Fors, H., Dempsey, N., Buijs, A., & Randrup, T. B. (2020). Defining urban open space governance and management. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 11–29). Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf
- O'Brien, L. E., Urbanek, R. E., & Gregory, J. D. (2022). Ecological functions and human benefits of urban forests. *Urban Forestry & Urban Greening, 75*, 127707. https://doi.org/10.1016/j.ufug.2022.127707

- Rutt, R. L., & Gulsrud, N. M. (2016). Green justice in the city: A new agenda for urban green space research in Europe. *Urban Forestry & Urban Greening, 19*, 123–127. https://doi.org/10.1016/j.ufug.2016.07.004

2.5. Stakeholder Analysis

Stakeholder analysis is a structured process aimed at identifying, evaluating, and prioritizing the individuals, groups, or organizations that hold a vested interest in or are impacted by the decisions taken around a specific Landscape. Within stakeholder analysis, three overarching themes are commonly recognized in the literature (Bryson, 2004; Reed et al., 2009; Ackermann & Eden, 2011): i*) Stakeholder identification*, entails recognizing the broad spectrum of actors and organizations that may influence or be influenced by any intervention on the Landscape. Accurately identifying stakeholders and understanding their respective claims is essential for ensuring the success and sustainability of landscape-related initiatives; ii) *Understanding stakeholder dynamics*, involves examining both the power and interests of stakeholders. This includes analyzing stakeholder relationships, responses to organizational actions, and interactions among stakeholders. By understanding these dynamics, organizations can develop tailored strategies and actions to address the needs and concerns of specific stakeholders effectively; and iv) *Integrating stakeholder analysis with landscape goals*, includes the alignment of stakeholder analysis with the overarching objectives of the Landscape management or intervention. It prioritizes the identification and engagement of stakeholders that are most relevant to achieving landscape management goals.

Key literature:

- Ackermann, F., & Eden, C. (2011). Strategic management of stakeholders: Theory and practice. *Long Range Planning, 44*(3), 179–196. https://doi.org/10.1016/j.lrp.2010.08.001
- Bryson, J. (2004). What to do when stakeholders matter. *Public Management Review, 6*(1), 21–53. https://doi.org/10.1080/14719030410001675722
- Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., ... & Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management, 90*(5), 1933–1949. https://doi.org/10.1016/j.jenvman.2009.01.001

3. Management of Forested Landscapes

Urban landscape management is a multifaceted process involving various stakeholders, components, and interactions that influence one another (Jansson & Lindgren, 2012). Within a landscape context, management is defined in various ways. The European Landscape Convention (ELC) describes it as an "*action, from a perspective of sustainable development, to ensure the regular upkeep of a landscape, so as to guide and harmonize changes which are brought about by social, economic and environmental processes*" (Council of Europe, 2000, p. 2). Thus, the ELC focuses on upkeep, but also on striving for sustainability (social, economic and environmental). This directs the attention to action, complexity and changes over time. However, 'regular upkeep' can be questioned, as it implies a focus on operations (maintenance) rather than on management in broad or strategic terms.

Key literature

- Council of Europe. (2000). *Landscape Convention*. European Treaty Series No. 176. https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=176
- Jansson, M., & Lindgren, T. (2012). A review of the concept 'management' in relation to urban landscapes and green spaces: Towards a holistic understanding. *Urban Forestry & Urban Greening, 11*(2), 139–145. https://doi.org/10.1016/j.ufug.2012.01.004

3.1. Urban Green Space Management

Management of urban green spaces involves both the long-sighted planning and the operational maintenance and up-keep of these spaces in or near urban agglomerations, and it is defined as "*A strategic, inclusive and long-sighted approach of continued re-planning, re-design, re-construction and maintenance of urban open spaces*" (Jansson et al., 2020).

Moreover, urban green space management (or place-keeping) can be defined as a process of both management and maintenance (as described above), both carried out by an organization, owning or formally managing the area for the benefit of users (Jansson & Lindgren, 2012; Dempsey & Burton, 2012). This definition points to a three-dimensional system composed of the green space itself, the management organization, and the users (Randrup & Persson, 2009), and thus relates to ecological, economic, and social aspects of sustainability.

There are several texts related to urban forestry and/ or urban green space management (see Key literature list). Focus may be slightly different, depending on the landscape element analyzed, e.g. trees versus parks, but overall the definition and challenges remain the same.

Key literature:

- Council of Europe. (2000). *Landscape Convention*. European Treaty Series No. 176. https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=176
- Dempsey, N., & Burton, M. (2012). Defining place-keeping: The long-term management of public spaces. *Urban Forestry & Urban Greening, 11*(1), 11–20. https://doi.org/10.1016/j.ufug.2011.09.005
- Jansson, M., & Lindgren, T. (2012). A review of the concept 'management' in relation to urban landscapes and green spaces: Towards a holistic understanding. *Urban Forestry & Urban Greening, 11*(2), 139–145. https://doi.org/10.1016/j.ufug.2012.01.004

- Jansson, M., Vogel, N., Fors, H., Dempsey, N., Buijs, A., & Randrup, T. B. (2020). Defining urban open space governance and management. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 11–29). Routledge. https://www.perlego.com/book/1506582/urban-open-space-governance-and-management-pdf
- Randrup, T. B., & Persson, B. (2009). Public green space in the Nordic countries – Development of a new strategic green space management regime. *Urban Forestry & Urban Greening, 8*(1), 31–40. https://doi.org/10.1016/j.ufug.2008.08.004

3.2. Strategic Management

Strategic management embraces a holistic and long-term perspective in the development of forested landscapes, be it green infrastructure, an urban forest or other green-blue spaces. The concept acknowledges that once a space is planned, designed and constructed, it may continue to develop over centuries (Randrup & Persson, 2009). This includes changes in local demographics and social needs, in relation to available resources, as well as to global challenges such as climate change and urbanization (Randrup et al. 2023). Therefore, continuous maintenance is required, but also adaptation to a changing context. Thus, whilst maintaining in the short term, there is also a constant need for re-planning, re-designing, and re-construction. Hence planning, designing, construction and maintenance are realised as a long-term cyclic process.

Strategic management breaks the traditional logic of planning, designing, construction and maintenance by exemplifying a non-linear process where decisions and adaptation in relation to changed user patterns, demography, climate, etc. may occur at any point. The progressive and long-term process of strategic management thus needs to be adaptive in order to be relevant for future implementation into planning and management (Randrup et al., 2023).

Key literature:

- Jansson, M., Vogel, N., Fors, H., & Randrup, T. B. (2019). The governance of landscape management: New approaches to urban space development. *Landscape Research, 44*(8), 952–965. https://doi.org/10.1080/01426397.2018.1536199
- Randrup, T. B., Jansson, M., Sjöman, J. D., et al. (2023). Planning, designing and managing green infrastructure and urban forests for biocities – Introducing a strategic and adaptive management approach. In Scarascia-Mugnozza & Boeri (Eds.), *Transforming biocities* (pp. 85–107). European Forest Institute (EFI). http://dx.doi.org/10.1007/978-3-031-29466-2_4
- Randrup, T. B., & Persson, B. (2009). Public green space in the Nordic countries – Development of a new strategic green space management regime. *Urban Forestry & Urban Greening, 8*(1), 31–40. https://doi.org/10.1016/j.ufug.2008.08.004

3.3. Adaptive Management

Adaptive management as a concept has a long history and stems from the forestry profession, as a means to transfer and implement policy decisions into management. FEMAT (1993) described (forest ecosystem) adaptive management as '[the] *process of implementing policy decisions as scientifically driven management experiments that test predictions and assumptions in management plans and using the*

resulting information to improve the plans' (FEMAT, 1993). Later, adaptive management has been described as '*a systematic process for continuously improving management policies and practices by learning from the outcomes of previously employed policies and practices*' where '*management is treated as a deliberate experiment for purposes of learning*' (Millennium Ecosystem Assessment, 2005). Whilst strategic management can be viewed as a cross-departmental approach to planning, designing, construction and maintenance, adaptive management is an inter-departmental approach coupling visionary policy-making with operational maintenance.

Adaptive management implies iterative, collective decision-making and learning with knowledge co-production that integrates not only scientists and managers but also other stakeholders (Kingsford et al., 2017). In addition to its trans-disciplinary character, another fundamental point of this approach is the existence of dynamic feedback loops, something that fits well with the non-linear process of strategic management.

Key literature:

- FEMAT (Forest Ecosystem Management Assessment Team). (1993). *Forest ecosystem management: An ecological, economic, and social assessment*. U.S. Government Printing Office. https://www.fs.usda.gov/r6/reo/library/downloads/documents/FEMAT-1993-Report.pdf
- Kingsford, R. T., Roux, D. J., McLoughlin, C. A., et al. (2017). Strategic adaptive management (SAM) of intermittent rivers and ephemeral streams. In T. Datry, N. Bonada, & A. Boulton (Eds.), *Intermittent rivers and ephemeral streams: Ecology and management* (pp. 535–562). http://dx.doi.org/10.1016/B978-0-12-803835-2.00021-8
- Millennium Ecosystem Assessment. (2005). *Ecosystems and human well-being: Synthesis*. Island Press. https://www.millenniumassessment.org/documents/document.356.aspx.pdf
- Randrup, T. B., Jansson, M., Sjöman, J. D., et al. (2023). Planning, designing and managing green infrastructure and urban forests for biocities – Introducing a strategic and adaptive management approach. In Scarascia-Mugnozza & Boeri (Eds.), *Transforming biocities* (pp. 85–107). European Forest Institute (EFI). http://dx.doi.org/10.1007/978-3-031-29466-2_4

3.4. Urban Forestry

Urban forestry is generally defined as "*the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society*", (Helms, 1998, p. 193). The term community forestry is sometimes combined with urban forestry as in 'Urban and Community Forestry' (Konijnendijk et al., 2006).

An explosion of activity in urban forestry occurred in North America during the 1970s and 1980s (Jorgensen, 1993; Miller, 1997). The planning and management of public greenspace in Europe had been rather sectoral, with city parks, street trees, woodland, flowerbeds, etc. often having their own experts and/or municipal unit or department. Only later did more comprehensive approaches to green spaces planning and management emerge, for example under the influence of the fields of urban and landscape ecology, especially during the 1970s. The period from the mid-1990s saw various national as well as international networks develop, which had urban forestry as a central theme (Konijnendijk et al., 2006). Lately, the United Nations Food and Agriculture Organization (FAO) has re-vitalized the concepts of urban and peri-urban forestry (e.g. FAO, 2016) by emphasizing that forests and trees in urban and peri-urban

environments, if properly managed, can make important contributions to the planning, design and management of sustainable, resilient landscapes.

Key literature:

- FAO. (2016). *Guidelines on urban and peri-urban forestry*, by F. Salbitano, S. Borelli, M. Conigliaro, and Y. Chen. FAO Forestry Paper No. 178. Food and Agriculture Organization of the United Nations. https://openknowledge.fao.org/server/api/core/bitstreams/9c27d98b-8071-4ee7-8fc4-e0b430f8a8dc/content
- Helms, J. (Ed.). (1998). *The dictionary of forestry*. Society of American Foresters.
- Jorgensen, E. (1993). The history of urban forestry in Canada. In G. Blouin & R. Comeau (Eds.), *Proceedings of the First Canadian Urban Forests Conference, May 30–June 2, 1993* (pp. 14–18). Winnipeg, MB.
- Konijnendijk, C. C., Ricard, R. M., Kenney, A., & Randrup, T. B. (2006). Defining urban forestry – A comparative perspective of North America and Europe. *Urban Forestry & Urban Greening, 4*(3-4), 93–103. https://doi.org/10.1016/j.ufug.2005.11.003
- Miller, R. W., Hauer, R. J., & Werner, L. P. (2015). *Urban forestry: Planning and managing urban greenspaces* (3rd ed.). Waveland Press Inc.

4. Governance of Forested Landscapes

4.1. Governance

Governance as a concept has been defined as "*the many ways in which public and private actors from the state, market and/or civil society govern public issues* [or commons] *at multiple scales, autonomously or in mutual interaction*" (Arts & Visseren-Hamakers, 2012). Governance is thus about organization and decision-making processes.

It is important to recognize a governance 'situation' to be able to apply the tools and frameworks that we present in the next sections, whether to handle the situation or simply to understand it. In the literature, the concept of governance has been described and defined from very diverse perspectives, however, for this compendium we will refer to two overall fields of study.

One is the understanding of governance from a management perspective, whether public i.e., a municipality; or private i.e., a non-government institution. Here governance is often seen as a trend, or a demand, to involve interested parties (stakeholders) for a range of different reasons (e.g. Gentin et al., 2022). Focus is often on *how to* 'perform governance', which may include engagement, coordination, facilitation or conflict resolution.

Another field of study has more focus on *understanding* existing governance structures. While managers, planners or coordinators need tools that help facilitate governance, a thorough understanding of the underlying social aspects and dynamics of governance is necessary. These include formalised as well as non-formalised rules which already lie beneath the governance of several public issues and commons (Felice & Vatiero, 2012), some with long historical roots, and others emerging when needed. Here, a general objective is often to understand *why* governance structures have become what they are, and *how* they persist, adapt, evolve or dissolve (e.g. Lund & Rutt, 2015).

Key literature

- Arts, B., & Visseren-Hamakers, I. (2012). Forest governance: A state of the art review. In B. Arts et al. (Eds.), *Forest-people interfaces: Understanding community forestry and biocultural diversity*. Wageningen Academic Publishers. https://doi.org/10.3920/978-90-8686-749-3_15
- Felice, F., & Vatiero, M. (2012). Elinor Ostrom and the solution to the tragedy of the commons. *American Enterprise Institute (AEI)*. https://www.aei.org/articles/elinor-ostrom-and-the-solution-to-the-tragedy-of-the-commons/
- Gentin, S., Herslund, L. B., Gulsrud, N. M., & Hunt, J. B. (2022). Mosaic governance in Denmark: A systematic investigation of green volunteers in nature management in Denmark. *Landscape Ecology*. https://doi.org/10.1007/s10980-022-01421-z
- Lund, J. F., & Rutt, R. L. (2015). The logic of professionalization in participatory forestry. *Department of Food and Resource Economics, University of Copenhagen. Policy Briefs (Copenhagen Centre for Development Research)*, No. 03/2015. http://dx.doi.org/10.1016/j.forpol.2015.07.009

4.2. Organisational Structures

An organisation is a social structure composed of individuals or groups of people working together to achieve specific goals or objectives. Key characteristics of organizations include: i) a common goal,

purpose or mission, which provides a reason for their existence and the objectives they aim to achieve; ii) clearly delimited boundaries to be capable of distinguishing members from non-members; iii) clearly defined roles and responsibilities, and authority to perform different tasks, (iv) co-operative relationships, being more or less encouraged and needed, (v) hierarchy, as most organisations consist of at least three different organisational levels, most notably policy, tactical, and operational (Randrup & Jansson, 2020).

Organisations play a vital role in society by contributing to economic development, providing goods and services, creating jobs, addressing social and environmental needs, and facilitating collaboration among individuals with common interests or goals. The structure, purpose, and function of an organization can vary significantly, but they all share the fundamental characteristic of coordinated efforts to achieve specific objectives. Organizations exist in both the private and public sectors, however there are fundamental differences between a public and a private organization, in terms of ownership, purpose, funding, accountability and decision-making.

Non-government organisations (NGOs) categorise as private organisations, albeit they may receive substantial funding from the state. An NGO can be defined as an institution with five key characteristics: Organised, private, non-profit-distributing, self-governing and voluntary, at least in part. They may work transnationally and often in unpredictable environments due to e.g. political shifts, changing policies and donor foci (Watkins et al., 2012).

Key literature:

- Randrup, T. B., & Jansson, M. (2020). Strategic management of urban open spaces. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 190–203). Routledge.
- Watkins, S. C., Swidler, A., & Hannan, T. (2012). Outsourcing social transformation: Development NGOs as organizations. *Annual Review of Sociology, 38*, 285–315. http://dx.doi.org/10.1146/annurev-soc-071811-145516

4.3. Governance Paradigms

In science, the term "paradigm" most often refers to the definition made by Kuhn (1962), where he claims that science does not evolve gradually towards a single 'truth'. Instead, a certain understanding of reality remains constant before going through a paradigmatic shift, when the current theories or understandings cannot explain a phenomenon and new theories are proposed. A paradigm shift occurs when a new paradigm better explains the observations and offers a model that seems closer to the external reality, and if the new paradigm is essentially different from the old one, and is accepted by the scientific community.

In governance, when a group of people, e.g. in a sector or administration, share assumptions, concepts, values and practices that constitute a certain way of viewing and acting, these can resemble 'a paradigm'. Public governance paradigms are defined as "a relatively coherent and comprehensive set of norms and ideas about how to govern, organize and lead the public sector" (Torfing et al., 2020). While paradigms tend to replace each other, previous sets of norms and ideas often continue to co-exist and even compete with emerging ones (Ibid). In the following section, we describe the governance paradigms related to public institutions and the forestry sector, in section 4.5 we describe specific characteristics of governance in the Global South.

<u>Key literature</u>

- Kuhn, T. S. (1962). *The structure of scientific revolutions*. International Encyclopedia of Unified Science. University of Chicago Press.
- Torfing, J., Andersen, L. B., Greve, C., & Klausen, K. K. (2020). *Public governance paradigms: Competing and co-existing* (Policy, Administrative and Institutional Change series). Edward Elgar Publishing. https://doi.org/10.4337/9781788971225

4.3.1. The Bureaucracy Paradigm

The emergence of bureaucracy can be drawn back to the US President Wilson (1856-1924), who argued that in public management, a distinction should be drawn between politics and administration. Politics would set the direction, whereas the purpose of administration would be to move in the set direction in an efficient and effective manner (Torfing et al., 2020). Thus, public management would be directed by impersonal authority and political neutrality.

The Bureaucracy Paradigm adheres to fixed rules and a hierarchy of authority. It is characterized by privileging merit-based recruitment and specialized roles, together with uniform principles of placement, promotion and transfer of personnel within the administrative system, careerism, and a systematic salary structure. In this paradigm, public organizations are characterized by their hierarchical structures which clearly delimit responsibilities and secure accountability. However, this led to a popular understanding of bureaucracy as an often excessively complicated system of administrative procedures and rules (Ibid). Elements of the Bureaucracy Paradigm are recognized in most organizations, whether public or private, where strong distinctions between the overall leadership (policy level) are separated from the actual planning and management (tactical level), and often more profoundly from the operational level (Randrup & Jansson, 2020). This is also referred to as lack of vertical alignment within an organization (Sign et al., 2021).

<u>Key literature</u>

- Randrup, T. B., & Jansson, M. (2020). Strategic management of urban open spaces. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 190–203). Routledge. ISBN 9780367173036
- Singh, G. G., Cottrell, R. S., Eddy, T. D., & Cisneros-Montemayor, A. M. (2021). Governing the land-sea interface to achieve sustainable coastal development. *Frontiers in Marine Science, 8*, 709947. https://doi.org/10.3389/fmars.2021.709947
- Torfing, J., Andersen, L. B., Greve, C., & Klausen, K. K. (2020). *Public governance paradigms: Competing and co-existing* (Policy, Administrative and Institutional Change series). Edward Elgar Publishing. ISBN 9781788971218 https://doi.org/10.4337/9781788971225

4.3.2. Professional Rule Paradigm

A 'Profession' is a professional trait that is achieved collectively, and based on expert knowledge, specialized education, and a code of ethics developed through qualifications, training and socialization (Torfing et al., 2020). The Professional Rule Paradigm emerged as a response to the growing specialization

of knowledge, and specialized roles in the public administration where professionals such as doctors in medicine, and judges in law, among others, were leading in society. Thus, Professional Rule involves an understanding of steering and leadership whereby well-educated professionals are assumed to possess the best knowledge and can therefore be trusted to govern themselves based on their professional norms and highly specialized knowledge. According to this understanding, professions become collective actors, and the better the economic and sociological basis of relevant professions are within a given field, the more important will professional rule be – as a governance paradigm (Torfing et al., 2020).

Professional rule signals professional autonomy, which is in contradiction to how many of the contemporary societal challenges in general are believed to be solved via inter-, or cross disciplinary approaches. Professional rule remains within most public organizations today, e.g. in local governments where social, cultural and technical issues are dealt with within their own professions, values and common understandings and are usually organized in different units or departments. However, the highly specialized roles of a profession could lead to a silo structure problem within public management. This means that while specific professional knowledge might be needed within an organization to sufficiently deal with important issues, stronger silo effects may counteract cooperation across different organization units. This is also referred to as a lack of horizontal alignment within an organization (Sighn et al., 2021).

Key literature

- Randrup, T. B., & Jansson, M. (2020). Strategic management of urban open spaces. In M. Jansson & T. B. Randrup (Eds.), *Urban open space governance and management* (pp. 190–203). Routledge. ISBN 9780367173036
- Singh, G. G., Cottrell, R. S., Eddy, T. D., & Cisneros-Montemayor, A. M. (2021). Governing the land-sea interface to achieve sustainable coastal development. *Frontiers in Marine Science, 8*, 709947. https://doi.org/10.3389/fmars.2021.709947
- Torfing, J., Andersen, L. B., Greve, C., & Klausen, K. K. (2020). *Public governance paradigms: Competing and co-existing* (Policy, Administrative and Institutional Change series). Edward Elgar Publishing. ISBN 9781788971218 https://doi.org/10.4337/9781788971225

4.3.3. New Public Management

New Public Management (NPM) was a reform movement from the 1980s that aimed to re-invent and re-vitalize public governments (Hood, 1985). The emergence of NPM was guided by a general (or politically driven) assumption that private-sector management practices were better than management practices within the public sector. Hence, NPM signaled a shift from traditional public administration approaches towards embracing market-oriented strategies. This means that in order to improve the public administration performance and efficiency, the public sector would need to adopt practices and management techniques applied in the private business sector, for example through the outsourcing of different public services, such as building cleaning and green space maintenance, instead of integrating them within public organizations. Hence these would lead to a better and more efficient use of public resources through the implementation of price signals and competitive contracting processes. The public sector would not only foster the growth of a private service provider industry but could also reduce its own costs associated with the integration of all services within the public administration.

New Public Management as a public governance paradigm is characterized by increased professionalism in the public sector generated primarily via competition between public and private service providers or as a competition between private companies for delivering public services. Hence NPM also led to the adoption of governance mechanisms from the private sector such as performance standards and performance measures, emphasis on control of output and outcomes, as well as split of organizational units (e.g., division of the siloes, mentioned under Professional Rule) (Torfing et al., 2020).

NPM as a concept has been applied in many countries and is still influencing public management organizations. However, in its 'pure' form, NPM has been shown to require significant transaction costs, and the true value of engaging private companies in traditional public arenas has been discussed and questioned (Lindholst et al., (2020).

Key literature

- Hood, C. (1995). The "new public management" in the 1980s: Variations on a theme. *Accounting, Organizations and Society, 20*(2–3), 93–109. https://doi.org/10.1016/0361-3682(93)E0001-W
- Lindholst, A. C., Dempsey, N., Randrup, T. B., & Solfjeld, I. (2020). Lessons from case studies: Working with marketization. In A. C. Lindholst & M. B. Hansen (Eds.), *Marketization in local government: Evolution and diffusion in Scandinavia and England* (pp. 293–311). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-32478-0_15
- Torfing, J., Andersen, L. B., Greve, C., & Klausen, K. K. (2020). *Public governance paradigms: Competing and co-existing* (Policy, Administrative and Institutional Change series). Edward Elgar Publishing. ISBN 9781788971218. https://doi.org/10.4337/9781788971225

4.3.4. New Public Governance

New Public Governance (NPG) is an emerging paradigm that places emphasis on 'what actors can achieve together, but cannot achieve themselves' (Torfing et al., 2020). Decision makers often fall short of achieving their targets due to failing to draw on expertise, perspectives, and ideas of relevant stakeholders at lower organizational levels or external to the organization. Thus while within public management organizations there is a need for the adoption of cross-silo approaches internally, there is also a need for approaches that extend beyond organizational boundaries. It is imperative to engage and involve the many stakeholders pursuing an interest or having a direct share in the actual management of a forested landscape within networked collaborations.

Key characteristics of NPG are trust, knowledge sharing, creative thinking and social experimentation, to spur joint solutions to common problems. NPG has been described as a possible alternative to New Public Management (NPM). Where NPM is characterized by contractual relationships, NPG deals with cross-boundary cooperation and even partnerships between public and private. These can take many forms, such as long-term infrastructure partnerships, innovation partnerships, urban development partnerships, service partnerships, policy partnerships etc. (Torfing et al., 2020). Thus, NPG takes a social orientation, creating mutual dependencies, via trust-based steering and management between public employees and users, citizens and stakeholders, to mobilize local resources (Buijs et al., 2016).

Key literature

- Buijs, A. E., Mattijssen, T. J. M., van der Jagt, A. P. N., Ambrose-Oji, B., Andersson, E., Elands, B. H. M., & Møller, M. S. (2016). Active citizenship for urban green infrastructure: Fostering the diversity and dynamics of citizen contributions through mosaic governance. *Current Opinion in Environmental Sustainability, 22*, 1–6. https://doi.org/10.1016/j.cosust.2017.01.002
- Torfing, J., Andersen, L. B., Greve, C., & Klausen, K. K. (2020). *Public governance paradigms: Competing and co-existing* (Policy, Administrative and Institutional Change series). Edward Elgar Publishing. ISBN 9781788971218. https://doi.org/10.4337/9781788971225

4.3.5. Scientific Forestry Paradigm

The scientific forestry paradigm is predominant in Europe and incorporates the characteristics of both the bureaucratic and the professional rule paradigms. It is also referred to as 'professional', 'industrial', 'sustained yield' or 'conventional' forestry.

The paradigm emerged as the result of the introduction of forestry management practices to control the growth, composition and structure of the forests in order to sustain the forest as a capital, i.e. ensure the continuous supply of timber for future generations. The paradigm spread from Europe to the rest of the world, through the historical colonization processes, and although results in terms of production or profits in many countries in the Global South have failed to show, the model still highly affects forest governance structures everywhere in the world. Key characteristics of this paradigm are that both forest management and governance are highly professionalised and top-down. Management targets mainly volume or profit (e.g. Brukas & Weber, 2009) but can also attempt to embrace multiple functions (e.g. Larsen, 2012). Forests are, however, still tall, even-aged and either monocultures, or managed for just a few species.

The governance structure within this paradigm is highly professionalised and bureaucratic. Since production is for the market, however, fluctuations and trends here also influence decisions. Branding, in the form of forest certification, is an example of a market-based mechanism that influences management decisions. Bass (2004) provides a range of the assumptions behind forest certification. Two of the most known certification schemes are the Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC). You must hold one of these to obtain the Sustainable Biomass Program (SBP) certificate. Thorough descriptions of these and several other certification schemes can be found at www.preferredbynature.org.

Contemporary environmental crises have renewed debates on the role and management of European forests and therefore also on their governance. In the Scandinavian countries for example, this has led to the revision of Forest Acts, in order to allow for management serving other purposes than timber production, i.e. recreation and environmental purposes (Siiskonen, 2013). The scientific forestry paradigm is being challenged, and perhaps we will experience forests in the future that both look different from what we are used to and involve a range of different actors and knowledge systems for their governance and management.

Key literature:

- Bass, S. B. (2004). Certification. In *Sustainable forest management* (pp. 1350–1356).
- Brukas, V., & Weber, N. (2009). Forest management after the economic transition—At the crossroads between German and Scandinavian traditions. *Forest Policy and Economics, 11*(8), 586–592. https://doi.org/10.1016/j.forpol.2009.08.009

- Larsen, J. B. (2012). Close-to-nature forest management: The Danish approach to sustainable forestry.
- Siiskonen, H. (2013). From economic to environmental sustainability: The forest management debate in 20th century Finland and Sweden. *Environment, Development and Sustainability, 15*, 1333–1336. https://doi.org/10.1007/s10668-013-9442-4

4.3.6. Community-based Forestry Paradigm

The Community-based Forestry Paradigm is also referred to as 'participatory' forestry or forestry based on traditional knowledge and is most often contrasted to the scientific forestry paradigm. Their main *management* difference is found in the un-even aged forestry system employed by the community-based forestry paradigm versus the even aged system promoted by the scientific forestry paradigm.

Governance within the community-based forestry (CBF) or community-based forest management (CBFM) paradigm can take a range of different shapes, all of which take a bottom-up, user-based approach to decision-making on forest-related issues, and base management on other knowledge systems than the formal and professional/scientific ones. Siiskonen (2013) describes how the two paradigms evolved and conflicted in Sweden and Finland, reminding us that such controversies —which we usually associate with decentralisation challenges in the Global South— have played out right here in Scandinavia, and not that long ago.

The Community-based Forestry Paradigm emerged in the late 20th century as a system to address both forest degradation and poverty in the Global South. It is now widespread as a paradigm, and appears to have improved forest conservation and management, while poverty alleviation has failed to materialize. An explanation may be that despite ambitions of a bottom-up approach to forest management, the scientific paradigm still seems to prevail, especially regarding governance structures that maintain power with professional foresters and mainly benefit local elites (Lund, 2015). Moreover, clear property and land tenure rights are recognized as decisive in maintaining traditional forest knowledge and management (Park et al. 2023; Dooley et al. 2018), but are often lacking or contested.

Park et al. (2023) provide a comprehensive overview of predominant forest discourses since the millennium, including those of community-based forestry, traditional forest knowledge and participation.

Key literature

- Dooley, K., Stabinsky, D., Stone, K., Sharma, S., Anderson, T., Gurian-Sherman, D., & Riggs, P. (2018). *Missing pathways to 1.5°C: The role of the land sector in ambitious climate action*. Climate Land Ambition and Rights Alliance. https://climatelandambitionrightsalliance.org/report
- Lund, J. F. (2015). Paradoxes of participation: The logic of professionalization in participatory forestry. *Forest Policy and Economics, 60*, 1–6. https://doi.org/10.1016/j.forpol.2015.07.009
- Park, M. S., Lee, H., Shin, S., & Lee, S. (2023). Identification of long-standing and emerging agendas in international forest policy discourse. *Trees, Forests and People, 12*, 100385. https://doi.org/10.1016/j.tfp.2023.100385
- Siiskonen, H. (2013). From economic to environmental sustainability: The forest management debate in 20th century Finland and Sweden. *Environment, Development and Sustainability, 15*, 1333–1336. https://doi.org/10.1007/s10668-013-9442-4

4.4. Global Environmental Governance

Environmental problems, climate change and declining biodiversity are transboundary challenges and demand global coordination. This is an immense challenge which requires governance at a global level. Hence historically, several attempts to organize global efforts to prevent and reduce the foreseen consequences of environmental crises have taken place in the forms of international meetings and action agreements.

The first generation of international agreements attempted to address specific environmental problems resulting in sectoral, single-issue treaties, e.g. to protect migratory species (Convention on the Conservation of Migratory Species of Wild Animals (CMS), https://www.cms.int), or wetlands (Convention on Wetlands (RAMSAR), https://www.ramsar.org). Such conventions – or treaties - are known as Multilateral Environmental Agreements (MEAs). Global environmental governance, as a consequence, presented itself in a very fragmented way during the 1980s.

The second generation approaches to solving environmental problems emerged as so-called 'framework conventions' that are more organic in their structure and content. The most well-known are the United Nations Framework Convention on Climate Change (UNFCCC) (https://unfccc.int), and the Convention on Biological Diversity (UNCBD) (https://www.cbd.int) resulting from the Earth Summit in Rio de Janeiro in 1992. National governments constitute the parties to these conventions, and they meet regularly at the Conferences of the Parties (COPs) to agree on common goals. How to reach the goals is up to the parties themselves, but they must report initiatives taken and their progress towards the goals. Due to Brazil's opposition, the Forest Principles became specific and are not part of the Rio Conventions.

Other organisations, both intergovernmental and non-governmental, can participate in the COPs, sometimes with the right to be observers. They engage in lobbyism as a link between civil society and government negotiators and can host so-called side events. To some marginalised groups, like indigenous peoples, the COPs provide a platform and the Conventions leverage for voicing their rights and needs.

Two discourses compete at the COPs: one based on science, technology and investments in the 'green transition' (formerly 'green growth'), another on bottom-up solutions based on divestment, local solutions and governance. The latter is mostly promoted by civil society organisations (e.g. Dooley et al., 2018) and some of the governmental negotiators from the Global South.

Key literature:

- Dooley, K., et al. (2018). *Missing pathways to 1.5°C: The role of the land sector in ambitious climate action*. Climate Land Ambition and Rights Alliance. https://climatelandambitionrightsalliance.org/report

4.5. Governance in the Global South

The term 'Global South', as opposed to 'developing countries' or 'third world', signals that geopolitical power relations exist despite the homogenizing concept of a 'globalized world'. It references to an entire history of colonialism, coloniality and differential economic and social change, calling attention to the maintenance of large inequalities in living standards, life expectancy and access to resources. The inequalities exist between the Global North and South as well as within Global South governance regimes, of which many still adhere to inherited colonial structures (Breen et al., 2020; Ordóñez et al., 2023).

Like in the Global North, there has been a push towards governance, as opposed to government, of both forests and urban green spaces (UGS). Breen et al. 2020 reviewed 47 publications on UGS in Latin America and found that community-run initiatives were consistent across the temporal span of the articles. This is no surprise since the new public management paradigm in the Global South led to a minimisation of the State, and outsourcing of public services to the private sector, including that of NGOs. Indigenous ways of organizing life, and of perceiving relations to nature, society, politics, economy and space were already invisibilised. Paradoxically the neoliberal period allowed indigenous communities to organize themselves and reproduce their language, culture and communitarian practices (Christoffersen, 2018). Such self-developed governance institutions usually enjoy high legitimacy among local citizens. The challenge, according to Breen et al. (2020), is for the local governments to acknowledge their existence in the development towards inclusive UGS management and governance.

Global South characteristics like those described above can be found in the Global North as well, e.g. in the northern part of Sweden where disputes over land and resources play out between the Sámi population, mining companies and the state (Persson et al., 2017).

Key literature:

- Breen, A., Giannotti, E., Molina, M. F., & Vásques, A. (2020). From "government to governance"? A systematic literature review of research for urban green infrastructure management in Latin America. *Frontiers in Sustainable Cities, 2*, 572360. https://doi.org/10.3389/frsc.2020.572360
- Christoffersen, L. (2018). Amazonian erasures: Landscape and myth-making in lowland Bolivia. *Rural Landscapes: Society, Environment, History, 5*(1), 1–19. https://doi.org/10.16993/rl.43
- Ordóñez Barona, C., et al. (2023). Views of government and non-government actors on urban forest management and governance in ten Latin-American capital cities. *Land Use Policy*. https://doi.org/10.1016/j.landusepol.2023.106635
- Persson, S., Harnesk, D., & Islar, M. (2017). What local people? Examining the Gállok mining conflict and the rights of the Sámi population in terms of justice and power. *Geoforum, 86*, 20–29. https://doi.org/10.1016/j.geoforum.2017.08.009

4.6. Swedish Nature Conservation

We distinguish between two dominant discourses with regard to nature conservation and biodiversity promotion in Sweden. One is the 'traditional' conservationist approach, aiming to protect what remains of cultural and natural heritage in the landscapes. This encompasses wildlife habitats and threatened species, often said to relate to historic and iconic agricultural landscapes (Saltzman et al., 2011), as well as individual natural monuments such as large, old trees. Swedish conservationists argue for a legally binding set aside of land reserved for nature. Most land reserved for nature, National Parks, comprise alpine ecosystems in the north-western part of Sweden on land considered not useful for economic production (Roberge & Friers, 2020). Nature reserves, a conservation tool since 1964, comprise smaller areas but represent the largest share of today's formally protected forest area in Sweden.

The other dominant discourse is sustainable development, aiming to integrate environment and development policies with a main focus on the continued and stable supply of natural resources and services. A common argument relates to multi-functionality and the belief that nature and biodiversity can be accommodated within production areas or as part of other ecosystem-service solutions, rural as well as urban. In Sweden, where timber production has shaped the rural landscape during the past

century, the non-legally binding, voluntary set-aside of land within production regimes has been the dominant policy. Certification of forest products is an example (see 4.3.5, scientific forestry paradigm).

In parallel to the contemporary anthropocentric focus on nature's services to humans, a third trend is emerging that revolves around a biological understanding of nature as self-regulating. Natural processes like succession and hydrology are essential, and area size matters (Beninde et al., 2015). It manifests in both large scale rewilding experiments (e.g. Helmer et al., 2015) and in smaller-scale wilder urban landscapes. In smaller urban green spaces, cessation or lowering of the maintenance frequency of natural elements is increasingly used as a 'closer to natural' management practice (Chollet et al., 2018), although perhaps to a lesser degree in Sweden compared to other European countries.

<u>Key literature</u>

- Beninde, J., Veith, M., & Hochkirch, A. (2015). Biodiversity in cities needs space: A meta-analysis of factors determining intra-urban biodiversity variation. *Ecology Letters, 18*(6), 581–592. https://doi.org/10.1111/ele.12427
- Chollet, S., Brabant, C., Tessier, S., & Junget, V. (2018). From urban lawns to urban meadows: Reduction of mowing frequency increases plant taxonomic, functional, and phylogenetic diversity. *Landscape and Urban Planning, 180*, 121–124. https://doi.org/10.1016/j.landurbplan.2018.08.009
- Helmer, W., Saavedra, D., Sylvén, M., & Schepers, F. (2015). Rewilding Europe: A new strategy for an old continent. In H. Pereira & L. M. Navarro (Eds.), *Rewilding European landscapes* (pp. 171–190). Springer. http://dx.doi.org/10.1007/978-3-319-12039-3_9
- Roberge, J-M., & Fries, C. (Eds.). (2020). *Forest management in Sweden: Current practice and historical background*. Rapport 2020/4, pp. 27-33. Skogsstyrelsen. https://www.skogsstyrelsen.se/globalassets/om-oss/rapporter/rapporter-20222021202020192018/rapport-2020-4-forest-management-in-sweden.pdf
- Saltzman, K., Head, L., & Stenseke, M. (2011). Do cows belong in nature? The cultural basis of agriculture in Sweden and Australia. *Journal of Rural Studies, 27*(1), 54–62. https://doi.org/10.1016/j.jrurstud.2010.09.001

4.7. Governance Analytical Frameworks

In order to grasp what the situation of a particular governance arrangement or challenge is, analytical tools can be applied to provide a systematic approach to an understanding. The suggested literature introduces two frameworks that we have found useful.

Some aspects of the frameworks are overlapping. Actors, users, stakeholders, citizens etc. are commonly mentioned, and are in general defined as individuals, coalitions or institutions that influence the governance arrangement, i.e. exercise power over the landscape or natural resource/service in question. For the conscious effort to encompass all interested parties, including also those that are affected by an activity or decision, we advise a thorough stakeholder analysis.

Frameworks also frequently address power. This can be related to resources, or to legislative, executive and judicial powers. Power is a wide concept, so defining what is meant in an analysis is important.

4.7.1. The Policy Arrangement Approach

The policy arrangement approach (PAA) is a conceptual framework, visualized as a tetrahedron, developed in environmental policy studies to assist in understanding the stability of content and organization of a policy domain (Arts et al., 2006). A policy arrangement is defined as the state in which the interaction between political actors and resources and rules of the game solidifies in a temporary stable structure (institutionalization) before developments force them to readjust their interdependency. The PAA comprises of four profoundly interconnected dimensions: actors, resources, rules of the game, and discourses. Each of these dimensions affects the others and changes the shape of the entity, such as new actors' appearance may lead to new division of resources, new rules of the game and/or new discourses.

Three papers (Halušková, 2022; Ahebwa et al., 2012; Contesse et al., 2018) present examples of the application of the PAA.

Key literature

- Ahebwa, W. M., van der Duim, R., & Sandbrook, C. (2012). Tourism revenue sharing policy at Bwindi Impenetrable National Park, Uganda: A policy arrangements approach. *Journal of Sustainable Tourism, 20*(3), 377–394. https://doi.org/10.1080/09669582.2011.622768
- Arts, B., Leroy, P., & van Tatenhove, J. (2006). Political modernisation and policy arrangements: A framework for understanding environmental policy change. *Public Organization Review, 6*, 93–106. https://doi.org/10.1007/s11115-006-0001-4
- Contesse, M., van Vliet, B. J. M., & Lenhart, J. (2018). Is urban agriculture urban green space? A comparison of policy arrangements for urban green space and urban agriculture in Santiago de Chile. *Land Use Policy, 71*, 566–577. https://doi.org/10.1016/j.landusepol.2017.11.006
- Halušková, L. (2022). The Slovak forest policy arrangement: Post-1989 residues and changes. *Journal of Forest Science, 68*, 395–412. http://dx.doi.org/10.17221/105/2022-JFS

4.7.2. The Combined Governance and Management Model

There are many similarities and overlaps between governance and management of forested landscapes, and the main aspects of governance and management can be brought together in a combined governance and management (G&M) model and theoretical framework (Jansson et al., 2019). The G&M model can be used to explore governance aspects, such as organisational form and development of spaces.

The G&M model is based on the park-organisation-user model (Randrup & Persson, 2009), the policy arrangement approach (see 4.7.1) and the hierarchical closed and open co- and self-governance scale defined by Arts & Visseren-Hamakers (2012). It contains the three interrelated dimensions of the park-organisation-user model; 'landscape', 'public actors' and 'users/private enterprises' (see Jansson et al. 2019, figure 5). In figure 5, the landscape in question can be private or public, and thus not necessarily publicly accessible. The four dimensions of the policy arrangement tetrahedron are shown via the 'rules of the game', and these are listed next to each 'actor' as arrows for user and administration 'discourses' between any relevant actors. 'Resources' are listed next to the related 'power' arrows, indicating level of power through the thickness of the arrows. Various governance modes can be illustrated by elaborating the arrows in the model.

Key literature

- Arts, B., & Visseren-Hamakers, I. J. (2012). Forest governance: Mainstream and critical views. *ETFRN News, 53*, 3–10. https://edepot.wur.nl/211957
- Jansson, M., Vogel, N., Fors, H., Dempsey, N., Buijs, A., & Randrup, T. B. (2019). The governance of landscape management: New approaches to urban open space development. *Landscape Research, 44*(8), 952–965. https://doi.org/10.1080/01426397.2018.1536199
- Randrup, T. B., & Persson, B. (2009). Management of public green space in the Nordic countries – Development of a new strategic green space management regime. *Urban Forestry & Urban Greening, 8*(1), 31–40. http://dx.doi.org/10.1016/j.ufug.2008.08.004

4.7.3. The Decentralization Framework

Decentralization has been defined as any act in which a central government formally cedes powers to actors and institutions at lower levels in a political-administrative and territorial hierarchy (Mawhood, 1983). The Decentralization Framework, presented by Agrawal and Ribot (1999), suggests that three distinct dimensions underlie all acts of decentralization: actors, powers, and accountability.

Actors are typically located in particular relations of accountability and have certain types of powers. Since decentralization is about changes in how actors at different levels of political authority exercise their power, by definition the actors involved would be located at different levels of action. In actual cases, any one or a combination of actors may be seen as the appropriate legal persons toward whom decentralization should occur (Ibid).

Agrawal and Ribot (1999) distinguish between four broad powers as being crucial to understanding decentralization: i) the creation of rules, ii) decision-making about how a particular resource or opportunity is to be used, iii) ensuring compliance and iv) arbitrating disputes.

The allocation of different sets of powers of decision-making and rule-making to lower-level actors creates decentralization. The effectiveness of decentralization hinges on the third dimension: accountability. Agrawal and Ribot (1999, p. 10) suggest *"that if powers are decentralized to actors who are not accountable to their constituents, or who are accountable only to themselves or superior authorities within the structure of the government, then decentralization is not likely to accomplish its stated aims."*

Agrawal & Ribot (1999) provide four cases as examples that help understand how their framework may be applied.

Key literature

- Agrawal, A., & Ribot, J. (1999). Accountability in decentralization: A framework with South Asian and West African cases. *The Journal of Developing Areas, 33*(4), 473–502. http://www.scopus.com/inward/record.url?scp=0033363849&partnerID=8YFLogxK
- Mawhood, P. (1983). *Local government in the third world*. John Wiley.
- Smith, B. C. (2023). *Decentralization: The territorial dimension of the state*. Taylor & Francis.

4.7.4. Mosaic Governance

Mosaic governance builds on active citizenship, as a vital contribution to environmental resilience through green space creation, restoration, enhancement and maintenance efforts (Buijs et al., 2016). The concept was developed to help analyse active citizenship in relation to urban green infrastructure planning (Buijs et al., 2019). However, the concept has been applied widely and may be applied in citizen involvement activities in a variety of (local) governmental lead processes.

Buijs et al. (2016) define Mosaic Governance as a recognition of governance that is sensitive to the diversity and dynamics of active citizenship and which aligns with local informal networks and across scales. The concept emphasises that there is unlikely to be a single combination of governance instruments with optimal and resilient outcomes for both the environment and local people. Thus, the concept has been proposed to develop mechanisms and interventions that link up active citizenship with a spatially connected network of urban greenspaces that have varying levels of multifunctionality at different scales (Buijs et al., 2016).

Gentin et al. (2022) explored green volunteering in Denmark from the perspective of nature managers in municipalities and state nature agencies. They provide an understanding of the nature and extent of volunteering in Danish nature management.

Key literature

- Buijs, A. E., Hansen, R., Van der Jagt, S., et al. (2019). Mosaic governance for urban green infrastructure: Upscaling active citizenship from a local government perspective. *Urban Forestry & Urban Greening, 40*, 53–62. https://doi.org/10.1016/j.ufug.2018.06.011
- Buijs, A. E., Mattijssen, T. J., Van der Jagt, A. P., et al. (2016). Active citizenship for urban green infrastructure: Fostering the diversity and dynamics of citizen contributions through mosaic governance. *Current Opinion in Environmental Sustainability, 22*, 1–6. https://doi.org/10.1016/j.cosust.2017.01.002
- Gentin, S., Herslund, L. B., Gulsrud, N. M., & Hunt, J. B. (2022). Mosaic governance in Denmark: A systematic investigation of green volunteers in nature management in Denmark. *Landscape Ecology*. https://doi.org/10.1007/s10980-022-01421-z

4.7.5. The Inquiry-based Governance Framework

Mansourian et al. (2019) provide a third, inquiry-based governance framework that includes three types of actions to assess governance challenges and solutions: mapping stakeholders, contextualising and re-scaling. First, the need for a comprehensive stakeholder mapping is proposed (see e.g. under Landscape Actors: Stakeholder and Users). Then in "contextualizing", key political, social, ecological and economic perspectives are assessed. Also, key stakeholder issues such as potential constraints to motivations to restore forests need analysis (e.g. laws, food, protection of water, timber value etc.). Finally, re-scaling relates to considering the geographical scale(s) of the project, and how this may, or may not relate or correspond to an administrative scale, i.e., which institutions operate at the specific scale(s), etc.

Mansourian et al. (2019) applied the framework to three different forest landscape restoration projects in different countries. As the framework has a focus on governance at different geographical and administrative scales, it can be a valuable analytical tool. To complement the framework, they designed a questionnaire and interview guide.

Key literature:

- Mansourian, S., Walters, G., & Gonzales, E. (2019). Identifying governance problems and solutions for forest landscape restoration in protected area landscapes. *Parks, 25*(1). http://dx.doi.org/10.2305/IUCN.CH.2019.PARKS-25-1SM.en

4.8. Good governance

Azzahra (2023) describes the need to implement 'Good Governance' in Indonesia, and in doing so, refers to several of the paradigms described by Torfing et al. (2020). Commonly, countries take diverse approaches to enhance their governance systems, while affirming adherence to global norms and standards. International organizations, such as the UN, play a pivotal role in promoting so-called good governance by providing frameworks, guidelines, and support to member states. UNDP (2014) for example, suggests some key characteristics of good governance: Participatory, Transparent, Accountable, Equitable, Promoting the rule of law, Consensus seeking, and ensuring the participation of vulnerable populations in decision-making.

- Azzahra, A. (2023). Implementation of good governance in public services at local government. *International Journal of Social Service and Research, 3*(7), 1899–1906. https://doi.org/10.46799/ijssr.v3i7.594
- UNDP. (2014). *Discussion paper: Governance for sustainable development integrating governance in the post-2015 development framework*. United Nations Development Programme. https://www.undp.org/publications/discussion-paper-governance-sustainable-development

5. Contemporary concepts

5.1. Sustainability

Environmental concerns for our planet increased during the 1980s but emerged decades earlier, expressed in publications like 'Silent Spring' (Carson, 1962), or 'Limits to Growth' commissioned by the Club of Rome (1972). Transnational organisations like the International Union for the Conservation of Nature (IUCN - https://www.iucn.org), the World Wildlife Foundation (WWF - https://www.worldwildlife.org), and Greenpeace (https://www.greenpeace.org/international) were founded already in 1948, 1961 and 1971, respectively.

In 1987, 'Our Common Future', perhaps better known as the Brundtland report, linked development and environment and thoroughly established 'sustainable development' as a concept that prevailed in the Rio Conventions. Sustainability was defined as the ability to meet the needs of the present generation without compromising the ability of future generations to meet their own needs (Brundtland (1987). The concept involves the responsible use of resources, protection of the environment, and consideration of economic and social factors to ensure long-term well-being and balance.

Environmental sustainability focuses on preserving and restoring the natural environment, reducing negative impacts on the environment and minimizing resource depletion. Social sustainability emphasizes creating inclusive and equitable societies where human rights are respected, social justice (e.g. creating a fair and equal society by addressing inequalities in wealth, opportunities, and privileges) is promoted and a high level of quality of life is provided for all individuals. Social sustainability is sometimes broadened into social-cultural sustainability. Economic sustainability focuses on fostering and establishing a resilient economy that promotes long-term prosperity while the well-being of people and the planet is taken into consideration.

The Sustainable Development Goals (UN General Assembly, 2015), developed by the United Nations have helped broaden the definition of sustainability and revealed that it spans a wide variety of fields. A more contemporary sustainability approach is represented by economist Kate Raworth's (2017) visible framework, the 'Doughnut economic model', in which planetary and social boundaries are combined.

Key literature

- Brundtland, G. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. United Nations General Assembly document A/42/427.
- Carson, R. C. (1966). *Silent spring*. Houghton Mifflin Publishers.
- Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. III. (1972). *The limits to growth*. Potomac Associates – Universe Books.
- Raworth, K. (2017). *Doughnut economics: Seven ways to think like a 21st century economist*. White River Junction, Vermont: Chelsea Green Publishing.
- UN General Assembly. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1. https://sustainabledevelopment.un.org/post2015/transformingourworld/publication

5.2. Green Infrastructure

Green infrastructure (GI) comprises networks of natural areas that offer various ecosystem services. Green Infrastructure is often used in relation to planning, and the ambiguity in definitions can impact practical planning. We define GI in line with the definition made by the European Commission (2013), that GI is *"a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services in both rural and urban settings"*.

There are different definitions and connotations to what GI is and what it relates to. For example, the United States Environmental Protection Agency (2023), defines GI as systems used to manage stormwater for communities to become more resilient. However, GI has also been used as an umbrella term for large-scale and integrated land conservation (Benedict & McMahon, 2012). This was recognized by Seiwert & Rößler (2022), who described how GI gained prominence in discussions about urban green space development and provided numerous examples of how to dissect the origins, contexts, and influences of GI.

Key literature

- Benedict, M. A., & McMahon, E. T. (2012). *Green infrastructure: Linking landscapes and communities*. Island Press. ISBN 978-1-59726-764-9.
- Environmental Protection Agency. (2023). *What is green infrastructure?* United States Environmental Protection Agency.
- European Commission. (2013). *Green Infrastructure (GI) — Enhancing Europe's natural capital* (COM(2013) 149). https://www.eea.europa.eu/policy-documents/green-infrastructure-gi-2014-enhancing
- Seiwert, A., & Rößler, S. (2022). Understanding the term green infrastructure: Origins, rationales, semantic content and purposes as well as its relevance for application in spatial planning. *Land Use Policy, 97*, 104785. https://doi.org/10.1016/j.landusepol.2020.104785

5.3. Ecosystem services

Ecosystem services (ESS) are the benefits that humans receive from natural ecosystems. The Millennium Ecosystem Assessment (2015) defined ESS as "the benefits that people obtain from ecosystems". Forested landscapes provide multiple benefits to both the environment and the people who live in urban areas. These benefits range from increasing and protecting biodiversity and safeguarding against extreme weather events, to fostering community interaction and enhancing mental and physical well-being. Due to the wide variety of benefits that urban forests provide, their study crosses several fields and disciplines, including environmental sciences, urban planning, biological sciences, landscape architecture, urban forestry and public health, among others. Hence, an interdisciplinary approach is needed to provide a comprehensive understanding of the benefits and challenges associated with them (O'Brien et al., (2022).

Ecosystem services can be applied to better understand the values of nature for people. Four categories of ESS exist: Supporting (i.e., soil formation, nutrient cycling and primary production); Provisioning (i.e., food, fresh water, wood and fiber and fuel); Regulating (i.e., climate, flood and disease regulation and water purification); and Cultural (i.e., aesthetic, spiritual, educational and recreational aspects).

Forested landscapes can also show disservices or negative impacts on urban environments and communities, which are important to consider in planning and management (Dobbs et al., 2014). Some of the possible disservices of forested landscapes include: allergenic plants, when pollen production triggers allergies; debris and fallen leaves which can create maintenance challenges for cities; pests and diseases can be harbored by forests that can spread to other trees or even pose health risks to humans. The very concept, specifically illustrated by that of 'ecosystem dis-services', is of course thoroughly anthropocentric, but serves to draw attention to the need to protect natural environments.

Key literature

- Dobbs, C., Kendal, D., & Nitschke, C. R. (2014). Multiple ecosystem services and disservices of the urban forest establishing their connections with landscape structure and socio-demographics. *Ecological Indicators, 43*, 44–55. https://doi.org/10.1016/j.ecolind.2014.02.007
- Millennium Ecosystem Assessment (MEA). (2005). *Ecosystems and human well-being: A report of the Millennium Ecosystem Assessment*. Island Press. https://www.millenniumassessment.org/documents/document.356.aspx.pdf
- O'Brien, L. E., Urbanek, R. E., & Gregory, J. D. (2022). Ecological functions and human benefits of urban forests. *Urban Forestry & Urban Greening, 75*, 127707. https://doi.org/10.1016/j.ufug.2022.127707

5.4. Nature-based Solutions

Nature-based solutions (NBS) are approaches that use natural features to address environmental and societal challenges. They involve design as well as conservation, restoration and sustainable management of ecosystems and natural elements that provide benefits for both people and the planet. The International Union for Conservation of Nature (IUCN, 2020) defines NBS as "*actions that protect, sustainably manage, and restore natural or modified ecosystems, while addressing societal challenges and providing human well-being and biodiversity benefits*". The European Commission (2022) defines NBS to be "*solutions inspired and supported by nature, which are cost-effective, and simultaneously provide environmental, social, and economic benefits and help build resilience*".

After reviewing 20 definitions of NBS, Sowińska-Świerkosz & García (2022) identified NBS as interventions that: (1) are inspired and powered by nature; (2) address (societal) challenges or resolve problems; (3) provide multiple services/benefits, including biodiversity gain; and (4) are of high effectiveness and economic efficiency. Eggermont et al. (2015) categorized NBS into three overall typologies according to which ecosystem services they offer, their permanence, required maintenance, and the extent of human intervention. However, the concept has been widely discussed, not at least to what it can or should encompass and partly due to the fact that the NBS concept has emerged from the integration of multiple scientific fields (Sowińska-Świerkosz & García, 2022).

Key literature

- Eggermont, H., Balian, E., Azevedo, J. M. N., et al. (2015). Nature-based solutions: New influence for environmental management and research in Europe. *GAIA - Ecological Perspectives for Science and Society, 24*(4), 243–248. https://doi.org/10.14512/gaia.24.4.9

- European Commission. (2022). *Nature-based solutions*. https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_en
- IUCN. (2020). *Global standard for nature-based solutions: A user-friendly framework for the verification, design and scaling up of NbS* (First edition). IUCN. https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf
- Sowińska-Świerkosz, B., & García, J. (2022). What are nature-based solutions (NBS)? Setting core ideas for concept clarification. *Nature-Based Solutions, 2*, 100009. https://doi.org/10.1016/j.nbsj.2022.100009

5.5. Nature-based Thinking

Nature-based thinking (NBT) emerged as a critique of the emergence of primarily anthropogenic approaches to how the major societal challenges should be addressed, via the support of nature. Such anthropogenic approaches include Sustainability, Ecosystem Services and Nature-based Solutions, (Randrup et al., 2020). The main argument is that the Nature-based Solutions notion of "being inspired by nature" needs to be reconsidered acknowledging the interconnectedness of humans, nature and organizations in all nature-based interventions.

NBT can be considered a mindset or approach that draws inspiration from nature. This includes understanding patterns, processes and principles found in nature that can help guide decision-making and problem-solving. NBT encompasses the viewpoint of nature with people, not solely nature for people hence contributing to sustainable development. Randrup et al. (2020) described NBT to build on the three sustainability dimensions of ecology, social (community aspects), and economy. Each of these dimensions is vital to always include in any solution, but more importantly will be the relations between these three dimensions. Mercado et al. (2023) further developed the NBT concept and defined it as a mindset that integrates nature's patterns into sustainable decision-making, promoting a balance between human and ecological concerns for urban development. They emphasized that there are three overall aspects to consider when developing and managing NBS: the need for new ways of relating to nature, the need for new modes of governance, and a long-term perspective to all activities employed.

Key literature

- Mercado, G., Wild, T., Garcia, J. H., et al. (2023). Supporting nature-based solutions via nature-based thinking, across European and Latin American cities. *Ambio*. https://doi.org/10.1007/s13280-023-01920-6
- Randrup, T. B., Buijs, A., Konijnendijk, C. C., & Wild, T. (2020). Moving beyond nature-based solutions discourse: Introducing nature-based thinking. *Urban Ecosystems, 23*(4), 919-926. https://doi.org/10.1007/s11252-020-00964-w

5.6. Environmental Justice

Environmental justice addresses the inequality in how environmental benefits and burdens are distributed, often influenced by factors like race, class, and income. It underscores the uneven distribution of environmental assets, such as i.e., parks, and liabilities, such as i-e., waste sites, with marginalized communities typically facing the brunt. The concept emphasizes equal access to environmental decision-

making for all, respect for the diverse values and experiences of different groups, and recognizes the need to consider the environmental rights of future generations (Scott, 2014).

Environmental justice has emerged as a concept to promote increased recognition and to consider the ability of certain groups to participate and influence decision-making, and also to be recognized as legitimate actors in the process. Environmental justice encompasses how this is understood, often explained by the exploration of the classical components 'distributional justice' and 'procedural justice' (Vermunt & Törnblom, 1996), but also to the third type: recognition-based (Vogel et al., 2020). *Distributional justice* concerns the socially just allocation of resources, goods, and opportunities in a society. It is about *how resources are allocated*, and thus if this is done in a fair way among members of a society. In doing so, factors such as wealth, income, and social status should be taken into account. *Procedural justice* concerns the idea of fairness in *the processes* of allocating resources. One aspect of procedural justice is related to discussions of the administration of justice and legal proceedings (Vermunt & Törnblom, 1996)

Rutt and Gulsrud (2016) add 'recognition' and 'capabilities' as relevant inquiries when researching environmental justice in an urban green space (UGS) context. *Recognition-based justice* calls for the acknowledgement of excluded social groups and their inclusion in political spaces. They argue that recognition has an immense influence on how distribution and procedures occur. Capability represents the ability to fully function in society. To move toward justice, those less capable may need disproportionate attention. It is thus necessary for researchers, planners and managers to understand which capabilities are demanded of urban residents to use and be involved in the planning of UGS.

Key literature:

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- Vogel, N., F. Arler, N. Gulsrud & M. Jansson (2020) Ethical dimensions in urban open space governance and management. In: Jansson & Randrup (Eds). Open Urban Space Governance and Management. Routledge. Pp 93-111. http://dx.doi.org/10.4324/9780429056109-8

5.7. Social Ecological Technological Systems

Social-ecological-technological systems (SETS), have an urban outset and refer to integrated frameworks or approaches that consider the interplay between social, ecological, and technical elements when designing and implementing solutions to environmental and societal issues (Krueger, 2016). The concept involves a holistic perspective, recognizing the intricate connections between human activities, the environment, and technology also relating to system resilience and sustainable development.

Krumme (2016) presented the Social-Ecological-Technological Systems (SETS), as a resilience-oriented, system approach to sustainable development. The SETS approach has later been related to nature-based solutions, and McPherson et al. (2022 p. 505) stated that "this complexity [of nature-based solutions] must be understood and managed to ensure ecosystem-service provisioning is effective, equitable, and resilient." McPherson et al. (2022) emphasize that SETS builds on four core challenges associated with urban nature-based solutions: multi-functionality, systemic valuation, scale mismatch of ecosystem services, and inequity and injustice.

Key literature

- Krueger, E. H., Constantino, S. M., Centeno, M. A., et al. (2022). Governing sustainable transformations of urban social-ecological-technological systems. *npj Urban Sustainability, 2*, 10. https://doi.org/10.1038/s42949-022-00053-1
- Krumme, K. (2016). Sustainable development and social-ecological-technological systems (SETS): Resilience as a guiding principle in the urban-industrial nexus. *Journal of Renewable Energy and Sustainable Development, 2*, 70–90. http://dx.doi.org/10.21622/RESD.2016.02.2.070
- McPhearson, T., et al. (2022). A social-ecological-technological systems framework for urban ecosystem services. *One Earth, 5*(5), 505–518. https://doi.org/10.1016/j.oneear.2022.04.007

5.8. Resilience

The United Nation Development Program defines resilience as "systems ability to absorb and recover from chock, while also adapting and transforming to address vulnerabilities", while the Stockholm Resilience Center define resilience as "the capacity to deal with change and continue to develop" (https://www.stockholmresilience.org/research/resilience-dictionary.html). Thus, resilience means the ability to withstand, adapt to, recover from, and overcome disturbances. It includes the capacity to recover, and even grow stronger, after facing a challenge. Therefore, the term encapsulates adaptability, flexibility, redundancy, robustness, and learning from past experiences. The term spans over various context and is not only used when describing environmental systems. It broadly refers to the capacity of systems to endure and grow from challenges, emphasizing adaptability and learning as well as a system's ability to absorb shocks and evolve (Folke et al., 2010).

Key literature

- Folke, C., et al. (2010). Resilience thinking: Integrating resilience, adaptability, and transformability. *Ecology and Society, 15*(4), 20. http://dx.doi.org/10.5751/ES-03610-150420
- Stockholm Resilience Centre. (n.d.). *Resilience dictionary*. Retrieved September 2, 2024, from https://www.stockholmresilience.org/research/resilience-dictionary.html

5.9. Wicked problems

The term Wicked Problems was initially used to describe problems in social planning, and is defined by Rittel & Webber (1973) as "complex and ill-structured problems that are challenging to define, understand, and solve." They contrast wicked problems with "tame" or "well-structured" problems, which are relatively straightforward and can be addressed using traditional problem-solving techniques".

The characteristics of wicked problems include complexity, uncertainty, contradictory viewpoints, no definitive solutions and persistent nature. Solving wicked problems often include acknowledging the limitations of traditional problem-solving and engaging stakeholders in order to explore solutions as it may require collective action (Rittel & Webber, 1973).

<u>Key literature</u>

- Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences, 4*(2), 155–169.

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