

SAK 06 – 2019

**Forskningssamarbeid mellom UiS og NIBIO Særheim.
Søknad om bidrag til finansiering av nyutdannet PhD (post-doc) innen
klimatilpasning og byplanlegging**

Hva saken gjelder

Det har over lengre tid blitt arbeidet for å stimulere til økt samarbeid mellom UiS og forskningsmiljøet ved NIBIO Særheim. Forskningsmiljøet ved Særheim er primært rettet inn imot planteforskning og bio-økonomi. Det har blitt bygget opp et viktig kompetansemiljø innen grøntanlegg med fokus på forskning om etablering, vedlikehold og effekter av blå-grønne arealer som klima og miljøtiltak i urbane sammenhenger. Fagmiljøet for byplanlegging ved UiS har felles forskningsinteresser på flere av de samme temaene.

Forskningsmiljøet ved NIBIO Særheim er relativt lite og har utfordringer med å rekruttere flinke forskere. Et samarbeid med UiS kan bidra til å styrke forskningsmiljøet, samtidig som en ser potensiale for vitenskapelige synergier mellom fagmiljøene på en rekke felt.

Det foreliggende prosjektsamarbeidet vil være rettet inn imot forskning på utfordringer i gjennomføringen av naturbaserte løsninger i byutvikling og klimatilpasninger. Prosjektet skal gå over 3 år og det knyttes en stilling som nyutdannet PhD (post-doc) til prosjektet. Vedlagte prosjektbeskrivelse gir en nærmere omtale av satsingen.

Forskningssamarbeidet mellom UiS og NIBIO Særheim vil forhåpentligvis utvides til å omfatte flere prosjekter i fremtiden, samt samarbeid om undervisning og veiledningsaktivitet og utplassering og praksisarbeid av masterstudenter ved NIBIO.

Vurdering

Det ligger innenfor Universitetsfondets vedtekter og formål å bidra til å bygge opp ulike forsknings- og utdanningsmiljøer i hele Rogaland. Søknaden fra UiS vil bidra til å økt samarbeid mellom fagmiljøer ved Universitetet og miljøet på Særheim innen viktige tema som klimatilpasning, biologisk overvannshåndtering, urban planlegging, mv.

Vi mener dette prosjektet passer godt inn i forhold til satsinger Universitetsfondet skal være med å stimulere blir gjennomført. Det er i tillegg viktig effekt å stimulere til styrking av samarbeidsrelasjonene mellom fagmiljøer i ulike deler av Rogaland.

Det anbefales at styret vedtar en tildeling på kr 3 mill fordelt over 3 år i tråd med det som fremkommer av søknaden.

Forslag til vedtak:

Universitetsfondet bevilger kr 3 mill til forskningssamarbeid mellom UiS og NIBIO avdeling Særheim.

Midlene tildeles UiS og gjennomføres i henhold til prosjektbeskrivelse og budsjett som angitt i søknaden

Vedlegg:

Oppdatert søknad og prosjektbeskrivelse, intensjonsavtale om forskningssamarbeid mellom UiS og NIBIO, CV fra sentrale personer i prosjektet, internasjonale samarbeidsrelasjoner.

Cover letter


Stavanger, 13.05.2019

To Universitetsfondet

ISØP/UiS and NIBIO have worked together to address the comments raised from the steering committee of Universitetsfondet during the last meeting on 21 February 2019. We have improved the introduction of the research, the primary objective and the specific objectives, the methodology, the approach of the study, and the expected outcome of the research. The research proposal also adds the literatures of this research and the research schedule. We also include in the proposal for a strong partnership with international institutions (University of Leeds, Alabama A&M University, and Technical University of Eindhoven). These collaborations and partnerships will allow the PhD candidate and the two supervisors to visit and to make joint research with the overseas universities. The letters of intent are attached in the proposal.

We really hope that this research proposal meets the expectation of the steering committee of Universitetsfondet and ISØP/UiS and NIBIO can get the research grant from Universitetsfondet to execute this research project proposal.

Best regards,



Main supervisor: Associate Professor, Ph.D., Ari Tarigan (UiS)

Second supervisor: Researcher, Dr. scient., Hans Martin Hanslin (NIBIO)

PhD research project:

Green infrastructure for liveable and sustainable cities

A research proposal for an establishment of a research collaboration and joint PhD between the Department of Safety, Economics and Planning (ISØP), University of Stavanger (UiS) and Department of Urban Greening and Environmental Technology, Norwegian Institute of Bioeconomy Research (NIBIO).

1. Concept and aim

Cities confronted with climate change and unsustainable challenges have often considered green infrastructure as one of critical solutions to preserve precious natural resources. The adoption of green infrastructure is argued to promote liveable and sustainable cities, thereby, such infrastructures might help improve human's quality of life, especially under the current era of rapid urban densification, gentrification, auto-mobility, and other expected transformations. A 'green' infrastructure is defined as an infrastructure that, through its design, construction, operation, and maintenance, can contribute on targeting climate change mitigation and sustainable urban development.

The concept of green infrastructure requires a combination of environmental, social and economic functions that blends in harmony on the same spatial area. Green infrastructure may have multifunctionality and each function may contribute to urban ecosystem goods and services. Defining functions, testing whether each function may work properly and how all functions relate one another are critical to ensure the performance of green infrastructure to achieve liveable cities' goals. It is also argued that such functions and their contributions to services can be improved through planning and management. How to quantify such contributions, the interlinkage across the functions and consider 'function' and 'contribution' in urban planning and management is, however, a considerable challenge and will be addressed in this project.

This research aims at extending new knowledge of how the concepts of urban green infrastructures, green nature-based solutions, and ecosystem services can be implemented in urban planning and governance to contribute on creating liveable and sustainable cities, as well as targeting a better quality of life, social cohesion, green economy and climate change adaptation. The study will examine to what extent do green infrastructure interventions produce or, in opposite, somehow challenge the creation of liveable cities.

2. Background

According to the United Nations Millennium Goal, by 2030, one of the targets across global cities is to develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all. The adoption of green infrastructure is highly significant to address this 2030 UN Millennium Goal. A number of features which can contribute to green infrastructure are for instance: 1) efficient use of energy, water and other resources, 2) use of renewable energy, such as solar, wind and hydro energy, 3) pollution and waste reduction measures, and the enabling of re-use and recycling of water and other organic components, 4) use of materials that are non-toxic, ethical and sustainable, 5) consideration of the environment in design, construction and operation of physical infrastructures, 6) consideration of the quality of life of occupants in design, construction and operation of physical infrastructures, and 7) a design that enables adaptation to a changing environment. Any infrastructure can be a green infrastructure, however, the fact is that not all infrastructures were built up as 'green' infrastructures.

The existence of green spaces is critical for ensuring the creation of liveable cities for all people (e.g., UN Habitat, 2007, 2009). The multi-functionality of green spaces as well as the connectivity between green spaces and the built environment are important factors in making sustainable urban development (Mellqvist et al., 2016). Evidence indicates that industrialization and urbanization have played a vital role to transform agricultural, natural and semi-natural land-use to residential and industrial areas followed by a considerable urban sprawl and development of extensive transportation infrastructure. Low quality and decreasing share of green space and the extensive fragmentation of green space within and around urban areas are ramifications that have existed in many cities over the past few decades. These transformations have a negative impact on the delivery of urban ecosystem goods and services such as recreation, aesthetics, air quality, stormwater management, biodiversity, etc., changes that in turn affects the quality of life. Thus, the need for integrated strategic planning of urban green spaces and how these can contribute to health, quality of life and economic growth in cities has long been recognized and further reinforced with the need for urban climate adaptation.

Over the last 20 years, we have seen new concepts develop of which urban (blue-) green infrastructure (GI) and ecosystem services (ESS) have made the most significant contributions to urban policy-making. The most recent concept, Nature-based solutions (NBS), tends to integrate several of these initiatives and rest on the use of natural processes to handle major challenges as climate change, food security, water resources, and disaster risk management

(Pauleit et al. 2017). At present, approaches based on GI and ESS are the most powerful to address the core principles of **quality** of green areas, **integration** of green and grey infrastructures, **multifunctionality** with delivery of multiple functions and ecosystem services, **connectivity** bridging nodes and functions in the green structure and **social inclusion** with collaborative and participatory planning (Hansen et al. 2017).

The multifunctionality principle of green infrastructure refers to the ability to utilize multiple ecological, social, cultural, and economic functions and provide several benefits on the same spatial area (Pauleit et al. 2011). The ecological function refers to biodiversity conservation or climate change adaptation. The social function relates to the provision of water drainage or green space, and the economic function may indicate how to supply jobs and raise property prices. For example, the installation of a conventional roof may be designed for one function only, which is for the building protection from rainfall. On the other hand, the new form of green roof may provide the combination of environmental, social, and economic functions like reducing storm water runoff and the pollutant load of the water, decreasing the urban heat effect, improving the insulation of the building and providing habitat for a variety of species.

The adoption of the green infrastructure and ecosystem services as part of urban development strategies is necessary to restore cities to natural and cultural heritage as well as return the green identity of the urban landscapes. The green structure here refers to a spatial network that links open spaces, public and private gardens, public parks, sports fields, allotment gardens and recreation grounds within the city to the networks of nature such as woodlands and river floodplains. The green structure offers a platform for a city to gain multi-function roles, acting as, for example, playgrounds, lawns and greens, picnic sites, trails and greenways. The adoption of the green structure should ensure the integration of the built environment and natural spaces. Green zones along rivers, for example, may perform multi-function roles, such as routes for walkers and cyclists, floodplains for water management, ecological corridors for wildlife and attractive edges for residential development. Private gardens can even become part of the green structure in moderating the urban climate and in creating comfort conditions for biodiversity. Urban greening such as trees and green open spaces, is widely acknowledged to provide various benefits, such as increased mental and physical health, reduction of heat island effect, and protecting biodiversity. The green structure further encourages active travels like cycling and walking, by creating green, pleasing, and esthetical paths that are part of ecological corridors for wildlife. Green infrastructure seems to be in the front line that can prevent and

mitigate negative environmental impacts of automobile dependency, and potentially facilitate alternative modes of travel, such as walking and biking.

According to past studies, the green structure characteristics can be based on five variables: landscape proportion, aggregation, fragmentation, patch distance, and the largest patch percentage (Leitão et al., 2006; McGarigal and Marks, 1995; Shen and Lung, 2016; 2018). This approach neatly bridges the fields of landscape architecture and landscape ecology. In addition to the green structure elements, several factors can also be critical to ensure the creation of liveable cities such as atmospheric environments (i.e. air pollution and temperature), urban form, and socio-demographic conditions (Shen and Lung, 2016; 2018).

3. Core research questions

The implementation of NBS is still in an early phase and central knowledge gaps have to be addressed to develop a scientific sound and evidence-based approach. This especially applies to multifunctionality and co-benefits of NBS and GI as well as the effectiveness of NBS and ESS interventions to push the cities to be more liveable and sustainable. Driven by the above-mentioned overview, the conceptual research questions are proposed as follow:

- a) How can we develop relevant and efficient methods to describe and analyse multifunctionality and co-benefits across urban typologies and green infrastructures as tools for urban planning and management?
- b) How can indicators of ESS, NBS, and GI be operationalized for monitoring and targeted for the quality of urban green areas and current challenges in urban planning and development, including sustainable mobility, climate-change adaptation, sustainable built environment, and public health?
- c) How does the integration exist across green and grey urban infrastructures and whether connectivity has been occurred in bridging nodes and functions in the green structure?
- d) How can trade-offs and uncertainties in functions and effectiveness at different spatial scales be handled in adopting the green structure as tool to address challenges in urban development and physical planning?

4. Objectives

The primary research objective is to examine regarding to what extend do green infrastructure interventions produce or, in opposite, somehow challenge the creation of liveable and sustainable cities. This research consists of six specific objectives. The first research

objective is to conduct a meta-analysis study based on international literatures. It will review the all possible indicators for urban ecosystem services and multifunctionality using established methods and protocols (Pickering & Byrne, 2014; Pickering et al., 2015). The research will adopt the PRISMA method¹, a transparent reporting of systematic reviews and meta-analyses, to discuss the review of the literatures.

Secondly, this research project will develop and test candidate scalable approaches and indicator sets for quantification of ESS and multifunctionality of urban green areas based on a set of spatial analysis, utilising a combination of remote sensing, sensor networks and fieldwork for defined neighbourhoods and spatial scales.

Third, the research project will apply the best performing indicators in a number of urban green areas and combine with indicators of different types of urban areas, vegetation structure, soil conditions, landscape ecology (connectivity, patch size, matrix quality) and consider cultural, social and economic factors to model dependencies and constraints using both multivariate and Geographic Information System (GIS)–based approaches.

Fourth, the research project will develop a questionnaire and an online-based survey about public attitudes, preferences, support, and opinions regarding the adoption of green infrastructures as part of urban greening and how these impact their behaviour on utilising and perceiving public spaces and facilities. We will use this dataset to conduct a set of quantitative analyses (e.g. multivariate analysis, structural equation analysis, and discrete choice analysis) to uncover public responses towards the green infrastructures and their preferences to respond the given strategies proposed by the authorities in creating urban greening. The study in particular will explore how green-based building design, built environment, and landscape can positively contribute to improve happiness, mental health and satisfactions of urban residents towards the urban infrastructure elements. The results from this objective will be critical as a starting point for policy makers to create inclusive and sustainable policies towards green infrastructure development in cities.

Sixth, we will study the possible link between green infrastructures and the concepts of place attachment and sense of place. Place identity is largely related to the concepts of community formation, because it recognizes that geographical spaces do not solely bond a community together but rather there are social bonds that account for community formation. Those social forces often are feelings of belonging and security, which involve theoretical formations of community. Place identity is likely formed by similar locality, culture, and/or

¹ <http://www.prisma-statement.org/>

experiences. This study elaborates how urban greening is crucial to determine own identities and strengthen their bonds within their community.

5. Methods

Data analysed in this research project will be collected through a combination of qualitative and quantitative approach. A set of workshop, semi structured interview and focus group discussion and questionnaire-based survey with will be carried out to investigate stakeholder perceptions towards the adoption of indicator based planning, monitoring and management of nature-based solutions given their dynamic nature and requirements for adaptive management. This research will be strengthened by document-based analyses. The research will find out the availability and quality of open spatial data with sufficient spatial resolution and quality. Such sources are needed for the spatial analysis and may suggest new strategies for monitoring or automated analyses. This spatial data will be used to test methods for visualisation of ESS and multifunctionality in GIS solutions and dashboards, including constraints on key functions. Behaviour mapping method will be executed to determine how participants use a designed space by recording participant behaviours and/or tracking participant movement within the space itself. A set of econometric analysis will be applied to explain individual perceptions, attitudes, and behaviours to the existence of green infrastructures in their neighbourhoods. In particular, choice modelling will be employed to model the decision process of an individual or segment via revealed preferences or stated preferences made in a particular context or contexts. The model will consider utility maximization, optimization approach to consumer theory, and other identification strategies to estimate users' willingness to use and pay the green infrastructures. In addition, a set of statistical analysis will be employed to statistically test the variability and the similarity of people behaviour, support, and opinions to the adoption of green infrastructure, considering gender, age, income, and other social factors.

6. Expected outcomes

Project results will be disseminated through: 1) a set of minimum 5-6 scientific papers submitted to high quality journals in the field of urban planning and design, sustainability, built environment, and environmental policy; 2) knowledge transfer to regional and national stakeholders through meetings and seminars; 3) presentations at international conferences, and

partnership in research with international experts and institutions, and 4) disseminations the results through popular magazines and social medias. This dissemination will contribute to the understanding of the linkages between liveable cities and green structure planning and urban development factors, and contribute to a general toolbox for improved planning and targeted management. The concepts and results will be embedded in teaching at UiS and will provide a platform for continued co-operation between UiS, NIBIO and international partners. The project will provide a platform to strengthen/support the initiatives of local municipalities and Rogaland County towards sustainable and liveable development at city and regional level, and has the potential for significant contributions to development at national and European level.

7. Research team

This research project will involve a new PhD researcher, who will be hired as a temporal employee for three years (100%) at the department of safety, economics, and planning (ISØP), University of Stavanger. To ensure the quality of research, the PhD researcher will be supervised by experts in the field of regional and city planning from UiS and sustainable environment from NIBIO. The PhD research will be also mentored by experts from the combination of industry (Rambøll), academia (UiS), research institution (NIBIO) and international partners. The core research members can presented as follow:

Supervisors:

Main supervisor: Associate Professor, Ph.D., Ari Tarigan (UiS)

Second supervisor: Researcher, Dr. scient., Hans Martin Hanslin (NIBIO)

Reference groups:

- Anne Merethe Skogland (Rambøll)
- Professor Harald Nils Røstvik (UiS)
- Associate Professor Daniela Müller-Eie (UiS)
- Research Professor Arne Sæbø (NIBIO)

8. International collaboration

This research project will promote a collaboration with international partners to gain global perspectives and academia advices about the issue. The PhD research may select few of the partners to carry out short-term research stay to strengthen the research and undertake some relevant courses as part of the requirement of the PhD research. The partners from Leeds

University (UK), Alabama A&M University (USA), and Technical University of Eindhoven (Netherlands) have shown their strong commitment and interest to contribute in many different ways to ensure the successful rate of this research project (the intent letters attached). The institutions include:

1. Professor Job Lovett², Professor and Chair of Global Challenges, School of Geography, Faculty of Environment, Leeds University, Leeds, UK. (J.Lovett@leeds.ac.uk).
2. Professor Deden Rukmana³, Professor and Chair, Department of Community and Regional Planning, Alabama A&M University, Alabama, USA (email: Deden.Rukmana@aamu.edu).
3. Professor Dr. Ir. Pieter van Wesemael⁴, Professor of Urbanism and Urban Architecture, Department of the Built Environment, Technical University of Eindhoven, Eindhoven, Netherlands (email: p.j.v.v.wesemael@tue.nl).

9. Context of research

This research project is in line with the existing research activities in ISØP and NIBIO and will combine complementary expertise from both institutions. In cooperation with Stavanger Kommune, NIBIO recently completed a project “*Robust and sustainable communities*” funded by RFF Vestlandet on stormwater management. NIBIO also has been running a strategic institute program «*Grønne byer: Multifunksjonelle grøntmiljø for å begrense forurensninger og flommer i byer og tettsteder*», which is funded by NFR, and takes part in an action Urban Agenda for EU: “*Sustainable Use of Land and Nature-based Solutions Partnership*” that is led by Stavanger Kommune. In parallel, the regional and city planning group at UiS has several ongoing projects. The most recent project is *Smart Cities* which is funded by UiS and the group has been selected as the hub for smart cities network for bridging research groups at UiS and local and regional industries. Under the smart cities project, new 5 PhD researchers will start their project from autumn 2019. We are confident that the research project proposed here can be well connected with the UiS’s Smart Cities Project and to collaborate in gaining robust and high quality of research results.

² <https://environment.leeds.ac.uk/geography/staff/1066/professor-jon-lovett>

³ <http://www.aamu.edu/academics/colleges/agricultural-life-natural-sciences/departments/community-regional-planning/>

⁴ <https://www.tue.nl/en/research/researchers/pieter-van-wesemael/>

The research questions of this research project directly address regional challenges, initiatives, and actions. The results of the research project may impact to research and practices, helping the local society in Rogaland. This research may select Greater Stavanger as the object of the study with a possibility to carry out a comparative study with other national and international cities. In particular, we plan to collaborate with experts from the Geodata group at Stavanger Kommune and Smart City actions in the region.

10. Finance

The total budget for the three years is MNOK 3,817 million, split into the following:

- a) NRC level annual cost of PhD Researcher NOK 1,095 million (2019) plus 1,125 (2020) and 1,156 (2022). In sum NOK 3,376 million.
- b) Mobility expenses three months study abroad at NOK 18,000 per month according to UiS cost level for single person and NOK 33,000 for family. In sum NOK 99,000.
- c) Tutoring/supervision 120 hours a year (90 hours for main supervisor and 30 hours for co-supervisor). At NOK 700 and for three years (360 hours) this will be NOK 252,000.
- d) PhD defence costs of NOK 90,000.

We propose the following contributions to cover the total budget in NOK million:

- Salary/operational costs of PhD. Contribution from University Fund	MNOK 3,000
- Other external sources or TN UiS, ISØP (3,376-3,000)	MNOK 0,376
- Tutoring/supervision. In kind contribution from UiS ISØP	MNOK 0,189
- Tutoring/supervision. In kind contribution from NIBIO	MNOK 0,063
- Mobility funding. Other external sources or UiS TN	MNOK 0,099
- PhD Defence UiS TN Faculty	MNOK 0,090
SUM	<u>MNOK 3,817</u>

UiS/ISØP and NIBIO hereby guarantees the coverage of the costs above The University Fund's possible contribution of MNOK 3,000 (78%), equivalent to MNOK 0, 817 (22%).

11. Schedule

Table 1 illustrate the overview of the project schedule. The kick off of this research study is planned in the early autumn 2019. The PhD researcher will be recruited around September 2019 and will start the project from January 2020. The research activity that involves

the PhD researcher will be divided into six research activities, in which will be executed for three years from January 2020 until December 2022. The data collection will be carried as early as possible since the research project is officially launched and when the PhD researcher is officially recruited in the project. An optional activity to visit an overseas institution is allocated in the schedule in which around 2021. The research project will start to disseminate the results of the work from 2021 until the end of the project through conferences, workshops, and other tools. The PhD defence is planned in the second semester of 2022.

Table 1. The research activity schedule

Activity item	2019		2020		2021		2022		2023
	1-6	7-12	1-6	7-12	1-6	7-12	1-6	7-12	1-6
Research proposal development									
PhD recruitment process									
PhD Research									
Data collection									
Overseas research stay									
International Conference									
National Conference									
Writing peer-reviewed articles									
PhD defence									

References

- Caspersen, O.H., Olafsson, A.S. (2010). Recreational mapping and planning for enlargement of the green structure in greater Copenhagen. *Urban Forestry & Urban Greening* 9 (2), pp. 101-112.
- Hansen, R., Rall, E., Chapman, E., Rolf, W., Pauleit, S. (eds., 2017). *Urban Green Infrastructure Planning: A Guide for Practitioners*. GREEN SURGE. Retrieved from <http://greensurge.eu/working-packages/wp5/>
- Jensen M.B., Persson, B., Guldager, S., Reeh, U., Nilsson, K. (2000), Green structure and sustainability – developing a tool for local planning, *Landscape and Urban Planning* 52, pp. 111- 133.
- Leitão, A.B., Miller, J., Ahern, J. (2006). *Measuring Landscapes: A Planner's Handbook*. Island Press, Washington, DC, USA.
- Madureira, H., Andresen, T., Monteiro, A. (2011). Green structure and planning evolution in Porto, *Urban Forestry & Urban Greening*, 10 (2), 141-149.
- McGarigal, K., Marks, B. J. (1995) FRAGSTATS: Spatial Pattern Analysis Program for Quantifying Landscape Structure, Station, P.N.R. (Ed.). USDA Forest Technique Report,

- Portland, USA.
- Mellqvist, H., Kristensen L.S., Van den Bosch, C.K. (2016). Participatory green structure planning for linking urban and rural landscapes – A case study from Ronnby, Sweden, *Nordic Journal of Architectural research*, Issue 3.
- Pauleit S, Zölch T, Hansen R, Randrup TB, van den Bosch CK. (2017). Nature-Based Solutions and Climate Change –Four Shades of Green. IN. Kabisch et al. (eds.), *Nature-based Solutions to Climate Change Adaptation in Urban Areas, Theory and Practice of Urban Sustainability Transitions*, DOI 10.1007/978-3-319-56091-5_3
- Pauleit, S., L. Liu, J. Ahern, and A. Kazmierczak (2011). Multifunctional green infrastructure planning to promote ecological services in the city. In *Urban ecology. Patterns, processes, and applications*, ed. J. Niemelä, 272–285. Oxford: Oxford University Press.
- Shen Y. S., Lung, S.C.C. (2016). Can green structure reduce the mortality of cardiovascular diseases? *Science of The Total Environment*, Volumes 566–567, pp. 1159-1167.
- Shen Y.S., Lung, S.C (2018). Identifying critical green structure characteristics for reducing the suicide rate, *Urban Forestry & Urban Greening* 34, 147-153.
- Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kazmierczak, A., Niemela, J., et al. (2007). Promoting ecosystem and human health in urban areas using green infrastructure: a literature review. *Landscape and Urban Planning* 81, 167–178.
- UN Habitat (2007). *State of the World's Cities 2006/7* (Press Kit). Retrieved December 10th, 2018, from <http://www.unhabitat.org>.
- UN Habitat (2009). *Planning Sustainable Cities: Global Report on Human Settlements 2009*. Retrieved December 10th, 2018, from <http://www.unhabitat.org>.
- Undholm, G. (undated). «Green structure» as activity and as object - implications for urban planning. Source: <http://arkitekturforskning.net/na/article/viewFile/511/459>.
- Pickering, C.M. and Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early career researchers. *Higher Education Research and Development*. 33: 534-548
- Pickering, C., Grignon, J., Steven, R., Guitart, D., Byrne, J. (2015). Publishing not perishing: how research students transition from novice to knowledgeable using systematic quantitative literature reviews. *Studies in Higher Education* 40: 1756-1769.

Til Universitetsfondet

Forskningssamarbeid mellom UiS og NIBIO avdeling for grøntanlegg og miljøteknologi

Fagmiljøet for Byplanlegging ved UiS og fagmiljøet for Grøntanlegg ved NIBIO har felles forskningsinteresser innenfor etablering, restaurering og vedlikehold av urbane blå-grønne arealer og deres betydning for trivsel, helse og miljø. Særlig en integrering av byplanteori og planpraksis med miljøfag ses på som givende og et godt grunnlag for faglige synergier. Det foreslås derfor å etablere et forskningssamarbeid mellom Institutt for Sikkerhet, Økonomi, og Planlegging (ISØP) ved Universitetet i Stavanger og Avdelingen for Grøntanlegg og Miljøteknologi ved Norsk institutt for bioøkonomi (NIBIO).

Strategiske mål

Målet med samarbeidet er å utvikle en plattform for vitenskapelige synergier mellom fagmiljøene som sikter på produksjon av fremragende forskning innen lokale og globale utfordringer med klimatilpasning, urban planlegging og overvannshåndtering. Dette passer godt inn i våre strategier om fokus på bærekraft, og smartbyer. I første omgang skal det utvikles et felles PhD prosjekt som tar for seg akutte utfordringer i gjennomføringen av naturbaserte løsninger i byutvikling og klimatilpasning. Denne vinklingen bygger på pågående FoU aktivitet og er et viktig steg for forankring og implementering av slike løsninger hos kommunene. Våre internasjonale nettverk vil bli brukt for å forankre forskningsspørsmålene i forskningsfronten. Plattformen vil videre lede til et langsiktig og gjensidig partnerskap mellom begge fagmiljøene, der også nye partnere kan tilknyttes.

Videre samarbeid

Forskningssamarbeidet kan videre bidra med å generere aktuell og relevant kunnskap om miljøtiltak, klimatilpasninger, CO₂ reduksjon. Dessuten vil forskningen fremme smartby-konseptet og gode levekår i byer. Forskingen vil være på et internasjonalt fremragende nivå, og kan testes og anvendes i lokal og regional sammenheng i byutviklingsprosjekter og planarbeid. Dette inkluderer et tett samarbeid med kommunene og andre interessenter i regionen.

Andre tema som kan inngå i samarbeidet er


- Utvikling av urban landbruk for kortreist matproduksjon og som sosial arena
- Bruk av blå-grønn faktor i arealplanlegging
- Overvannshåndtering som en integrert del av grøntstrukturen
- Bruk av indikatorer og prioritering av økosystemtjenester for målrettet forvaltning av grøntarealer

Samarbeidet kan utvides til å omfatte undervisnings- og veiledningsaktivitet, der relevante spørsmål utforskes gjennom studentprosjekter. Det kan også være muligheter for å samarbeide om utplassering og praksisarbeid av masterstudenter ved NIBIO.

Sted/Dato


Tore Markeset
Instituttleder ISØP

Sted/Dato As 28.01.2019


Hakon Borch
Avdelingsleder Grøntanlegg og Miljøteknologi