INSTRUCTIONS FOR DRAFTING YOUR FULL PROPOSAL

Full Proposals in this call must be submitted electronically, using the electronic submission service accessible from the call page: Joint Call 2018 or access it directly via Submission platform hosted by ANR

A Full Proposal is composed by the following parts:

Part A: Partners participation and budgets, you can edit the information you have submitted in the step 1 including uploading of revised CVs and budget excel-file.

Part B: Pre-proposal that was already submitted in the step 1. Part B will be replaced by Part C.

Part C: Full proposal must be submitted by the Consortium Coordinator in the submission platform before 18 September 2018 at 17.00 CEST.

This instruction aims at providing you with:

(i) information on how to edit the Part A;
(ii) information on how to complete the Part C;
(iii) some practical notes;
(iv) the template you must use to submit your full proposal; and
(v) a checklist you should go through before you submit your full proposal.

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HOW TO EDIT PART A

Partners considered not eligible in Step 1 should **either** be deleted from the list of Consortium members and their tasks reassigned within the consortium **or** be allowed to collaborate at their own expenses (in this case there should be no requested funding associated with them). The project budget must be adjusted accordingly (**no** additional funding should be requested).

Please, also revise the budget excel-file with the correct figures – note that they must be the same as put into the submission platform – and **upload the budget excel-file into the submission platform**.

The coordinator must check that all CVs attached to Part A respect the **one-page limit. Only the first page of the CV will be evaluated.**

HOW TO COMPLETE PART C (conform to the instructions and layout described here)

Part C of the proposal contains the details of the proposed research and collaborative efforts. At the full proposal stage, applicants will now include the practical arrangements planned to implement them, which will be evaluated by independent experts.

Applicants must structure their proposal following the full proposal template provided in the next pages. Please note that the explanatory notes (in blue) serve to provide a description of what is required in the various sections of the full proposal without being exhaustive. (Please, exclude the notes, in blue and red when writing your proposal).

Applicants must ensure that their full proposals conform to the layout and to the instructions given on this page, and to the instructions provided in the various sections.

The maximum total length of sections 1 to 3 of Part C of the full proposal is 15 pages.

There is no page limit for the individual sections of Part C. **Within the 15-page limit**, applicants are therefore free to decide on the length dedicated to each section, and should not be influenced by the length of the explanatory notes given on each section.

Sections 4 and 5 of Part C of the full proposal have a specific page limit, dependent on the consortium size – the page limits are indicated in the template.

The page size is ISO **A4**, and all **margins** (top, bottom, left, and right) should be at least **15 mm** (excluding footers or headers). This document has the correct format and font. Use this as your starting document and delete where appropriate.

Use the same font and style for the whole proposal (Times New Roman, 11 pt, single spacing, black colour).

Literature references should be listed in footnotes, font size 9. However, regardless of the format used, all footnotes will count towards the page limit.

Please make sure that the **Part C of your proposal carries a header to each page the proposal acronym.** All pages should be numbered in a single series on the footer of the page to prevent errors during handling. It is recommended that the numbering format "**Page X of Y**" is used.

At the end of this document you will find a checklist. Please make sure that the document (and the remaining of your proposal documentation) is in accordance with all of those points.

Proposals not meeting the abovementioned requirements will not be evaluated.

PRACTICAL NOTES:

- Please take into consideration that applicants will be evaluated based on three different criteria: Scientific Excellence, Impact and Implementation. The three criteria carry the same weight.
- Please remember that it is your responsibility to comply with the page limit and all other formal eligibility requirements.

Part C

WATER JOINT PROGRAMMING INITIATIVE

WATER CHALLENGES FOR A CHANGING WORLD

2018 JOINT CALL
Closing the Water Cycle Gap

"NATURE-BASED SOLUTIONS FOR WATER MANAGEMENT IN THE PERIURBAN: LINKING ECOLOGICAL, SOCIAL, AND ECONOMIC DIMENSIONS"

"NATWIP"

1. EXCELLENCE

1.1. Introduction

In the recent years, the European Commission has devoted considerable attention to Nature-Based Solutions (NBS) as a way forward for achieving sustainable development in the region. At the global scale too, NBSs are being promoted and increasingly applied to guide the way towards reaching the sustainable development goals (SDGs) with beneficial outcomes for environment, economy and society[1]. NBS are defined as "actions which are inspired by, supported by or copied from nature"[2] & therefore encapsulate *inter alia* green infrastructure, blue infrastructure & biomimicry as tools for ecologically sensitive urban development. A NBS can involve conserving or rehabilitating natural ecosystems and/or the enhancement or creation of natural processes in modified or artificial ecosystems. They can be applied at micro- (e.g. within household) or macro- (e.g. landscape) scales[3]. NBS are seen to deliver multiple benefits including sustainable urbanization. The foremost sector foreseen to be benefited from NBS is water, particularly in achieving progress towards sustainable human settlements, access to water supply & sanitation services, enhanced food production, & water-related disaster risk reduction. They are also seen to be important for climate response in relation to water in terms of availability as well as quality challenges[4].

Considerable attention is currently focused on promoting & applying NBS in the urban context[5]. However, the focus remains on urban core while the peri-urban areas, that are transition spaces often affected by expansion processes of the city, remain under-explored. Peri-urban areas may be originally large 'green' open spaces such as woodlands, farmlands & nature reserves in the urban periphery, & include 'blue' spaces like river, riversides & waterfronts. These have historically played important role in development & sustenance of urban centres, provision of water-related ecosystem services, particularly water supply, wastewater management & flood control. However, with urban expansion, as natural environments get increasingly replaced by 'built' environment, the resources contained within these get increasingly shared. In the EU, the expanse of built 'artificial surfaces' lying in areas classed as 'peri-urban' & 'urban' is almost the same, around 48,000 sq.km.[6] Erosion of natural environments leads to disruption of ecosystem services, causing water challenges regarding both quantity & quality. These challenges lead to critical water cycle gaps which affect the urban core as well as peripheries[7].

There is need to find sustainable solutions for these gaps as reflected by the 2030 Agenda for Sustainable Development and the SDG 6, ("Ensure availability and sustainable management of water and sanitation for all"). Towards this end, there is need to explore at length the potentials and appropriateness of NBS in the peri-urban, looking at the added value these can bring in comparison to the conventional engineering solutions, as also assess the requisite socio-economic-policy contexts that their adoption/implementation would require. The importance of NBS is worded in Target 6.6 of the SDGs which states: "By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes" to support the achievement of SDG 6. This project aims to contribute to closing the water cycle gap in the peri-urban areas in Europe by building shared knowledge on NBS based within and outside the European context.

1.2. State-of-the-art and relation to the work programme

State-of-the-art:

Recently, the EU developed a Research & Innovation (R&I) agenda on NBS to include re-naturing cities and territorial resilience[8]. The agenda builds on a wealth of knowledge from previous EU Framework Programmes and policy initiatives to include blue-green infrastructure, biodiversity and ecosystems, sustainable urban development, natural resources management, climate change mitigation & adaptation, & disaster risk reduction. In this context,

[1] Faivre et al. 2017. Nature-Based Solutions in the EU: Innovating with nature to address social, economic and environmental challenges. *Environmental Research,* 159: 509-518.

[2] EU 2015. *Towards an EU Research and Innovation policy agenda for Nature-Based Solutions & Re-Naturing Cities*. D-G of R&I, EU.

[3] WWAP/UN-Water. 2018. *The United Nations World Water Development Report 2018: Nature-Based Solutions for Water*.Paris, UNESCO

[4] WWAP/UN-Water. 2018. Ibid.

[5] Lafortezza et al. 2018. Nature-based solutions for resilient landscapes and cities. *Environmental Research,* 165: 432-441.

[6] Piorr A. et al. 2011. *Peri-urbanisation in Europe: Towards a European Policy to sustain Urban-Rural Futures*. University of Copenhagen.

[7] Piorr A. et al. 2011, Ibid.

[8] EU (2015): Towards an EU Research and Innovation policy agenda for Nature-Based Solutions & Re-Naturing Cities Final Report of the Horizon 2020 Expert Group on 'NBS and Re-Naturing Cities.' D-G of R&I.

NBS are defined as solutions that are "inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience"[9]. Since NBS address a variety of societal challenges in sustainable ways, they are expected to contribute to green growth and citizen well-being, as well as provide business opportunities for positioning Europe as a driving force internationally. Furthermore, NBS contribute to the implementation of the broader EU policies of the Water Framework Directive[10] and the Floods Directive[11] as well as the UN's Sustainable Development Goals.[12] NBS have emerged as science-policy-practice interface. One of the NBS´ key attractions is their multi- functionality as blue-green infrastructure can perform a number of functions and provide several co-benefits for the same spatial area. These functions can be ecological, social, or economic which also are mirrored in ecosystem services.

The European Commission's Expert Group on 'Nature-Based Solutions and Re-Naturing Cities' emphasizes that NBS represent an effective, resource-efficient and flexible approach compared to traditional engineering approaches. Ongoing research also shows that in many cases, blue-green infrastructure solutions are less expensive than grey infrastructure, and can benefit the local economy, the community and the environment. There is, however, a general perception among stakeholders and decision-makers that, while NBSs are often quite affordable and have positive additional consequences for ecosystem services, they are not as effective as conventional grey infrastructure at reducing the impact of hazards[13]. The co-benefits offered by NBS in general & for water in particular in the urban context have been concluded by several researches, sometimes comparisons have also been drawn with the conventional engineering-based approaches.[14]Also, its implications for science, policy and practice in the European context have been discussed.[15]

Despite the increasing interest in scientific explorations on NBS in general, and for water in the urban contexts in particular, the state of the art shows certain weaknesses: first, an unequal focus on the peri-urban where NBS for water were historically strong but have increasingly come to be most impacted by urbanization; second, lack of multidisciplinary explorations of NBS as a concept and practice; & third, absence of a generalized integrated tool whereby the added value offered by NBS for water and its feasibility vis-a-vis conventional engineering solutions can be assessed in any given context. The value of NBS for sustainability and its feasibility is, of course, dependent upon the contextual factors for every case, and its large-scale adoption by planners and other actors would very much depend upon a clear understanding of the same.

There is thus a need to advance knowledge on how NBS for water, with a focus on the peri-urban, can be assessed on different sustainability parameters and how NBS can be increasingly adopted within urban development practices. This proposal moves beyond the state of the art by taking a systemic perspective on NBS for water, with emphasis on complexity, uncertainty, resilience and adaptation for different peri-urban contexts. It focuses on the need to ensure the involvement of multiple stakeholders and combine multi and transdisciplinary knowledge as key elements in the implementation and assessment of NBSs[16] as local responses with replicability´ potential, helping make progress from a sectoral policy towards a new urban management paradigm.

Relation to the Work Programme:

The project is directly related to **Theme 2** of the Call on "Strengthening Socio-economic Approaches to Water Management". It aims to develop & share knowledge on NBS for addressing challenges confronting the water cycle in peri-urban areas, with significant direct implications for the urban core areas as well. NBS for water have been envisaged as central to achieving the 2030 Agenda for Sustainable Development because these are rooted in integrated approaches & generate social, economic & environmental co-benefits, including in the fields of human health & livelihoods, food & energy security, sustainable economic growth, decent jobs, ecosystem rehabilitation &

[9] (EU, 2015)

[10] EC (2000): EC, 2000, Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (http://eur-lex.europa.eu/LexUriServ/LexUriServ).

[11] EC (2007): EC, 2007a, Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (Text with EEA relevance) (http:// eur-lex.europa.eu/LexUriServ/LexUriServ).

[12] UN (2016): Progress towards the Sustainable Development Goals. Report of the Secretary-General. E/2016/75, 3 June 2016.

[13] EU (2015), Ibid.

[14] For e.g. Eggermont, H., et al. 2015. NBS: new influence for environmental management and research in Europe. *Gaia* 24 (4), 243–248.

[15] For e.g. Nesshöver, C. et al. 2017. The science, policy & practice of NBS: An interdisciplinary perspective. *Sci. of the Total Env.*, 579.

[16] Cohen-Sachcham, E. et al. 2016. (Eds). Nature-Based Solutions to Address Global Societal Challenges. IUCN, Switzerland.

maintenance, & biodiversity. It is argued that the substantial value of these co-benefits can tip investment decisions in favor of NBS. Further, effective implementation of NBS involves the participation of many different stakeholders including those at local level. It should thus encourage consensus-building & help raise social awareness about why & how to adopt NBSs to improve water security.

Regarding Sub-theme 2.1 – "Integrating economic and social analyses into decision-making processes", the project aims to develop decision-support tools towards selection of sustainable solutions for closing the water cycle gap. These tools would be in the form of 1) an innovative multi-dimensional methodological framework to assess NBS along the 3 axes of sustainable development, namely, economic, social & ecological - incorporating ecological, socio-economic, policy, planning, governance, institutional perspectives; 2) comparative evidence-based narratives summarizing the potentials, benefits & processes for dealing with water challenges specific to peri-urban areas using NBS; 3) best practices guidelines & policy recommendations for adopting and promoting NBS for resolving water cycle gaps in the peri-urban. These tools will draw upon not only cases from the European context, but also international experiences which will be widely shared with diverse stakeholders. Moreover, through promotion of NBS the project findings would promote a circular economy as well as a blue-green economy where more efficient water management through naturally-oriented water cycle will be combined with green infrastructure to promote socio-economic development involving all stakeholders in the peri-urban spaces. It would also support implementation of the EU Water Framework Directive (WFD) where improvement of water quality – surface and ground - is the central concern, alongside issues of water availability. **Regarding Sub-theme 2.3** – "Connecting science to society". This project would enhance the knowledge of stakeholders regarding different forms & feasibility of NBSs for addressing peri-urban water challenges, defining ways & means for enhancing their acceptance & their incorporation within policy & action instruments. The range of stakeholders in focus includes: i) researchers, scientists and research organisations dealing with water, environment and development; ii) policy makers; iii) agencies concerned with water, environment & planning; iv) local governments responsible for Ecosystem Services; v) NGOs; vi) companies/industries using or impacting water; vii) farmers & landowners; viii) general public. In general, it would enhance public awareness on water challenges as well as the importance & scope of their participation in activities concerning sustainable water management through NBS. It would also enhance their awareness about the socio-economic value of nature & eco-systems for human development, in turn sensitizing them & stimulating desirable behavior among masses.

The project is also related to **Theme 3** – "Supporting tools for sustainable integrative management of water resources", since NBS itself is an integrated approach that helps connect blue and green infrastructures in an area. Through an innovative trans-disciplinary methodological framework & best practices emerging from analysis of case studies located across different nations within & outside the European context, the research would provide supporting tools to promote NBS in the peri-urban as a means for sustainable integrative water management.

1.3. Objectives and overview of the proposal

NATWIP will contribute to closing the water cycle gap by exploring the potential that NBS offer to address water management challenges in landscape areas that have been neglected because they lie in the transition zones between the urban and the rural, commonly referred to as peri-urban areas. The overall purpose is to exchange learning experiences among the partnership and promote the debate between science and society in order to increase awareness among practitioners and users on the application of NBS to manage different hydrological challenges such as water scarcity, pollution, and risks related to extreme events like flood and drought. The specific objectives are as follows:

1. Review international experiences to identify barriers, lessons learned and challenges in the implementation of different NBS to deal with water management in the periurban.
2. Establish a methodological framework as a tool to analyse the potentials, content and benefits of NBS in the peri-urban context, considered from ecological, socio-economic, technological, policy, planning, governance, institutional perspectives, and including different types of stakeholders (authorities, administrators, associations, scientists and the public).
3. Apply the methodological framework to conduct an analysis at a number of case study sites to:
   - complete a scenario study to identify the main challenges for implementing different forms of NBS in the peri-urban (from ecological, socio-economic, political, planning, governance, institutional perspectives);
   - compare situations in the different case study sites to draw generalizations at the pan-European level, including some comparisons of NBSs with more conventional solutions;

- reflect on the overall socio-economic-policy and governance context that would favor the implementation of NBS in the peri-urban context.

4. Create a common narrative to deal with water challenges specific to peri-urban areas and the implementation of NBS. This would be attempted by developing best practices guidelines and policy recommendations for promoting NBS in the peri-urban for closing the water cycle gaps.

The project will include case study sites in Norway, Sweden, Spain, Poland, South Africa, India and Brazil where the project partners have established contacts and ongoing work as indicated later sections of the application.

1.4. Research methodology and approach

The research methodology for this project comprises 4 components. The first component relates to review of international experiences on NBS. This will involve first desk reviews of existing international literature on NBS for water with a view to identify factors affecting their implementation and effectiveness, focusing on the peri-urban context, followed by interviews with leading experts in the field. The review will be guided by a 'Framework Proposal' outlined below that emerges from the current knowledge of the consortium partners. It will consider social, economic & ecological sustainability dimensions related to NBS and the factors affecting these.

The second component will build upon the findings from the above exercise, developing the framework proposal below into a descriptive multidimensional assessment tool. The knowledge emerging from the review above will be combined with feedback gained from interviews and opinions of key stakeholders in the sector to translate the framework proposal into a coherent integrated methodological framework containing specific assessment criteria relevant to the peri-urban context. These criteria will help assess the feasibility &/or value of NBS for water & even draw the strengths & weaknesses of NBS versus conventional engineering solutions with regard to overcoming water challenges such as scarcity, water quality degradation, restoration or/and naturalization of water cycle in the peri-urban, in order to ultimately close the water cycle gap.

An outline of the framework proposal referred above is presented here:

Sustainability dimension	Nature of Indicator	Suggestive Criteria
Social	Political	Specific policy instruments; coherent regulations and long-term political support
	Administrative	Responsiveness for dealing with water & peri/urban sustainability stresses, availability of human resources (professional knowledge, skills), roles & division of responsibilities of water-related governmental organizations, vertically and horizontally
	Collaborative and Integrated approach	Cross-disciplinary and inclusive approach, involving civil society, research bodies, water-related and other actors actors related to the functionality of NBS.
	Societal	Citizen engagement, societal awareness
	Cultural	Cultural values & perceptions, local knowledge, gender perspective
Economic	Financial resources	Long-term financial support - public & private sector
	Cost-effectiveness	Comparison of long and short term cost effectiveness of NBS vis-à-vis conventional engineering solutions
Ecological	Ecosystem services	Impact on ecosystem services

	Water quality & quantity	Long-term impact on water quality & availability
	Climate	Implications for climate resilience

In the third component of the methodology, the assessment framework developed above will be applied to understand and assess existing NBS and conventional engineering solutions for addressing water cycle gaps in 8 different case study sites spread across the participating countries. The studies will be based on literature survey as well as field-based first-hand research, with data collection through interviews and focus groups with concerned stakeholders. A brief description of the case study sites is provided below:

Sweden: (1) **Rainwater harvesting (RWH) in Strauder in Gotland**. In recent years, the island of Gotland has been facing increasing water shortage. In southern part of the main island - Storsudret – which is most affected, the shortage is met through grey infrastructure-based solution of piped supply from the north. Among possible local solutions considered here is desalination which, however, is expensive & energy-intensive. In contrast stands the recently piloted NBS project based on RWH where a large part of the 20 MCM rainfall locally received will be harvested & stored in dams for facilitating groundwater recharge. This project also includes the possibility of participation of local stakeholders and inclusion of local knowledge. A comparative study of the 3 alternatives proposed/practiced for closing the water cycle gap in Storsudret will be made. This case study aims to generate knowledge on: 1) advantages & disadvantages of conventional grey- versus blue nature-based infrastructures in urban/peri-urban settings, 2) the role of local stakeholders & local knowledge in developing & managing local blue infrastructures, 3) necessary policy, institutional & governance changes required to implement NBS sustainably.
(2) **NBS in Årstafältet, a suburb in southern Stockholm**. *Årstafältet* is a large open field located in a valley, which is wet & muddy with soil conditions that make development of this area costly & risky. Nature-based facilities were constructed between 2005 & 2008 for transforming Årstafältet into a landscape park. These consist mainly of a stormwater pond, a small stream "Valla", a distribution ditch, surface screens, vegetated soil beds & water steps. The objectives have been to reduce the water load & the risk of overflows, clean the water, & restore the dry stream "Valla", in addition to biodiversity, cultural & pedagogic values. Because of growing housing demand, however, the original plan was altered with a plan to build urban settlements in 2006. The new plans integrate highly ambitious NBS in terms of scale & environmental, ecological, social & urban quality requirements & values. The plans comprise enlargement of the water pond & redesign of the stream into 3 water ponds merged into one watercourse. Trees planting along streets, rain-gardens & locally water-treated facilities alongside housing blocks are also planned as NBS to improve water quality & manage overflow & floods. This case study will reveal tensions & complements of NBS alongside conventional systems for water management in a newly urbanized area.
Spain: NBS for Barcelona Metropolitan backbone. The Spanish case study is located in Barcelona Metropolitan Area, where the overlapping of blue & green infrastructure as an ecological skeleton is a current challenge for the configuration of its peripheral limits. Its final goal is to improve its environmental quality & water cycle management under Mediterranean climate conditions of scarcity & torrential storms, reducing flood risks & taking advantage of underused freshwater resources to promote innovation for urban resilience. Specifically, the aim of this case study will be to: i) identify the ecosystem services provided by the past NBS interventions (flood management, river restoration, biodiversity increase, recreational areas); ii) understand how the previous NBS experiences built capacity for present & future urban green/blue infrastructure interventions; iii) analyze how advancing on environmental quality becomes a key driver for promoting NBS river & sea connectivity, through technical innovation developments to move towards a more sustainable water management (rainwater harvesting, groundwater use and water quality improvement).
Brazil: Reforestation. Restoration in Brazil has been spurred by international and national commitments. In the Atlantic Rainforest, a highly fragmented biome and a global biodiversity hotspot, restoration in private areas is being promoted by NGOs, government, and research organizations. The case study from Brazil will gather lessons learned from the 'Guandu Water Producer Project', the most advanced Payment for Environmental Service initiative in Latin America. Through this project, fees collected from water users will pay farmers to conserve and restore riparian forests on their lands. The Guandu Watershed is a vital source of drinking water for 8 million people in the city of Rio de Janeiro, and this project aims to encourage conservation and forest restoration practices to improve water

quality and quantity, as an alternative to conventional solutions. This case study will provide an example of environmental and socio-economic opportunities and challenges associated with restoration in Brazil.

Poland: Reforestation and melioration. Poland is a water-scarce country, referred to as 'the Sahara of Europe'. Although water-scarcity is well-known by the population, spurred by high water prices, in-house water use corresponds only to approximately 20% of the country's water use. Recently Poland was obliged to follow EU measures for sustainable water management forcing the implementation of water-saving measures at scale. The case study is located in Dąbrowa Tarnowska (south of Poland) and will present innovative approach to reforestation focused on maximising water retention through specialized soil preparation. The aim of the case study is to present economic and socio-environmental costs and benefits of this approach and compare it with conventional solutions applied in the region, such as melioration of streams. Ultimately, the results will be juxtaposed with the assessment framework as developed by the project.

Norway: Watershed management. Skien municipality represents a periurban area close to Oslo where a large-scale transformation project is planned - opening a buried river using blue-green infrastructure as a catalyst for city development, to mitigate potential flooding as a result of climate change and to improve water quality. However, the landscape transformation faces challenges; the Kjørbekk river is currently diverted in an aging concrete pipeline buried up to 15 meters deep thus rendering excavations technically challenging and expensive. Furthermore, some areas along the Kjørbekk have been buried using municipal waste which has now become a source of pollution downstream. The aim of this case study site is therefore to explore the available alternatives that prevent the transport of pollutants from the buried landfills in order to permit the excavation of the buried river and subsequent implementation of NBS. Potential solutions include stabilization, establishing a barrier, capping as well as local redistribution and reuse. These solutions will be assessed according to the local policy context including relevant regulations and local perceptions, the ecological benefits of increased biodiversity and pollutant load reduction, as well as the economic implications of each solution.

India: Rainwater harvesting. Urban centers in India are fast expanding into rural hinterlands, replacing wetlands and green spaces with built-up areas, in turn leading to increasing water scarcity & compromised water quality in new peri-urban areas. This contradicts with the historical scenario when NBS rooted in RWH used to constitute the most reliable local solution for urban water supply. Unfortunately, the value of NBS in general & RWH in urban development has been lost. Even under current policies/programs, such as AMRUT, water supply & development of green areas are being separately considered without any concern for water sustainability. This case study aims to undertake: 1) policy evaluation of current approaches to urban development in India from the perspective of NBS in the peri-urban; 2) participatory research on RWH in & around the arid town of Jaisalmer & the semi-arid mega-city of Bengaluru, engaging with stakeholders from governmental through civil society to community levels. Both these cities had a rich history of RWH (centralized state-based as well as decentralized community-based) but today face serious water quality and quantity challenges. The study will primarily help generate evidence-based knowledge on the potential of RWH as a source of peri-urban water sustainability (vis-à-vis conventional grey infrastructure-based approaches), and recommendations regarding the role of different stakeholders in taking forward such integrated approaches. It will offer lessons to be adopted in the European setting.

South Africa: Invasive Tree Management and Riparian Restoration. As a semi-arid developing country (MAR 450mm), South Africa faces significant water scarcity challenges with increasingly variable rainfall, frequent drought & floods, & growing water demand. In the Western Cape of South Africa, Berg-Breede river catchments supply strategic water sources to surrounding towns & agriculture, but supplies are dwindling & water quality is deteriorating. Several projects focusing on NBS/ecological infrastructure [as opposed to built infrastructure, which has reached limitations] are underway, & include a focus on alien tree clearing, riparian restoration & wetland reconstruction. In this case study, 2-3 sites facing significant peri-urban growth within these catchments will be assessed to determine strategies in place to address water availability & quality risks, through protection & restoration of ecological infrastructure, management of invasive alien trees, & how these might integrate with /or even replace hard engineering solutions. The objectives are to: (1) perform a scenario analysis on these 2-3 sites within the catchments to identify the main challenges for implementation of NBS in the peri-urban, & (2) study & describe the overall socio-economic-policy & governance context that would favor implementation of NBS.

The final component of the methodology will concern creation of a common narrative. Narratives are an effective method to systematically gather, analyze, and represent people's stories as told by them. It draws on reasoned analysis as well as empirical observation and as such is an ideal method for reflecting, together with relevant

stakeholders, on principles and indicators for designing and implementing NBS in periurban areas within the pan-European scale. WP4 will involve analysis of the knowledge generated in WPs 1, 2 & 3, & result in the production of a Handbook for practitioners that can promote & inspire implementation of NBS in the periurban.

1.5. Originality and innovative aspects of the research (ambition)

NATWIP aims at comprehensive research on NBS regarding water and wastewater-related needs in peri-urban areas. Though increasing interest in NBS in research and action is being expressed globally, this project's originality lies in: *first*, developing an innovative multi-disciplinary approach to designing & implementing NBS for water in the peri-urban, especially taking socio-economic perspective; *second*, evaluating the strengths & weaknesses of NBSs for water vis-a-vis conventional engineering solutions from economic, ecological & social perspectives; and *third*, adopting an evidence-based integrated approach rooted in European and international contexts to develop tools to promote NBSs for water in the peri-urban.

The innovation of the project basically lies in development of an interdisciplinary methodological framework to assess NBS for water and applying it to understand case situations spread across multiple European & international sites. The innovation further lies in creating a common narrative & hence best practices to deal with water challenges in the peri-urban through implementation of NBS. The innovativeness & comprehensiveness of the project can be further seen as represented by the 3 dimensions within which it operates: i) academic; ii) spatial; & iii) socio-political. **Academically**, NATWIP would promote knowledge exchange through interdisciplinarity approach to foster interaction between disciplines to develop a common language & a change in understanding[17]. **Spatially**, the case studies will illustrate NBS for water in seven countries spread throughout four different continents having distinct environmental, economic and social characteristics. This will help generate broad-based information regarding NBS' best practices and challenges for water and wastewater needs, serving as examples of solutions in different contexts. **Socio-politically,** the scientific data generated will be both dependent on inputs from local stakeholders and a useful tool in the creation of policy and action instruments, establishing a connection among science, society and decision-makers. The inclusion of stakeholders in the process would improve acceptance regarding the project, as well as amplify their awareness on water challenges and on the importance and scope of their participation in NBS activities for sustainable water resources management.

The project will also operate at research-development interface, exploring and highlighting benefits of collaboration, such as with private sector (Polish partner) & between researchers and practitioners, who deal with opportunities and challenges of NBS implementation in practice.

1.6. Clarity and quality of transfer of knowledge for the development of the consortium partners in light of the proposal objectives

The knowledge transfer within the consortium can be seen along the following axes: 1) cross-disciplinary, 2) spatial, 3) methodological. The different project partners connect to water and the NBS through different disciplinary specialisations & different spatial contexts. Since the project activities will be carried out jointly, especially under WPs 1, 2 & 4, they will enrich cross-disciplinary perspectives knowledge through collaborative learning. Sharing the case studies from diverse spatial settings at project meetings and through internal project communication will also enable knowledge sharing. Finally, since the methodological framework to be developed under WP 2 is cross-disciplinary, the process itself will facilitate knowledge-sharing and mutual learning among the project partners. In order to facilitate transfer of knowledge for the development of the consortium partners, some of proposed tools to be used include: 1) a project website where outcomes of the different WPs will be published, which will be usable by the partners as well as external stakeholders; 2) presentations of project outcomes at the regular project meetings and in conferences; 3) joint co-authored scientific writings presenting inter-disciplinary perspectives. Since the proposed project builds closely on the previous research experiences of the different project partners, implementation of the project activities, especially through collaborative working will lead to sharing of existing knowledge as well. Further, through knowledge about the comparison of different technologies - blue/green under NBS vs. conventional grey infrastructures, all members of the consortium will help create will contribute to strengthened shared knowledge on the most sustainable solutions for water management.

[17] Zaucha, J., Davoudi, S., Slob, A.F.L., van Meerker, I., Bouma, G., Breedveld, G.D., Oen, A.M.P. (2016). State of the lagoon reports as vehicles of cross-disciplinary integration. *Integrated Environmental Assessment and Management*, DOI: 10.1002/ieam.1802.

1.7. Quality of the consortium partners and collaborative arrangements. Capacity of the consortium to reinforce a position of leadership in the proposed research field

From a collaborative & transdisciplinary approach, partners enable the development of a network for knowledge generation, & bridging knowledge that relates to social & ecological systems in relation to NBS. In addition to recognized excellence in the production of the scientific knowledge, the members of the consortium have a long history of research and development, contributing to practical solutions & policy mechanisms. The partners represent different knowledge backgrounds & specializations, & the consortium includes not only academic institutions but also research foundations & private sector, further facilitating development of collaborative action in the field. The partners have a number of important research publications & scientific presentations in the area related to this application. A sample of these publications and other scientific activities are presented in CVs of the PIs & under Section 4. A brief outline of strengths and capacities of participating institutions is presented below.

Partner 1, KTH, Sweden is a one of Europe's leading technical and engineering universities working with industry and society in the pursuit of sustainable solutions to some of humanity's greatest challenges such as climate change, urbanization and water sustainability. Two departments from KTH will participate in the project: Sustainable Development, Environmental Science & Engineering (SEED) & Urban Planning & Environment (UPE), both of which engage in research & education focused on sustainable development, with a broad range of interdisciplinary expertise including engineering, socio-economic, modelling, & planning for use of natural resources & built environment. **Partner 2, Stellenbosch University, South Africa,** has the Dept. of Conservation Ecology & Entomology which undertakes teaching, research & technology transfer in ecology, conservation & management of utilized landscapes. Ecological Restoration is an active research focus, with links to research institutes (e.g. Stellenbosch Water Institute) & collaborative water-related fora (Freshwater Forum). **Partner 3, Centre for Conservation & Sustainability Science (CSRio), Pontifical Catholic University, Brazil,** has led over the last years a number of projects related to periurban and large-scale restoration, such as in the city of Rio de Janeiro. **Partner 4, UPC, Spain,** where the University Research Institute for Sustainability Science & Technology engages in research on sustainability with a mission to generate technical and conceptual tools to create a more sustainable production model, and to collaborate in the UPC's endeavour to provide scientific and technical support for social, cultural and economic progress. **Partner 5, Norwegian Geotechnical Institute (NGI), Norway** has been a leading international centre for research & consulting within geosciences for over 60 years. Here research scientists get the opportunity to exchange with practicing engineers working on challenging projects such as risk assessments & management of contaminated sites as well as risk reduction through climate adaptation, besides implementation of NBS in mountain regions to mitigate natural hazards. **Partner 6, University of Agriculture in Krakow (UAK), Poland** where the Institute of Agricultural Engineering & Informatics has been involved in projects looking into smart solutions to water use both in the laboratory scale as well as in the field. The Institute operates with an interdisciplinary team of engineers, environmental scientists, forestry and agronomy specialists involved in projects related to sustainable land management and smart solutions for water management. **Partner 7, "Wrzos" company, Poland** which has been working with forest management, including water melioration since 1995. The company has a stable position on the forest services market. Over the last years, it has been actively cooperating with the UAK, organizing practical exercises for students & equipment demonstrations, and collaborating on other R&D activities. The company's branch operates in Germany. P**artner 8, ANC, India,** which leads the state of Bihar, India in transdisciplinary, multinational research & exchange programmes. It has a multidisciplinary team that engages in research on different dimensions of water and environmental management in connection with urban as well as peri-urban and rural settings.

The quality of the consortium partners and collaborative arrangements outlined above & in other relevant sections elaborates the capacity of the consortium to reinforce a position of leadership in the proposed research field.

2. IMPACT

2.1. Impact of the proposal

Contribution of the proposal to the goals of the 2017 Joint Call:

NATWIP will contribute for closing the water cycle gap in the peri-urban areas, tackling themes 2 and 3 of 2018 Joint Call ("Strengthening socio-economic approaches to water management" and "Supporting tools for sustainable integrative management of water resources", respectively). NATWIP will strengthen socio-economic approaches to water management by developing and sharing knowledge on NBS in peri-urban areas; proposing management tools and best practices guidelines regarding this theme; & raising social awareness about NBS; and defining ways and

means for enhancing their acceptance and incorporation within policy and action instruments, & social acceptance of the new practices. It will also develop supporting tools for sustainable integrative management of water resources by establishing networks and knowledge sharing among partner institutions and by creating a framework for assessing and verifying different aspects of NBS, based on several performance assessment tools. Lastly, case studies in various countries will provide information that could possibly be adapted to regions beyond the study areas.
NATWIP contributes to expected impacts as stipulated in the Water JPI 2018 Joint Call by:

(i) Supporting cross-cutting issues to include integrated transdisciplinary research that creates a bridge between science & policy, as well as environmental, social & economic aspects related to NBS implementation for water; (ii) Conducting activities at case study sites where the project partners have existing relationships to build on on-going research activities; (iii) Involving local stakeholders to provide local context, tacit knowledge & to raise awareness; (iv) Including case study sites in South Africa, India & Brazil to encourage international cooperation & knowledge exchange; (v) Promoting knowledge exchange and dissemination to stakeholders for future implementation of NBS.

T**ransnational added-value of the collaboration between consortium partners:** The research is conducted by investigators from eight organizations, located in seven different countries spread throughout four continents. This transnationality implies in multiple ecological, cultural, political & economic backgrounds, providing a rich collection of experiences and lessons-learned from research and practice.

Mid- and long-term benefits of this collaborative effort:
Among the **mid-term benefits** foreseen are: first, shared learning on issues of mutual concern related to NBS and conventional engineering solutions for closing the water cycle gaps. Co-creation of the innovative interdisciplinary sustainability assessment framework will enhance trans-disciplinary understanding on the subject for the partners, while for the wider group of stakeholders it will bring forth a new tool to promote sustainable water management in the peri-urban. Another mid-term benefit for the consortium would be joint writing of scientific papers and book on the subject based on the project learning. Among **long-term benefits** are included a clearer understanding and robust tools for incorporating sustainable water management in the peri-urban through integration of NBS. This in turn would imply capacity building of the partners and other actors, increased resilience to climate and other drivers impacting the water cycle, and application of case-based knowledge to solve problems.

Plans for the continued networking and knowledge sharing after the conclusion of the project:
The different project partners, namely, Poland, Brazil and Norway, and Brazil-South Africa. have already collaborated before. Similarly, Norway, Sweden & India have had collaborations in the past. NATWIP will help strengthen the existing collaborations & through co-creation of new knowledge help continuation of the partnership. Given the limitation of time during the project period, after conclusion of the project, the publications/reports/case studies etc. produced within the framework of the project will be further developed jointly for co-authored scientific publications, such as research articles & books. Further, more joint presentations at conferences will be made & newer collaborative project funding will be sought to extend the research on NBS for water. Moreover, the private partner (number 7) would practically apply the outcomes of the project in field even after conclusion of the project.

European and/or International dimension of the research methodologies and approaches: The case study methodology adopted in this project will have European & international dimensions directly, since cases from Brazil, India and South Africa are also included, besides European. Moreover, even the assessment framework to be developed will derive its basis from the existing context in these different geographical locations.

Added-value of the partnership to Water RDI: The partnership brings together institutions engaged in research &/or education on sustainable development and water sustainability from a variety of disciplinary perspectives. The study places an emphasis on integrated transdisciplinary research that would create a bridge between these different perspectives and also between science and policy. Gaps between environmental, social and economic aspects related to NBS implementation for water management will also be addressed. From the social sciences, the NATWIP project draws inspiration from scholarship within fields of public policy, political science, environmental anthropology, geography, environmental history and spatial planning. From the technical sciences strength is drawn from a range of water quality and quantity knowledge & tools as well as knowledge on managing risk & uncertainty. Mobilization of end-user participation is a key aspect for knowledge exchange. Besides, partners in the consortium participate in wider water, environmental & development networks where it will be possible to share the knowledge generated by the project & motivate more actors. Examples include ‘Freshwater Forum’ & ‘ICLEI - Local Governments for Sustainability’ network. Co-creation of interdisciplinary new knowledge on NBS by this specialized multidisciplinary partnership & its sharing within & beyond it will add much positive value to Water RDI.

Potential impact of the proposed innovative solutions and/or services on business/industries, improvement of social wellbeing and environment:

With participation of the private sector that operates internationally, this project has a great potential to bridge science and practice. Through expanding knowledge & experience about new technologies, the company has a direct impact on activities in the field and by sharing its experience on innovative soil management for water retention in restoration it will transfer know-how to other partners of the consortium, and beyond. This may directly contribute to modernization of existing technologies and development of new technologies. The project outputs are further foreseen to strengthen capacities of state agencies, NGOs & other actors dealing with urban/peri-urban planning, use & management of natural resources, in understanding the relative strengths & weaknesses of NBS vis-a-vis conventional engineering solutions, thus making a progress towards integrating NBS in their actions. Even ordinary citizens as water users will be sensitized towards its relative benefits. Further, NBS are directly connected to ecosystem-based approaches, & hence promote protection of environment, while as more sustainable solutions for closing the water cycle gaps, NBS implies improvement of social well-being since water is the key resource for life.

2.2. Expected outputs

The major expected outputs of the project are as follows:

1. Project website which will regularly publish information and updates about NATWIP, including its activities, events and documents resulting from the research.
2. Review report on international experiences on NBS for water - A comprehensive scientific report published on project website, also submitted as a research article
3. Sustainability Assessment of Nature-Based Solutions for Water in the Peri-Urban - A 'Methodology Guidebook': This will be the main methodological output of the project which will be in the form of a framework for assessment of NBS to be developed under WP2 & published on project website.
4. Case studies on NBS for Water in the Peri-Urban - 8 independent briefs published on project website, each could be also developed & published later as scientific articles.
5. NBS for water in the Peri- Urban: A policy brief - Brief outline of the major findings of the project in the form of policy recommendations aimed primarily at policy-makers & planners concerned with peri-urban areas.
6. NBS for water- Popular science publications in the form of 'photo-stories' & booklets, to be made available on project website, primarily targeting ordinary water users, students, local NGOs and civil society forums & citizens at large.
7. NBS for Water in the Peri-Urban: A Handbook for practitioners - to contain the Best Practices, in the form of a Handbook on Project website, eventually as a book.

In addition, the following outputs are also foreseen:

- Master's thesis works where students are engaged in carrying out the case studies or other activities as part of the joint learning, as is expected for Partner 8 (A.N. College, India)
- A study visits by project partners to the case study sites in Sweden during WP 3 to promote knowledge-sharing.
- Participation & presentations in conferences - SER 2019 in Cape Town, South Africa & at the World Water Week 2020 & 2021 in Stockholm. This will help joint learning as well as sharing of knowledge with outside stakeholders including the research and action communities located outside the partner organisations & countries.

2.3. Exploitation and communication activities (measures to maximise impact)

NATWIP will establish a knowledge exchange platform in the form of a website disclosing and providing information generated over the course of the project period. Expected deliverables include a website, guidance papers, conference presentations such as at the SER (Society for Ecological Restoration) Conference & World Water Week (WWW); WP reports as well as peer reviewed articles and a book. One of the first communication tasks will be to finalize the project's dissemination strategy during the kick-off project meeting in Month 1. This task will review and identify (1) specific policy topics or areas where the NATWIP-project can add value, (2) preferred information dissemination routes and formats. Channels of e-communication, including the project website & other existing platforms (e.g., in Cape - Freshwater Forum; Fynbos Forum, ICLEI) will be utilized by the project to raise awareness about the project and its results during the project period and will remain available after the project is completed. Materials will be designed to be accessible and written using non-technical terminology and will consider cultural and gender issues to ensure results are available to as wide an audience as possible and do not discriminate in any way. Besides, keeping in view the importance of end-user participation, visual communication medium will be used for improved motivation where 'photo-stories' based on the case studies and related themes will be

developed, which will be made available on the project website. Moreover, one dissemination workshop will be organised in every European partner country in Month 35 (WP4) by the concerned PI where as many relevant stakeholders connected with water management in the peri-urban, from public, private, civil society, etc. will be invited. The findings of the research will be shared at this workshop so as to facilitate implementation of the outcomes.

2.4. Market knowledge and economic advantages/return of investment

The potential market for the new knowledge in Europe as well as internationally lies with the authorities as well as the private sector that are engaged in NBS-based solutions for sustainable urban development. The new knowledge to be developed for NBS would promote a circular economy as well as a blue-green economy where more efficient water management through naturally-oriented water cycle will be combined with green infrastructure to promote socio-economic development in the peri-urban spaces.

The economic advantages would be long-term as well as short-term. In the long term, the sustainability of environment and water resources would imply cutting down on the costs of, for example, treating polluted water, or impacts of water pollution on other sectors, such as tourism. In other words, the promotion of NBS in the peri-urban would contribute to all-round socio-economic development where several different sectors would be able to make gains. In the short-term perspective, the business of related companies that engage in urban development and in the environmental sector, would be boosted if they would adopt NBS along the lines proposed in the project outcomes. For example, the private partner in Poland, Wrzos enterprise, will be able to engage more deeply and effectively in NBS as a part of their business. It may further directly contribute to modernization of existing technologies and development of new technologies in the sector.

3. IMPLEMENTATION

3.1. Overall coherence and effectiveness of the work plan

Overview of project implementation:

The work plan consists of 5 WPs, of which the first 4 correspond to the different research objectives listed earlier. The fifth WP deals with project management & communication. Every WP will be jointly carried out by all the partners, bringing in their disciplinary strengths, and thus every partner is involved in every WP which will facilitate mutual learning hands-on. However, each WP will have at least one specific leader to coordinate its activities, ensuring that the time plan is followed, and milestones and deliverables are achieved. Details about the major tasks to be undertaken in the WPs and the WP leaders are summarized in the table 3.1.

A number of deliverables and milestones have been identified during the course of the project which are outlined in table 3.2. The project monitoring events will mainly comprise 3 project meetings initiated with a kick-off meeting in Month 1, followed by a mid-term meeting in Month 15, and finally a closing meeting in Month 28. Besides, project monitoring will be a continuous process through regular e-communication among the project's Steering Group members, WP leaders and PIs. In order to facilitate mutual learning and sharing of knowledge, there will be a study visit organised in Sweden to the two case study sites.

Table 3.1: Description of Work Packages

WP Number	WP Title	Duration (months)	Starting Month	End Month	WP Description
WP1	Review of international experiences	8	2	9	Conduct a literature review of international experiences to identify barriers, lessons learned & challenges in the implementation of different NBS. Also conduct interviews with leading experts working with NBS. Further, also conduct a literature review to establish current practices within water management specifically in periurban areas. This activity contributes to the research in WPs 2,3 & 4. **WP leader:** Partner 4 (UPC, Spain)
WP2	Establish methodologica	6	10	15	Develop a comprehensive framework for assessing the different aspects of the performance of NBS, especially

	l framework to assess NBS				with regard to ecological, economic & social dimensions; **WP leader:** Partner 6 (UAK, Poland)
WP3	Apply the NBS assessment framework to case study sites	13	16	28	The results of the assessment framework will be applied in relation to the specific socio-political context for 8 selected case study sites as described in section 1.4. This will include i) a scenario study ii) a comparative analysis & iii) reflection on conditions that favour the implementation of NBS and their driving forces. The studies will be based on literature survey as well as field visits, with data collection through interviews and focus groups with concerned stakeholders: **WP leader:** Partner 5 (NGI, Norway)
WP4	Create a common narrative	8	29	36	This WP aims at creating a narrative based on reasoned analysis, empirical observations & reflections gathered together with relevant stakeholders, on principles, processes & indicators for designing & implementing NBS in peri-urban areas within the pan-European scale. It will bring together outcomes from WPs 1, 2 & 3, combined with reflections from stakeholder workshops/meetings undertaken during this WP in respective partner countries: **WP leader:** Partner 2 (ConsEnt-SU, South Africa), together with partner 1 (KTH, Sweden)
WP5	Project management & communicatio n	36	1	36	This WP includes project initiation, coordination, monitoring, communication, knowledge management and dissemination, and reporting activities. On the whole, it aims to complete the proposed project in accordance with the time plan, budget and listed outputs/deliverables, & also effectively communicating among project partners & with stakeholders. Though responsibility for the content of each WP would lie with respective WP leaders & other partners, the WP leader (also the Consortium Leader) would be responsible for effective implementation of the whole project; **WP leader:** Partner 1 (KTH, Sweden)

Table 3.2: Major deliverables & Milestones

WP Number	Deliverable Number/Date	Deliverable Title and Description	Milestone No./Date	Milestone Description
WP1	D1.1/Month 3	NATWIP project website		
WP1	D1.2 /Month 9	Review report on international experiences on NBS for water- A comprehensive scientific report published on project website, also submitted as a research article	M1/ Month 9	Publication of the review report at the end of WP1 (D1.2)

WP2	D2.1/Month 15	Sustainability Assessment of NBS for Water in the Peri-Urban -A 'Methodology Guidebook': outlining the assessment framework, to be published on project website	**M2**/ Month 15	Formulation of methodological framework for sustainability assessment of NBS for water at end of WP2, to coincide with project monitoring 2 / mid-term project meeting
WP3	D 3.1-3.8/ Month 28	Case studies on NBS for Water in the Peri-Urban - 8 independent briefs published on project website	M3/Month 28	Completion of the case studies, to coincide with project monitoring meeting (PM) 3, & study visits to sites in Sweden
WP4	D4.1/Month 35	Dissemination workshop in every European partner country where stakeholders connected with water management in the peri-urban, from public, private, civil society, etc. will participate, for sharing of the research findings so as to facilitate implementation of the outcomes.		
	D4.2/Month 36	NBS for water in the Peri-Urban: A policy brief - Brief outline of the major findings of the project in the form of policy recommendations		
	D4.3/Month 36	NBS for water- Popular science publications in the form of 'photo-stories' & booklets, to be made available on project website		
	D4.4/Month 36	NBS for Water in the Peri-Urban: A Handbook for practitioners - to contain the methodological framework and 8 Case Studies, in the form of a Report on Project website, eventually as a book		

3.2. Appropriateness of the management structure and procedures, including quality management

The project team comprises 8 partner institutions who will be contributing to the research & innovation content of the project. However, out of these, only 6 - those included in Part A of the application - will comprise the core team responsible for planning & decision-making. The project management activities will form part of WP5, led by the Project Coordinator (PC). The PIs of the 6 core partners, namely KTH, ConsEnt-SU, CSRio-PUC, UPC, NGI, &UAK, will constitute the project's Steering Group, with the PC at the lead. The Steering Group will be responsible for taking strategic decisions about the project implementation and activities. Examples include detailed work plan

GANTT CHART (Example with work packages, events, dissemination, public engagement activities, deliverables, milestones or others. Delete rows and columns that do not apply).

Month/ Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Work Package 1		←	–	W	P	1		–	→																											
Work Package 2										←	–	W	P	2	→																					
Work Package 3																	←	–	–		W	P	3		→	–	–	→								
Work Package 4																													←	–	W	P	4	–	–	→
Work Package 5	←	–	–	–	–	–	–	–	–	–	–	–	–	W	P	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	→
Deliverable				D 1. 1					D 1. 2						D 2. 1													D 3. 1- 3, 8							D 4. 1- 4. 3
Milestone									M 1						M 2													M 3							
Progress Monitoring	P M 1														P M 2													P M 3							
Study visit (SV) & project workshop (PW)																												S V 1						P W 1	
Risk Management	←	–	–	–	–	–	–	–	–		O	N	G	O	I	N	G		P	R	O	C	E	S	S				→							
Conference participation						S E R											W W W												W W W							

and dissemination strategy to be decided during the project kick-off meeting. Any changes required in the project work plan will require approval from the Steering Group during the course of the project.

The task of the PC will be to lead the project activities, supervise the implementation of the WPs according to the time plan, and act as the contact person between the project team and the Water-JPI secretariat for all administrative purposes. She will be responsible for organizing the project meetings and coordinating all other activities that need a central anchoring point. The PC will also act as the Secretary of the Steering Group, helping with project administration activities. Each WP will have a WP leader whose main task will be to lead the activities and coordinate the different partners to work on pre-decided themes & within timelines, including preparation of the deliverables.

At the level of WP, progress monitoring will thus be the responsibility of the WP leader. Though quality of the output produced under each WP will be first the responsibility of each participating PI, the overall responsibility will also be shared by the WP leader concerned. At the project level, monitoring of progress will be done by the Steering Group, especially during the project meetings 2 & 3, scheduled for Months 17 & 29 respectively. These project meetings are scheduled to coincide with the near-completion of WPs 2 & 3 which are independent and the most critical activities in the project. During these meetings, progress made by each PI will be presented and contents of the scientific developments will be shared to facilitate knowledge transfer. In addition, to improve project management, interim 'skype' meetings will also be organized to monitor progress or resolve issues as required. In addition to the above mechanisms, for ensuring smooth cooperation throughout the project period, regular communication will be maintained among the project partners through emails, skype and other digital media.

Financial management in the project will be decentralized and administered & monitored by the respective PIs since the funds will be received by them directly from their national funding agencies. However, in case of any project-level questions, assistance will be provided by the PC. Procedures and tools for communication within the project and beyond have already been described in section 2.3.

3.3. Risk management

The potential project risks could come from different sources (internal/external and technical/non-technical) so several mitigation measures are considered to prevent them. First, the coordination of a diverse and world-wide consortium requires specific management mechanism such as three annual meetings as already planned in order to ensure an effective collaboration and feedback among partners. Additionally, extra meetings can be held if it is considered necessary due to unexpected circumstances. In the case of conflict and disagreement among partners, it will be under project coordinator's responsibility, establishing communication flows and methods and calling for bilateral meetings if necessary. Such meetings can also be organised on 'skype', if necessary.

The case studies can experience delays in the planning of interviews with stakeholders and experts due to local circumstances such as non-availability of time, political situation or lack of funding. The PI nominated for each case study will take responsibility for achieving milestones and deliverables concerning their respective cases.

3.4. Potential and commitment of the consortium to realise the project

The consortium is composed of 8 partners from different countries with different backgrounds which guarantee the transdisciplinarity required for exploring a multi-dimensional study on NBS that combines theory with practice as proposed in this project. The involved partners' potential & expertise is elaborated by the CVs of the PIs and related descriptions under sections 4 & 5. These explicitly point out how their expertise match the project's objectives. In fact, the development of the project has been a combined integrated effort on part of all the partners, right from the conception of the project idea to developing its implementation plan and impact. Beyond each partner expertise, the presence of technical, ecological and social sciences offers a potential complementary that should be explored and enhanced. Partners' involvement in the on-going local projects with strong relationships with stakeholders, community leaders and experts is yet another relevant condition that also shows the researcher's commitment with their local urban policies. Moreover, the close location of most of the institutions to studied territories facilitates the fieldwork and the permanent collaboration and implication with the study cases.

The commitment of the institutions to this project is also reflected by their interest shown by the researchers in the project, which in turn, can be gauged by the fact that every partner has additional researchers apart from the PI, (with the exception of the private partner number 7).

4. DESCRIPTION OF THE PARTICIPATING RESEARCHERS

Partner Number, according to Part A	Research Team Members (for personnel include name, position & affiliation)	General Description
Partner 1(KTH, Sweden, PI: Nandita Singh)	Dr. Lina Suleiman, Researcher, Department of Urban Planning and Environment / ABE School - Royal Institute of Technology (KTH) Sweden.	Lina has PhD degree titled "TeknDr. in Infrastructure with specialization in Planning & Implementation", KTH. She was a Post-Doc Scholar & a visiting researcher at Univ. of Newcastle & Universitat Autònoma de Barcelona, & has received many grants & awards, e.g.: financial award for distinguished academic progress from the ESSI International Master's program, & 2 grants for PhD project from Sida. As a main applicant, she received a postdoctoral scholarship & grants for 4 research projects, from Formas & Vetenskapsrådet. She is leader for project "UrbanRain" (http://www.urbanrain.se/), & for another one on civil society from 2014.
Partner 2 (SU, South Africa, PI: Karen J. Esler)	Dr Alanna Rebelo, Post Doc, Conservation Ecology and Entomology Department, Stellenbosch University	Dr. Robelo's primary field is wetland ecology, ecological applications of remote sensing, impacts of invasive alien plants (particularly trees) on water cycle & biodiversity, & benefits to society of intact or restored wetland ecosystems (ecosystem services). She is part of a large transdisciplinary team investigating the socio-economic benefits of investing in ecological infrastructure related to water security in South Africa. In 2014, she was awarded an Erasmus Mundus Scholarship through the European Commission to do a joint doctorate at Antwerp University and Stellenbosch University, which she completed in 2017.
Partner 3 (CSRio, Brazil, PI: Bernardo Strassburg)	Viviane Dib (VD)	VD is PhD student and MSc in Ecology, Researcher at CSRio and Research Assistant at International Institute for Sustainability (IIS). Her main specialization is in evaluating the influence of land use and land cover on water related ecosystem services. IL is MSc in Sustainable Development Practices, Researcher at CSRio, and Project and Research Assistant at IIS. IP is MSc in Territorial Development and Public Policy, Researcher at CSRio, and Project and Research Assistant at IIS. VM is PhD in Ecology, Researcher at CSRio and Postdoctoral Researcher at IIS. AR is PhD student & MSc in Geography, Researcher at CSRio & Research Assistant at IIS. FT is MSc in Ecology, Researcher at CSRio and Research Assistant at IIS.
	Isabella Leite (IL)	
	Ingrid Pena (IP)	
	Verônica Maioli (VM)	
	Aline Rodrigues (AR)	
	Fernanda Tubenchlak (FT)	
Partner 4 (UPC, Spain, PI: Elisabet Roca)	Prof. Míriam Villares, Dept of Civil & Envl.Eng. & the Institute of Envl. Science & Technology, UPC	Associate Professor and senior researcher in human geography, urban planning and social and environmental impacts of civil engineering. She is the head of the social science section at the Department of Civil and Environmental Engineering of the School of Civil Engineering of UPC.
	Nancy Andrea Ramírez-Agudelo, PhD Student at Inst. of Envl.. Science & Technology, UPC	PhD Student on sustainability, participating in analysis of collaborative management for the Littoral Besòs Project Sustainable Territory - Territorial Competitiveness Specialisation Project, of European Regional Development Fund (ERDF).

Partner Number, according to Part A	Research Team Members (for personnel include name, position and affiliation)	General Description
Partner 5 (NGI, Norway, PI: Sarah Hale)	Amy Oen, Senior researcher, NGI	Dr Amy Oen is a senior research scientist working in environmental technology field for last 20 years. Her expertise relates to risk assessment, monitoring, cost-benefit analysis of pollution control measures, integrated river basin management to include knowledge brokering to improve stakeholder involvement. She has led /coordinated several multi-disciplinary national and international research projects - H2020 project PHUSICOS (2018-2022) with NBS for risk reduction); EU FP7 project ARCH (2011-2015) to manage multiple pressures on lagoons; European Research Area for Climates Services funded project EVOKED (2017-2020) focusing on climate services on the vulnerable water sectors.
	Gijs D. Breedveld, Technical Director, NGI	Gijs Breedveld is coordinating R&D activities in the field of environmental engineering. He has a background from soil and environmental chemistry and focuses on research, teaching and consulting on soil, sediment and groundwater pollution problems, with emphasis on risk reduction and development of remediation technologies. Lead author of the Norwegian Environment Agencies guidelines for risk assessment of contaminated soil and groundwater as well as the recently revised guidelines for risk assessment of contaminated sediments. He is also Ass. Prof. at Envl. Geochemistry, Dept of Geosciences, Univ. of Oslo.
Partner 6 (University of Agriculture, Krakow, UAK, Poland, PI: Agnieszka Latawiec)	Professor Maciej Kuboń, Institute of Agricultural Engineering & Informatics, UAK	His research deals with issues of environmental protection & its shaping as well as economic & logistic aspects of agricultural farming & forestry. He cooperates with many establishments providing forest services within the scope of innovative methods of protection, shaping & securing forests & is the author of several dozens of expert opinions made for the purpose.
	Assoc.Prof. Dr Hubert Latała, Head of Department of Technical Infrastructure and Eco-energy, at UAK	His over 35 years of scientific work deals with issues related to use of unconventional energy sources, searching for innovative ways for processing water & other issues. One of his current research deals with sustainable management of water resources in electricity production.Main contractor & task manager in HortiEnergia project (2010-2015) of EU.
Partner 7 (“Wrzos”, Poland)	N.A.	From this company, only the PI W. Grzebieniowski will participate.
Partner 8 (A.N. College, India, PI: Nupur Bose)	Dr. Ratna Amrit, Associate Professor, Department of History	Dr. Amrit specializes in Environmental History with focus on traditional water practices. Her study includes assessment of present-day floods & embankments of River Kosi, & their ramifications on the socio-economic milieu. She has worked extensively on tracing the present status of traditional water management in Bihar, taking a critical approach towards the revival of traditional surface water storage & rainwater harvesting systems.

5. CAPACITY OF THE CONSORTIUM ORGANISATIONS

Partner Number (Organisation Name)		General Description
Partner 1 (KTH)	**Role and main responsibilities in the project**	As WP 5 leader, lead, coordinate & manage NATWIP activities. Also, WP 4 co-leader, & carry out case studies in Sweden & India & contribute to all WPs, including role of local stakeholders, local knowledge & policy analysis.
	Key research facilities, infra- structure, equipment	KTH has remarkable strengths in research & education on different sustainability assessment & planning methods & tools to assist stakeholders in decision-making in environmental sector, with water as important focus.
	Relevant publications and/or research /innovation products	**Suleiman, L.,** et al. (Submitted 2018) A transition towards urban RWH from the backdoor of urban greening-Case studies from Stockholm & Barcelona, *Jr. of Envl. Policy & Planning*; **Singh, N.** & Singh, O.P. (2015) Climate change, water & gender: Impact & adaptation in North-Eastern Hills of India. *Intl. Soc. Work* 58.
Partner 2 (ConsEnt, SU, South Africa)	**Role and main responsibilities**	WP 4 leader; Carry out case study in South Africa, including engagement with local stakeholders, local knowledge and policy analysis
	Key research facilities, infra-structure, equipment	SU is well-situated close to study sites; PI has a well-functioning ecology laboratory, access to stakeholders and a collaborative learning network on the focus catchment. Access to vehicles for transport & computing power.
	Relevant publica-tions and/or research /innovation products	SU hosts the **Stellenbosch Water Institute**, a multidisciplinary research collective that recognises the complex nature of water management and supply in a water-scarce country such as South Africa.
Partner 3 (CSRio-PUC)	**Role and main responsibilities in the project**	WP 4 leader, share knowledge on prioritization of restoration for water management, lessons learned from Payments for Ecosystem Services schemes, analysis of ecosystem services
	Key research facilities, etc	Please see the comment above
	Relevant publications and/or research/innovation products	**Strassburg BBN** et al. Role of natural regeneration to ecosystem services provision & habitat availability: a case study in the Brazilian Atlantic Forest. *Biotropica* 2016, 48; **Rocha RCP, Strassburg BBN** et al. Ecological restoration success is higher for natural regeneration than for active restoration in tropical forests. *Science Advances*, 2017, 3(11).
Partner 4 (UPC)	**Role and main responsibilities in project**	WP 1 leader, participate in all WPs, special effort will be dedicated to the Spanish case study that is completely under UPC responsibility.
	Key research facilities, infra- structure, equipment	UPC has several departments related with urban planning & water management & has a Campus located in the geographical domain of the Spanish Case study. This implies a direct access to our living laboratory and the civil society.
	Relevant publications and/or research /innovation products	**Roca, E**. A. Villares, M. et al. 2018. Applying network analysis to assess coastal risk planning. *Ocean & Coastal management*, 162, 127-136; **Roca, E**. Villares, M. et al. 2015. Public perception & social network analysis for coastal risk management in Maresme Sud (Barcelona, Catalonia*). Jr. of Coastal Conservation*, 19.

Partner Number (Organisation Name)		General Description
Partner 5 (NGI)	**Role and main responsibilities in the project**	WP3 leader - coordinating activities to take place at the different case study sites to ensure synergy with WP1& 2; also case study site contact for Norway
	Key research facilities, infra-structure, equipment	NGI's laboratory & associated workshops & pilot facility for small-scale model experiments measure a total of 2,000 sq.m. The lab is one of the cornerstones of our operation and represents basis for many of NGI's areas of expertise.
	Relevant publications and/or research/innovation products	i) S.E. Hale, G.D. Breedveld, et al. (2017) "Sorbent amendment as a remediation strategy to reduce PFAS mobility and leaching in a contaminated sandy soil from a Norwegian firefighting training facility", *Chemosphere*, 171, 9-18; ii) Oen, A.M.P.; Breedveld, G.D. et al. (2016): Stakeholder involvement for management of the coastal zone. *Integ. Environ. Assess. Manag*., 12:701-10.
Partner 6 (UAK)	**Role and main responsibilities in the project**	WP 2 leader, provide case studies from Poland, present cost-benefit analysis for NBS and conventional solution for water management, participation in framework development and its application
	Key research facilities, infrastructure, equipment	The Institute of Agricultural Engineering & Informatics is involved in projects looking into smart solutions to water use both in the laboratory & field (e.g. Biostrateg project, 2017-2020). It operates with an interdisciplinary team of engineers, environmental scientists, forestry & agronomy specialists.
	Relevant publications and/or research/innovation products	i) Alves-Pinto HN, Latawiec AE, Strassburg BBN et al. Reconciling rural development & ecological restoration: Strategies & policy recommendations for Brazilian Atlantic Forest, *Land Use Policy*, 2017, 60; ii)Latawiec AE et al. Creating space for large-scale restoration in tropical agricultural landscapes, *Frontiers in Ecology & the Environment*, 2015, 13(4).
Partner 7 (Wrzos enterprise)	**Role and main responsibilities in the project**	Share data on costs and benefits on NBS and conventional solution for water management, facilitating research-development activities, bridging science with practice.
	Key research facilities, infrastructure, equipment	The company takes an active part in forest and fire protection & performs forest renewal on approximately 40 hectares and seedling plantings on 100 hectares. It has specialized equipment for all work in the forest, such as excavator with an auto-trailer for irrigation, long-cutter for soil preparation in wetlands renovation.
	Relevant publications and/or research/ innovation products	Innovative solution for soil management in reforestation projects to maximise water retention
Partner 8 (A.N. College)	**Role and main responsibilities in the project**	Support all WPs as an important knowledge partner as well as facilitator of the research, providing practical research and logistics support. Conduct case studies in one or more selected sites in India to reach the project goals.
	Key research facilities, infra-structure, equipment	Multidisciplinary team engaging in research on water management & NBS; 5 well equipped laboratories - Instrumentation, Hydrology, Microbiology, Envl. Chemistry, & G.I.S.; a rainwater harvesting unit & a vermi-composting unit
	Relevant publications and/or research/ innovation products	Ghosh, A.K. & **Bose, N.** The clean water problem: example of arsenic contamination in India, **Innovative Materials & Methods for Water Treatment,** Bryjak, M. et al., CRC Press, 2016; **Amrit, R.;** Floods & Embankments: A case study of River Kosi; National Seminar "Environmental History: New Challenges, New Horizons". Patna, India, 2012.