

CLUSTER 5: Evaluation frameworks to advance WSC transitions

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For water sensitive policies and practices to be effective, systematic monitoring and evaluation is required, at multiple levels and scales, to learn from, understand the experiences of, and financial costs associated with, the different approaches available to deliver WSCs. Investing in building an evaluation culture pays in the long run: evaluations that are insightful and constructive can make significant contributions to system learning and improved performance and decision-making.

There are multiple forms of socio-technical evaluation frameworks appropriate for advancing water sensitive practices. The CRCWSC has already invested in generating insights relevant to designing evaluation frameworks within the spheres of economics, performance assessments and socio-institutional processes – for example:

- 1) economic assessment tools to assist in preparing business cases for investing in WSUD (A1 frameworks);
- 2) frameworks for assessing urban water metabolism, and the performance and risks of WSUD technologies and systems (see, for example, many T1 projects in Programs B and C);
- 3) guiding frameworks for assessing broader social and political processes outcomes of WSUD (e.g. Program A outcomes; WSC Index (D6.2)).

Cluster 5 proposes to extend and synthesise these insights, alongside new empirical evidence to craft evaluation frameworks that capture progress towards, and evaluate the effectiveness of, delivering water sensitive practices in context-specific locations, as well as identifying critical gaps in understanding and practice for future innovations.

Aim(s) and Objectives:

The overarching aim is to: ***“generate and apply a series of nested, inclusive evaluation frameworks which collectively inform key decision-making processes for multiple audiences to advance water sensitive practices.”***

To achieve the overarching aim, the following research objectives will be addressed:

- 1) Adapt and advance existing tools and techniques to support **economic valuations** of key tangible and intangible benefits arising from water sensitive practices to assist with building an evidence base for evaluating these practices and incorporate key indicators into evaluation frameworks;
- 2) Examine internal and external factors that have led to **successful and unsuccessful development of ‘business cases’** for water sensitive projects (local and precinct scale) to unpack how benefits, financing, and risks are conceptualised, presented to, and considered by key/lead decision-makers (i.e. boards of management) which will inform and shape evaluation frameworks (extends T1 insights).
- 3) Develop trusted and understandable **evaluative criteria** (economic factors; process-related; ecological; social; short and long-term; qualitative and quantitative) for monitoring and assessing WSC practices, drawing on insights from T1.
- 4) Explore mechanisms and pathways for **incorporating and synthesising evaluative evidence** and insights from T1 to build, extend and strengthen the narrative for a transition towards more WSCs.

Identified transition needs and research gaps:

In March 2014, Industry Partners highlighted persistent challenges to advancing water sensitive practices including, among others, (i) no urgency for change; (ii) the ‘lessons learned’ are isolated and not well captured (failed to identify and evaluate outcomes); and (iii) those who are investing in change, don’t always see the direct (or immediate) benefits. These points were echoed during Industry ‘needs and opportunity workshops’, which also highlighted the significant role evaluation frameworks should play in **contributing towards advancing the narrative for, investment in, and delivery of a WSC agenda, by guiding the development of a robust evidence-base for assessment, learning and review.**

Delivering a compelling business case remains an ongoing challenge, due to the difficulties associated with identifying, and fully understanding, the broad suite of individual and inter-related economic, societal and

environmental benefits that may emerge, and that these benefits may not be equally distributed. This requires ongoing performance monitoring and timely evaluations; both are core components of 'Adaptive Management', an approach advocated and utilised by key stakeholder organisations; yet there remains limited sector-wide understanding of and capacity for, undertaking systematic, credible evaluations of water sensitive practices. This is due to the complex, interconnected systems involved in delivering WSCs, making it difficult to identify causal relationships, where impacts often lie outside of any one particular piece of technology or stakeholders' influence. There are currently no practical, tailored evaluation frameworks available to organise and interpret monitoring data (qualitative and quantitative) to showcase how individual and collective projects have or have not delivered on advancing water sensitive practices. Evaluation for assessing effectiveness of a WSC will require working within and across organisations and suitable evaluation frameworks may provide a pathway for coordinating action between different agencies and sectors.

Cluster 5 projects will significantly contribute towards the following identified industry needs/opportunities:

Transition Needs/Opportunities	How/what this suite of projects contributes
#2 Shared Vision & Narrative	<ul style="list-style-type: none"> – Evaluation frameworks and economic valuation deliver evidence to inform narrative development and in turn, assists in developing the 'business case'. – Each project will contribute towards building evidence for and analysis of the effectiveness and progress of delivering WSC outcomes – which in turn provides evidence for building narratives.
#3 New economic and financial models	<ul style="list-style-type: none"> – Extends T1 insights/outputs and focuses on providing three tools for estimating benefits, estimating costs, and combining them in a rigorous Benefit: Cost Analysis. This suite of tools will greatly assist end users to conduct more accurate and comprehensive economic analysis of water-sensitive investments.
#4 Robust and inclusive decision-making frameworks	<ul style="list-style-type: none"> – The tools outlined at #3 will provide a robust and comprehensive set that enhances the capacity of end users to undertake economic analysis and build strong business cases. – Identifying further relevant information for Tranche 1 decision-support frameworks – such as Urban Metabolism Framework and aligning the different approaches; – Extending insights from the Evaluation and Learning framework development and the WSC Index.
#6 Holistic evaluation frameworks	<ul style="list-style-type: none"> – This Cluster is in direct response to this broad Transition need.
#10 Monitoring & eval. for improved system design & performance	<ul style="list-style-type: none"> – While distinctions between routine monitoring and periodic evaluation exist, the two activities are highly interdependent. This Cluster will work closely with Cluster 4 (Monitoring) to ensure that the data captured is of relevance and used within the evaluation/valuation frameworks. – Assess how integrated the practice of evaluation is within existing institutional settings.
#14 A culture of learning and innovation	<ul style="list-style-type: none"> – Being engaged in the process of developing and/or undertaking evaluation (i.e. an interviewee, survey respondent) provides reflective opportunity, which supports a learning culture. – Regular evaluation activities signal the importance of learning-by-doing to assess what has worked well, what hasn't, and to uncover promising areas of future practice.
#15 Translation of sharing of WSC Knowledge	<ul style="list-style-type: none"> – Evaluation approaches and evidence derived from evaluation activities can directly improve current work practices and inform capacity building programs, among others. – By having appropriately nested evaluation frameworks helps target the right information/evidence to the relevant audience – ties to Cluster 1
#16 Building community connection and engagement	<ul style="list-style-type: none"> – Engaging community members in the process of evaluation (for e.g. do individuals like/ use/ appreciate/value green infrastructure in their area) provides opportunities for reflection, engagement and awareness raising and may contribute to building broader community connection to the idea of a WSC.
#17 Building capacity to deliver a water sensitive city	<ul style="list-style-type: none"> – Evaluation approaches can be purposively designed such that activities aim to increase motivation, knowledge and skills. Having inter-related evaluation frameworks tailored to context and outcome helps generate relevant insights.

Context and research opportunity

Evaluation frameworks can be used as learning instruments and decision-support tools, to identify key gaps in knowledge and to contribute empirical evidence to support building a narrative for change. Cluster 5 has an integral role in (i) drawing on and synthesising the substantial research insights and various assessment, decision-making, valuation and data models/frameworks produced in Tranche 1 to support

further testing, development and application in context-specific settings (Cluster 2,3 and 4), (ii) to generate fundamentally new insights regarding processes and pathways for embedding evaluation as standard (adaptive) practice; and (iii) to ensure the CRCWSC delivers value from existing investment. The evaluation and learning framework (D6.1) designed to track CRCWSC pathways of influence is a useful starting point, as is the meta-framework for benchmarking WSC (D6.2). For example, the Urban Metabolism Framework (B1.2) is primarily biophysical and there is scope to align water mass balance with insights from smart metering of real-time use/demand (C5.1); and to consider how social/behavioural interventions might influence water demands (A2). Cluster 5 work also complements and strengthens the D1.4 Demonstration and Learning project.

Targeted end-user group(s):

- Each cluster research project would involve key stakeholders in the research process (designing, interviewing; focus groups; testing frameworks etc.), and work closely with industry partners to unpack current practice and help shape evaluation frameworks.
- There is scope to engage the Federal Minister for Cities given recent policy positioning (January 2016).
- Outputs are to be tailored for end-users. For example, the economic valuation frameworks would be designed for end users who don't currently have high-level economics literacy/expertise.
- There are also significant opportunities to work with the Low Carbon Living CRC – and energy service providers - on further promoting water sensitive practices as an essential approach for delivering low carbon, and energy-efficient cities, and embedding evaluative criteria for this within their associated frameworks.

Research Questions and Approach:

Research Question 1: *What is the economic value of WSUD in contributing to urban liveability and what tools are appropriate for capturing this economic value of tangible and intangible benefits arising from water sensitive technologies and practices?*

- **1a Economic tools for end users.** Three tools are proposed: **(i)** a tool for evaluating overall benefits and costs of investments in water-sensitive outcomes, suitable for a range of end users, adapting and building on existing tools (including UK Green Infrastructure and CIRIA BeST) and outputs from Tranche 1; **(ii)** a tool to streamline non-market values estimation using the “benefit transfer” method. This involves extrapolating results from past non-market valuation studies to new contexts. It draws together results from T1, from 1b (below) and extensive evidence from other research; and **(iii)** a tool providing realistic and comprehensive costings for common elements of water-sensitive projects and investments. Tools (ii) and (iii) will provide essential information for inclusion in tool (i).
- **1b The value of liveability.** This project will estimate the economic value of the contributions of water-sensitive urban design to urban liveability. WSUD contribute to: secure drinking and non-drinking water supply; economic and ecosystem benefits by reducing flood risks in urbanised areas; ecosystem and amenity benefits to residents through green infrastructure (e.g. constructed wetlands, rain-gardens and green walls); providing health benefits by reducing urban heat island effects through retaining water in urban environments in open water and wetland systems. In this project, we will use choice experiments and potentially other non-market value techniques to estimate values for different elements of water sensitive urban design. It fills an identified knowledge gap not addressed in T1.
- **1c Effective financing options for WSC.** Adapt and apply innovative methods to capture the tangible benefits, which can be expressed in monetary terms, arising from applying water sensitive technologies and practices. This involves consolidating existing evidence (from original research in Tranche 1 and Project B4 on mainstreaming approaches for adaptation) and extrapolating results from the renewable energy sector, to evaluate the effectiveness of funding sources and financing instruments throughout the transition towards water sensitive cities.
- **1c Economic analysis of priority issues** to support end users. For example, The Water Corp has proposed that the economics team build on work done in T1 to evaluate the economics of selecting appropriate land uses around strategic water resource precincts (including wastewater treatment plants).

Research Question 2: *What criteria should be used to assess the performance and risks of WSUD technologies and systems? Are they trustworthy, credible and context-relevant?*

- Perform an audit of evaluation criteria developed and applied in T1 for evaluating the performance of natural environments and technologies for WSUD, with a focus on those best suited to specific T2 needs/opportunities.
- Characterise key processes used in addressing and accommodating risk profiles of innovative approaches to managing urban water – how are risks presented to and/or understood by lead decision-makers within a range of organisations (e.g. boards, executives of water utilities, developers etc.). This data, captured through in-depth case studies, will examine how successful water sensitive projects (local and precinct scale) evaluated decisions and addressed inherent/potential risks (i.e. environmental, organisational, economic etc.), and coupling opportunities, when making the case for adopting alternative practices (i.e. technologies, planning, servicing) with the idea of discussing this as a platform for bringing actors together.
- Synthesise T1 insights and adapt/extend/apply the ‘Evaluation and Learning Framework’ designed in D6.1, to identify key contributing factors to inform the development of an evaluation framework designed to capture the economic, organisational, social and environmental progress towards achieving water sensitive cities at an individual organisational level (i.e. local government).

Research Question 3: *How can evaluative frameworks (i) inform the development of compelling narratives for change and (ii) support the implementation of adaptive management practices?*

- Building on insights from Question 2, detailed case analyses and insights from T1, identify mechanisms and pathways for incorporating and synthesising evaluative evidence to (i) build, extend and strengthen the narrative for a transition towards more water sensitive cities, and (ii) identify key criteria to support adoption of WSC in formal policy review cycles (state and local) [Close links to Cluster 2 & 4].
- Through multiple cases, work with key proponents of major water sensitive projects (successful and unsuccessful) to unpack how the narrative and business case was shaped focusing on strategies for advocating for innovation, addressing inherent risk profiles and other critical elements. This will build on, extend and further populate the CRCWSCs ‘How to build a Business Case’ document from 2014 and contribute towards refining the WSC Index.
- Draw on causal-process mapping (a developmental evaluation approach) to identify key nodes of change and ‘lines of argument’ to support narrative building.

Intended cluster outcomes and translation/adoption pathways:

Cluster 5 researchers will work closely with end-users throughout the process of developing/testing and applying valuation tools and evaluation frameworks within a context-specific location to advance understanding on the appropriateness and suitability of these tools/frameworks for application elsewhere. Some indicative outputs are:

- Economic tools to support decision-making and, where relevant, the development of business cases for WSUD initiatives in new developments and urban retrofit: (i) comparing costs and overall benefits of water-sensitive investments; (ii) estimates on non-market values for new situations; and (iii) estimating project costs.
- Reports presenting results of economic analyses (i.e. the economic value of enhancing liveability).
- Guidance and recommendations of scale and context-appropriate evaluation criteria for WSUD.
- Guidance and recommendations for adopting (scale appropriate) evaluation frameworks to assess the effectiveness of (i) progress towards achieving a water sensitive city; (ii) policy and planning; and (iii) delivering on-ground practices.
- Compelling narratives that frame the business cases within the social-political context of each city/region, and could create a sense of urgency among decision makers.

Key skills and capacities required

Key contributors to Tranche 1 have many of the relevant skills and expertise required to assist in delivering the anticipated outputs and outcomes of this Cluster. This cluster will require lead senior researchers who are skilled in one or more of the following: non-market valuation; evaluation and learning; risk assessment and have a thorough understanding of WSC concepts.