

Tranche 2 Project Development

Cluster 3: Context Specific Solutions

Cluster Outline

Nominated Cluster Leader(s): TBC; CRO acting cluster leader

1. Cluster Title:

Context Specific Solutions

2. Aim(s) and Objectives:

- Generate integrated approaches for the identification and development of context specific interventions and solutions to address particular challenges and opportunities across a wide range of contextual situations
- Develop and test novel concepts to create effective and efficient interaction and collaboration of different professional disciplines, and organisational entities, achieving optimal solutions for the overall system.

3a. Identified transition needs:

Identified industry needs that this cluster aims to address include:

- #7 Guidance on how to develop context specific solution and (community) asset management regimes
- #8 Achieving multiple benefits through integrated planning, urban, landscape and water system design
- #11 Efficient and effective operations and maintenance systems to achieve water sensitive city outcomes
- #14 A culture of learning and innovation
- #16 Building community and industry connection and engagement
- #17 Building capacity to deliver a water sensitive cities

The activities in this cluster will also directly link to the outcomes/activities under the following needs:

- #4 Robust and inclusive decision making frameworks
- #6 Holistic evaluation frameworks to support water sensitive city investments
- #9 Next generation of flood risk assessment frameworks and tools for a water sensitive cities approach
- #12 Coherent understanding of groundwater systems and interactions with surface waters

3b. Research Gaps:

Most professions and research disciplines have developed a high level of proficiency and experience in addressing challenges within their own sector or discipline. However, this typically generates 'optimal solutions' within each sector, which is not often the optimum for the entire system. Many of today's major challenges are at the interfaces of, or even across many sectors and disciplines, which requires a different approach to research and implementation of 'system-optimal' solutions.

Some of the key research gaps/questions are therefore:

- How to effectively identify and prioritise interventions and solutions that can address challenges and opportunities in their specific context and create 'system-optimal' outcomes?
- How to create a structured approach to successfully integrate knowledge and tools of different research disciplines/professions to address complex practical challenges across different organisational entities, jurisdictions and situational constraints?
- How to develop novel solutions that achieve multiple benefits at conceptual and practical levels?
- How to better learn together (from different disciplines and organisations) and apply the knowledge in practical situations?
- How to best capture learnings and disseminate them to other, related contexts?

4a. Context:

To identify and address practically relevant solutions in an integrated approach, a range of different contexts has to be considered. These include, but are not limited to, the following factors:

Environmental:

- geographic situation
- climatic conditions and expected variations/extreme events
- geological and environmental constraints and opportunities
- hydrologic conditions (groundwater, stormwater, flooding, etc.)
- ecological values and benefits
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Social/structural

- demographic situation and expected changes
- socio-economic conditions and developments
- social coherence and community structures
- political, legal and jurisdictional situation
- institutional and governance arrangements
- industrial and professional capacity
- historic and cultural significance
- infrastructure and technology changes/developments

Scale:

- spatial scale (small in-fill situation to large green/grayfield sites)
- urban density (single dwellings per site to dense high-rise structures)
- organisational scale (single developments to regionally integrated solutions)
- temporal scale (short-term implementations/solutions to decadal transitions)

4b. Research opportunities:

- Methodologies and approaches to achieve adaptable and/or resilient planning, development and implementation strategies, recognising that contexts are dynamic
- Identifying and creating system-optimal solutions and quantifying the achievable benefits across multiple beneficiaries
- Innovative concepts and tools for the integration and adaptation of different disciplines and organisations to achieve novel solutions, in areas such as (eg.):
 - effective integration of new technology developments into existing infrastructure (extending asset life, increasing capacity, improving performance achieving additional benefits, etc.)
 - developing innovative urban heat mitigation strategies with multiple benefits (health, amenity/livability, energy/water efficiency, stormwater mgt, etc.)
 - creating new approaches for effective community involvement in design, implementation and operation of novel solutions across many contextual aspects.
- Processes that enable planning, design and implementation of integrated, system-optimal solutions across different spatial and temporal scales
- Guidance on how to effectively integrate knowledge and tools across different research and practice disciplines and professions
- Improved knowledge sharing and innovative concepts to enable joint learning processes and capacity building
- Strategies and methodologies for capturing learnings and disseminate them to other contexts

5. Targeted end-user group(s):

Given the breadth and wide-ranging scope of these cluster activities, there are elements for just about any type of end-user group to actively participate in and benefit from these developments.

In particular, key end-user sectors that will need to be engaged in (some of) these activities include:

- public and private water utilities;
- engineering consultants and technology providers;
- urban planners;
- urban/landscape designers and architects;
- development industry;
- local councils;
- local communities;
- etc.

6. Research questions and approach:

As the proposed activities under this cluster are highly diverse and need to be adapted to each specific context and interfacial challenge situation, it is at this stage not feasible to determine specific research questions or approaches across all potential options. These elements will need to be developed for each project-specific context and needs during the project proposal stage.

7. Intended cluster outcomes and translation/adoption pathways:

The nature/type of most outcomes of this cluster will be highly dependent on the specific project contexts and the related cluster elements that are being applied within these projects. Similarly, the translation/adoption pathways will be dependent on these project-specific situations.

Nevertheless, there are some generic outcomes expected from these activities, which relate more to the methods and approaches to develop these context-specific solutions being developed in each project/situation. Therefore, expected key outcomes will be:

- Methods and approaches to create system-wide integrated solutions across many different structures and situations
- Framework for effective collaboration of different research disciplines, professional sectors and organisational entities to address complex, interfacial problems
- Novel learning and knowledge sharing concepts and pathways to foster ongoing innovation, adoption and capacity building across many industry sectors.

8. Key skills and capacities required:

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