



Developing a typology of climate change adaptation actions

Workstream 1: Methodology presentation
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Introduction

- South African population will grow by an additional 19 to 24 million by 2050 (Green Book, 2019).
- Growing cities will also be impacted by global climate change and continued changes in extreme events.
- Processes such as urbanisation converge with climate risk in settlements, creating highly vulnerable spaces and communities.
- As the level of governance closest to the people, municipalities have to deal with these vulnerable spaces and communities (Pieterse, Van Niekerk, & Du Toit, J, 2018).

“

Climate change adaptation is the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects. – IPCC, 2014

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Purpose

- This research presents a first attempt at the development of a typology of locally relevant planning and design actions that can be used to adapt South African settlements to reduce their vulnerability to climate risks and to exploit opportunities for sustainable development.
- The aims of the adaptation actions contained in the typology are
 1. to avoid or minimise the expected impacts of climate hazards,
 2. to restore and maintain systems to be more resilient to future changes, or
 3. to retrofit infrastructure to reduce future impact or loss.



Methodology

- The development of the typology followed an iterative process where a menu of adaptation actions were reviewed and refined to reflect knowledge gained through further research and engagement of stakeholders and experts.
- The methodological process to develop a typology of adaptation actions:
 - a) Content and literature search
 - b) Defining climate change adaptation for settlement planning
 - c) Developing selection criteria
 - d) Developing categories and a range of attributes
 - e) Linking adaptation actions



a. Content and literature search

- Identify and assess relevant journal articles, reports and adaptation plans.
- This was done according to a set of themes and fields relevant to climate change adaptation within South African settlements.
- For each field an analysis was done of the climate change adaptation options and measures available and relevant to settlement planning and design – captured in a tables.

ADAPTATION OPTION	Adaptation option title
Which impact/risk does this adaptation option address?	Indicate the risk that this adaptation option will address, e.g. flash floods.
Provide a detailed description of the adaptation option.	Provide as much detail as possible about what the adaptation option entails.
What are the goals this adaptation option aims to achieve?	Including how it may mitigate greenhouse gas emission and/or reduce disaster risks where relevant.
With which sectors or cross-cutting themes does the adaptation options overlap?	
Is this a high-or low cost and resource option? What resources will be required to implement this adaptation option?	Describe the physical, economic, financial, environmental, and/or human resources that will be required to implement the option.
Adapting to climate change is not only negative but also holds many opportunities. What are the opportunities, benefits and spin-offs of the adaptation option? What other developmental issues does it address?	Describe the social, economic, political, and environmental opportunities, benefits, and/or spin-offs.
What are the negative impacts and implications of the adaptation option?	Describe the social, economic, political, and environmental impacts, implications, costs and risks.
Provide appropriate local and international examples and good practices of this option.	Describe such examples and good practices in detail.
How has this option performed in other places?	
Other	

b. Defining climate change adaptation for settlement planning

- This definition was needed to set limits to the development of the typology.
- Climate change will have impact across scales and systems.
- A multi-faceted approach is required to choose appropriate adaptation actions for settlements.
- The municipal planning functions that relate to the scales and the impacts of climate change are spatial planning, land use management, landscape- and urban design, infrastructure and engineering service provision, and environmental planning.
- These functions address or are able to influence climate change adaptation across the relevant scales and urban systems.



c. Developing selection criteria

- Adaptation actions need to:
 - a) Be linked to the mandate of local government;
 - b) Be suitable for urban and built-up areas;
 - c) Fit a local planning function i.e. spatial planning, land use management, landscape- and urban design, infrastructure and engineering service provision, and environmental planning;
 - d) Support good planning principles;
 - e) Support climate change mitigation where appropriate; and
 - f) Provide an economic, social or environmental benefit regardless of climate change.



d. Developing categories and a range of attributes

- Local planning function
 - Spatial planning
 - Land use management
 - Landscape- and urban design
 - Infrastructure and engineering services provision
 - Environmental planning
- Climate change adaptation type
 - Reduce impact
 - Reduce exposure
 - Support response
- Climate change adaptation strategy
 - Win-win
 - No-regrets
 - Low-regrets
- Meteorological climate hazards and impacts
 - Wildfires
 - Inland flooding
 - Coastal flooding
 - Heat stress
 - Drought
 - Extreme wind speed
 - Groundwater depletion
 - Surface water depletion
 - Biodiversity loss



e. Linking adaptation actions

- Isolated adaptation actions are less likely to be effective.
- Municipalities should ideally develop and compile a 'basket' of measures that is suitable to the context
- Related and mutually beneficial or supportive adaptation actions were linked using a matrix to create 'baskets' of actions that can be implemented together across scales, sectors and systems.



Through the process a final 81 distinct adaptation actions were categorised into four categories, one of which consists of mutually exclusive attributes, and three categories with intersecting attributes.

Results

Mutually exclusive category	Intersecting categories		
Planning Function	Adaptation Type	Adaptation Strategy	Climate Hazard and Impact Addressed
Spatial planning Land use management Landscape- and urban design Infrastructure and engineering service provision Environmental planning	Reduce impact Reduce exposure Support response	Win-win No-regrets Low-regrets	Wildfires Inland flooding Coastal flooding Drought Heat stress Extreme wind speed Groundwater depletion Surface water depletion Biodiversity loss

Conclusion

- Local government plays a key role in climate change adaptation because successful responses depend on local policies, plans and processes.
- To facilitate the mainstreaming of adaptation as a means of creating more resilient settlements, it is necessary to link climate change adaptation to settlement planning.
- A one-size-fit-all approach is not appropriate for either settlement planning or for climate change adaptation.
- The Green Book does not prioritise adaptation actions for each settlement and it is the responsibility of each local municipality to select the most appropriate actions to be integrated into their local planning strategies, plans and processes.



References

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