

Ecosystem-based Adaptation: a Guiding Framework for decision- making criteria

This “Guiding Framework” for Ecosystem based Adaptation (EbA) decision-making was developed during the course of innovative process that culminated in a 3 day workshop entitled, “Ecosystem-based approaches to building resilience in urban areas: making the case for a framework for smart decision-making criteria”. The project was funded by the Climate and Development Knowledge Network (CDKN) Innovation Fund II, and implemented by ‘ICLEI – Local Governments for Sustainability – Africa’ in partnership with eThekweni Municipality’s Environmental Planning and Climate Protection Department.

1. Introduction

Addressing the effects of climate change at the local level is critical to saving lives and livelihoods as well as to maintain social and economic well-being. It is imperative for each urban entity to actively engage in proactive local level planning, to ensure the best fit for Climate Change Adaptation (CCA); robust and bold adaptation measures are needed. While there is quite simply no generic approach to CCA at the local level, since every urban environment in the broadest sense is unique, there is recognition of the need for direction around adaptation actions. This is particularly so for the even newer field of work around utilizing ecosystems and natural infrastructure to reduce vulnerability and risks in an increasingly uncertain climate. Ecosystem based approaches are not well defined nor typically within the usual jurisdiction of the local authority that depends or impacts on them, incorporating decision-making around ecosystems can be complex. The spectrum of approaches includes both practical actions and also developing institutional capacity to respond.

Cities and development partners are also increasingly making large investments in CCA. To plan, implement and track the interventions in which they are investing, the cities and development partners need robust assessments, of both the expected as well as the actual returns.

Urban Ecosystem-based Adaptation in Africa

Ecosystem services are a critical foundation of livelihoods for a significant portion of people in African cities.

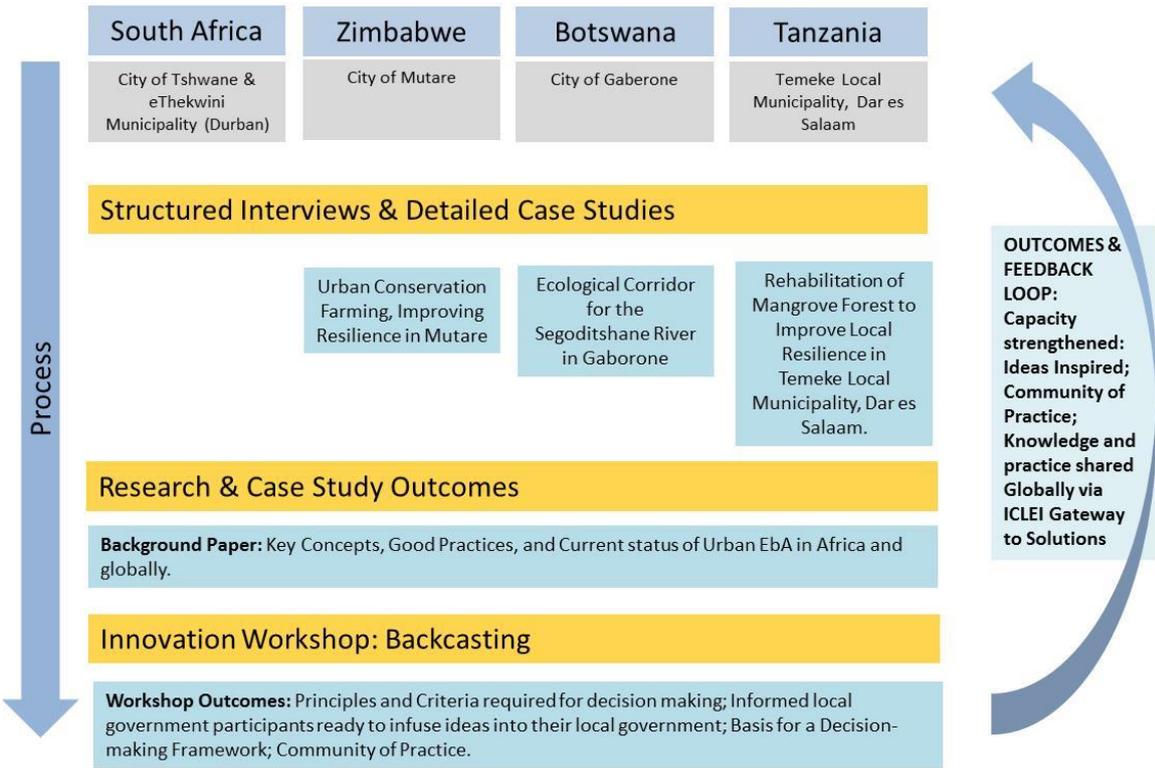
Long-term stresses such as environmental degradation impact the supply of ecosystem services and worsen the impacts of climate change and systemic shocks, such as floods and drought. The urban poor are usually most directly affected by these impacts and shocks, which further undermine individual and community-level adaptive capacity, escalate inequality and worsen poverty. Improved urban resilience in general, disaster risk reduction, water, food and energy security and the provision of other urban services in the context of the impacts of climate change are directly dependent on sustaining essential ecosystem services. Ecosystem-based adaptation (EbA)¹ uses biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change.

2. Reflexive learning for building urban resilience through EbA

Climate change adaptation, and particularly EbA, is an ongoing process of institutional and social learning through which institutions, agents and communities can improve resilience through an enhanced understanding of risk, vulnerabilities and the effectiveness of adaptation strategies. The ICLEI Africa project, a four-month long innovation process, *“Ecosystem-based approaches to building resilience in urban areas: making the case for a framework for smart decision-making criteria”*, sought to create such a focused institutional learning opportunity. The project engaged a group of practitioners from different government sectors representing five African cities – City of Tshwane and eThekweni Municipality (South Africa), City of Mutare (Zimbabwe), City of Gaborone (Botswana) and Temeke Local Municipality, Dar es Salaam (Tanzania) – to explore a decision-making framework that would be helpful in guiding decisions regarding ecosystem-based approaches in local adaptation strategies and projects.

This document outlines the steps of the guiding framework that emerged from this innovative process. Intended to serve a useful reference for local government officials, it can be used to structure the process of evaluating options for implementing, monitoring and evaluating ecosystem based adaptation actions – in other words it serves to inform decision-making and is a performance management tool.

Figure 1. Project Process and Key Outcomes



A Background Paper, “Ecosystem-based approaches to building resilience in urban areas: towards a framework for decision-making criteria”, describing key concepts and good practice was compiled as an information base to inform an intensive three-day workshop with participants to explore a framework for decision-making criteria for EbA. During both the project process and the workshop, participants were engaged in discussions on a framework for informing decision-making on EbA. This engagement was informed by the best practice research undertaken for the Background Paper and the collective knowledge of the participants and experts at the workshop. These inputs all inform the emerging framework, which consists of a broad, overarching set of principles as well as criteria that are focused on assessing relevance and effectiveness of EbA interventions.

It was concluded that a set of contextually derived indicators developed at the local level, rather than generic technical indicators, are needed to shape EbA in a wide variety of settings. The value of this innovative process was that it developed the **building blocks of a framework** for decision-making around ecosystem based approaches that serve to assist leaders to understand:

- i) when such approaches are appropriate,
- ii) how to compare them to other approaches;
- iii) how to assess their effectiveness over time;
- iv) whether adaptation is enabling development despite climate change effects and whether CCA costs and benefits will be equitably distributed;
- v) whether there are co-benefits and triple wins (social, environmental and economic); and
- vi) whether adaptation will reduce poverty and increase socio-economic development opportunities.

3. How to use this document

For a local government wanting to know more about EbA, how to assess and monitor actions and how to create an enabling environment for implementation, this report presents the building blocks of an evaluative framework for guiding decisions in respect to ecosystem-based approaches in local adaptation strategies and projects. To guide you in this process we refer you to the comprehensive Background Paper <http://archive.iclei.org/index.php?id=13422> that includes a list of valuable briefing and reference material, as well as to the Newsletter, which outlines the process: <http://archive.iclei.org/index.php?id=13422>.

We suggest that officials can reflect on the guiding questions and can consider the principles and assessment criteria template presented to help you run through this process. Running this assessment process as a 1-2 day workshop with an external facilitator is advised. Participants should ideally include decision-makers and practitioners from different sectors such those from environment/natural resource management, spatial planning, disaster management, water services, waste management and coastal management. Please contact ICLEI Africa for further advice on how to run the discussion process.

During the workshop engagement process you could consider:

1. Reviewing the objectives to aim for (high level objectives are included below) Do these objectives work in practice and what additional/alternate objectives would your city have?
2. Using the guiding questions outlined below to help frame the discussion process.
3. Use the Guiding Framework to help assess some of the key factors of the EBA process and the next steps.
4. Using tailored facilitation techniques to support the process e.g. back casting, open space discussions, elements of the U-process etc.
5. Expected outcomes of the workshop will be a context specific framework for planning, implementation and monitoring EbA.

4. EbA opportunities for African cities

The African continent is warming at double the global average, and the responding changes in rainfall and precipitation, in particular, are potentially devastating. The rapid rate and mode of expansion of Africa's urban areas is contributing to an increasingly vulnerable urban poor. Local government is the sphere of government which must respond to citizens when they are flooded, lacking basic services and requiring urgent disaster risk responses, and it is at the local level that the majority of costs of adaptation responses will be borne.

Urban Ecosystem-based Adaptation strategies provide “low-” and “no regret” pro-poor adaptation opportunities to African cities. Large numbers of Africa's urban poor rely significantly on natural resources and ecosystems for basic services. These systems and resources are increasingly under threat due to their under-valuation in current urban service delivery models and through the impacts of climate change.

The trend of significant growth in the demand for services within urban informal peripheries **requires “game-changing” approaches to reduce the vulnerability of the urban poor.** In striving to meet the Millennium Development Goal targets and post-2015 Development Agenda, urban service delivery models will need to be feasible and sustainable in the informal urban periphery.

Durban Adaptation Charter for Local Governments

The Durban Adaptation Charter (DAC) for Local Governments developed at the UNFCCC COP 17 (United Nations Framework Convention on Climate Change Conference of Parties) calls upon local and sub-national governments, under ten principles, to scale up and accelerate their adaptation efforts and to mainstream adaptation in all local development planning.

This project is one such step on the path to assisting local governments to implement actions under principle six of the Durban Adaptation Charter: ***“6. Prioritise the role of functioning ecosystems as core municipal green infrastructure... We will ensure that sustainable management, conservation and restoration of ecosystems and the related ecosystem services are used to enable citizens to adapt to the impacts of climate change, which is known as Ecosystem-based Adaptation (EbA). We will strive to maintain and, enhance resilience and reduce the vulnerability of ecosystems and people to the adverse impacts of climate change.”***

Without romanticising informality, urban development practitioners need to accept that it is not a passing phase but rather the context within which a rapidly growing urban population require basic urban services. Rather than attempting to roll-out urban service delivery and large-scale infrastructure models that only work in the inner-city areas and effectively obliterate functional ecosystems, consideration could be given to locally-maintained, smaller scale “soft” infrastructure alternatives that use ecosystems to deliver urban services, in both the informal and formal periphery.

“Transformative”¹ EbA responses may provide opportunities to implement such urban service delivery models. Further, consideration given to localised models for infrastructure provision and to maintenance could have significant potential for sustainable job creation and significantly enhance community-level adaptive capacity. Some examples are listed below (more are available in the Background Paper and related links):

1. Alternative approaches to delivering storm water management and road infrastructure, which employ local people in construction and maintenance, could sustain ecosystem services and provide cost effective service delivery as well as improve the adaptive capacity of communities in the informal urban periphery and more formalised areas.

2. Through the clearing of water intensive invasive alien trees the South African ‘Working for Water’ program and the ‘Working for Wetlands’ program, which looks at the rehabilitation, protection and sustainable use of wetlands, have demonstrated improved water yields, water quality and biodiversity in landscapes, and are having immediate benefits for wage employment of rural communities, as well as restoring biodiversity and water yield.
3. Developing open space systems within cities can significantly contribute to reducing the “urban heat island effect”, with direct positive impacts on human health and well-being is in addition to a host of other potential benefits such as improved storm water management.
4. Land provision for urban agriculture that employs conservation farming methods and which depends on and actively protecting ecosystem services, could increase local food security and result in a range of other livelihood co-benefits.

¹ Adaptation to climate change has largely been seen to be a process of incrementally adjusting to new conditions, stresses and natural hazards. This is often not enough. Transformative approaches call for far deeper changes in society – “for novel or dramatically enlarged adaptations, the reorganization of vulnerable systems or changes in their locations... Although many transformative adaptations are technological, they are also behavioral, affecting how individuals and society make decisions and allocate resources to cope with climate change. They may alternatively include fundamental changes in institutional arrangements, priorities, and norms.” Ref: Kates, R.W., Travis, W.R., and Wilbanks, T.J. (2012) “Transformational adaptation when incremental adaptations to climate change are insufficient”, PNAS Early edition. Available at: www.pnas.org/cgi/doi/10.1073/pnas.1115521109 Accessed: 14 November 2013.

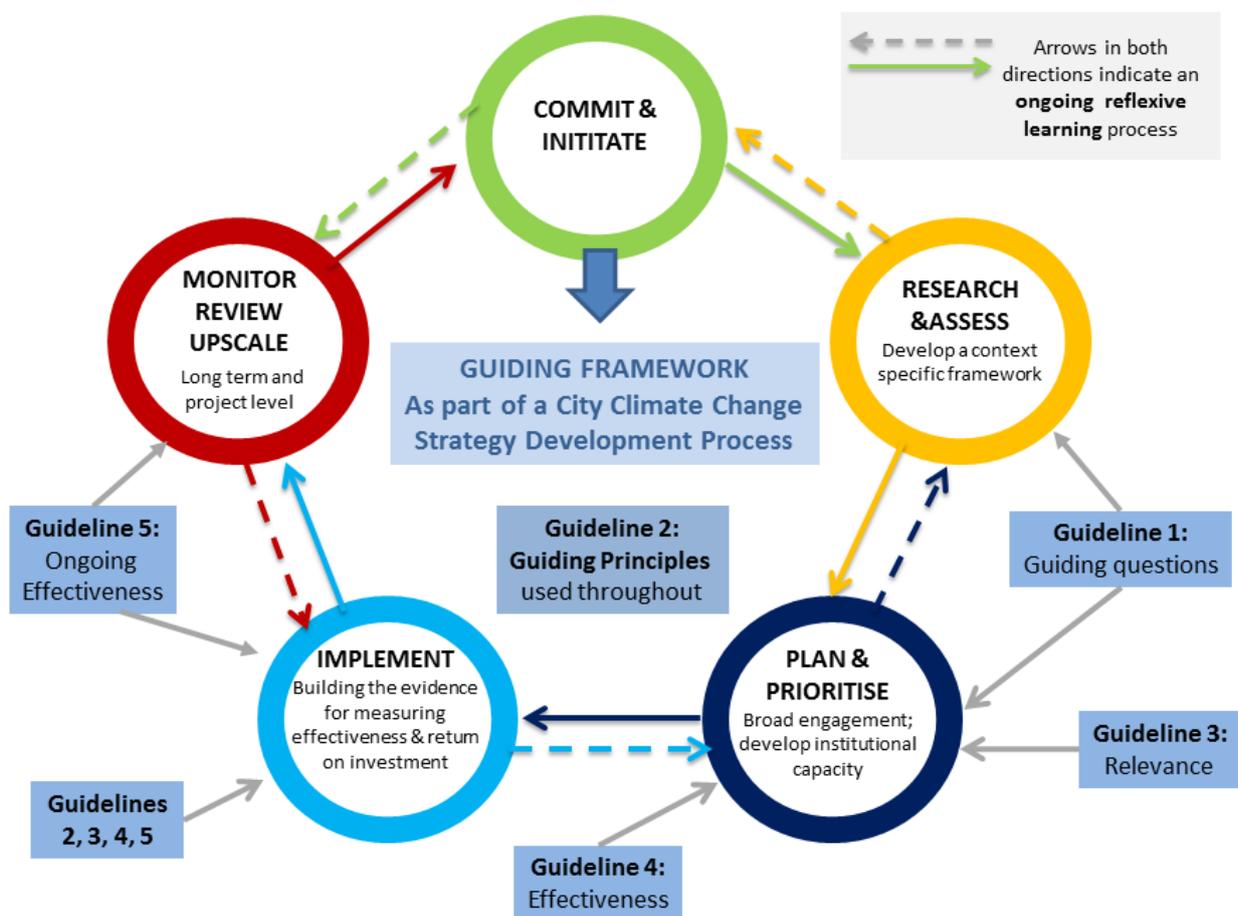
- “Closing the loop” strategies, for example, using the assimilative services of soils and ecosystems in the utilisation of grey water or partially treated water for urban agriculture can work hand in hand with some of the strategies identified above.

Decision-making for EbA should occur within an integrated local-level adaptation and mitigation climate change response strategy. Further, as the implementation of the Durban Adaptation Charter is supported over time, it is likely that a common framework will be developed for informing and measuring the success of local-level adaptation responses. The outputs from this project for EbA responses and those developed by the DAC generally, will inform each other.

5. Guiding framework for decision-making: principles and criteria

CCA planning is not a linear process, but an ongoing reflexive learning process. The following is a set of guidelines that can be used throughout the stages of planning, implementation and monitoring. They provide a useful set of principles and criteria to reflect upon, allowing for a context specific evaluation process of both EbA actions and institutional processes.

Figure 2. A Guiding Framework to inform decision-making and to measure “are we doing the right things” and “are we doing things right?”.



GUIDELINE 1: Guiding Questions for considering EbA Approaches

While there are a range of guidance documents available to assist in the planning and design of local-level adaptations strategies, the following are an example of some of the guiding questions that are **useful starting points** in identifying the ecosystems and ecosystem services that could be the focus of EbA interventions:

1. Country context for climate change adaptation
 - a) What is the climate change impact being considered and what are the consequences for critical sectors and services in the city?
 - b) Is there local-level monitoring of national programmes for climate change adaptation?
2. City-level impacts attributed to climate change
 - a) What will happen to key services such as food, water and energy supply, storm water drainage, sanitation, health services, etc? Who will be most affected?
 - b) Is the city currently experiencing impacts from climate change? For example, have you noticed a change in the intensity or frequency of flood or drought events?
3. City-level initiatives addressing climate change adaptation directly
 - a) Is there local-level monitoring of national programmes for climate change adaptation?
 - b) Are there planned responses to the impacts of climate change? If so what are the policies, strategies, programmes and plans in place?
4. City-level initiatives to address disaster risk reduction
 - a) Are there City-wide vulnerability assessments?
 - b) Are there City-wide disaster/risk response strategies?
 - c) What are perceived as the most significant risks to the city from climate change in terms of potential disasters, e.g. flooding, drought, food security, energy supply disruption, etc.?
5. City-level initiatives to protect ecosystems and biodiversity
 - a) How are local government-led services supplemented by ecosystems and ecosystem goods and services?
 - b) Can ecosystem services be maintained, enhanced or restored?
 - c) What are the available options for maintaining, enhancing or restoring ecosystem services? Has the City developed any initiatives which use biodiversity and ecosystem services as an adaptation strategy?
 - d) Have any of the ecosystem-based adaptation initiatives been focused on addressing poverty reduction or job creation or ensuring reduced vulnerability for the urban poor?
6. Mainstreaming
 - a) To what extent do the City development plans and strategies integrate/respond to the potential impacts of climate change, mitigation strategies and adaptation strategies?
 - b) To what extent does day-to-day decision-making in the City consider the impacts of climate change and the need to adapt appropriately?

7. Institutional Capacity

- a) Is there dedicated human capacity allocated to developing strategies and implementing climate change adaptation? Is there a department or individual or committee established for this role?
- b) Do city plans (both spatial and strategic) sufficiently address climate change adaptation? Have the potential ecosystem-based adaptation strategies been identified?
- c) Is there sufficient political will to address climate change adaptation and is ecosystem-based adaptation seen as having significant potential to increase resilience?
- d) What is the most significant barrier to effectively addressing climate change adaptation?

GUIDELINE 2: Guiding Principles for informing EbA Approaches

The following are overarching principles that could **inform the process of planning** for EbA responses that contribute to climate compatible development, whether they are aimed at Delivering Adaptation Actions (DAA) - i.e. *practical actions* to reduce vulnerability to climate risks and exploit positive opportunities, or Building Adaptive Capacity (BAC) – i.e. developing *institutional capacity* to respond to the risks posed by climate change:

- Relevance – focusing on interventions that are appropriate within the context;
- Equity – addressing poverty and promoting justice across sectors;
- Participation – engaging stakeholders who are the relevant agents for effective implementation;
- Feasibility – ensuring planned interventions are realistic within the context, capacity and resources of the target institutions and communities;
- Transformation – fundamentally shifting the ways in which development is planned and implemented to take account of the global forces and local change;
- Maximises synergies between multiple environmental, economic and social goals contributing substantially to the overall resilience of a city
- Disruption – engaging processes or innovations in technology, development or service delivery that create new value chains or ways of producing goods and or services that disrupt maladaptive practices;
- Learning – building knowledge and institutional and community adaptive capacity in the context of uncertainty and change;
- Flexibility – embracing uncertainty and evolving knowledge with the capacity to adapt strategies to incorporate learning and innovation;
- Effectiveness – achieving the desired or planned objectives of EbA towards climate compatible development;
- Efficiency – addressing agreed acceptable levels of risk in a resource-efficient manner; and,
- Sustainability – sustaining the benefits in the longer term or sustaining the gains beyond the lifespan of a funded intervention.

GUIDELINE 3 – Criteria for assessing RELEVANCE of EbA interventions

Assessing the effectiveness of an EbA intervention depends on the achievement of its objectives and on the relevance of those objectives to the context in which activities take place. (For more information see the Background Paper).

The relevance of EbA approaches can be assessed using the following criteria¹. Relevant EbA interventions should thus:

- Reduce existing socio-economic vulnerability (goes beyond the response to the specific crisis or risk by maximizing synergies between multiple environmental, economic and social goals: livelihood improvement; job creation and greater food security)
- Enhance climate change and disaster risk management policy and planning through identifying and targeting the conservation of multiple ecosystem services;
- Provide value for money and/or efficiency through contributing to multiple co-benefits for human systems and natural systems by supporting urban service delivery and local development priorities;
- Improve direct biophysical resilience to anticipated hazards/extreme events; and,
- Reduce the likelihood of inducing or encouraging maladaptive behaviour or results.

Engagement of the participant cities within the project process supports the findings of good practice: the effectiveness of an EbA intervention depends on the achievement of its objectives and on the relevance of those objectives to the context in which activities take place. Overall, *successful strategies* ensure the continued supply of goods and services of particular importance to the world's poor and most vulnerable, in the form of income and shelter, but can also be highly significant to populations that may not be considered particularly vulnerable.

GUIDELINE 4 – Criteria for assessing EFFECTIVENESS of EbA interventions

The effectiveness of EbA approaches can be assessed using the following criteria. Effective EbA interventions should thus:

- Promote the resilience of both ecosystems and societies, including livelihoods;
- Use comprehensive nature-based solutions for populations that are particularly vulnerable due to socio-economic and/or climatic conditions, and/or those that are particularly reliant on natural systems for their basic needs and well-being;
- Generate social and economic benefits regardless of climate change impacts (i.e. be no-regret or low-regret options) and address poverty alleviation and job creation where possible;
- Produce development and environmental co-benefits beyond the scope or scale of a specific intervention, such as resulting in emissions reductions, carbon credits, improved environmental quality, increased raw material, improved ecosystems services, etc.;
- Complement other adaptation measures and be an integrated element of a local-level climate change response strategy, which include mitigation and adaptation; and,
- Include the consideration of ecosystems beyond the city or urban boundary that deliver critical urban services.

GUIDELINE 5 – Additional criteria for assessing ONGOING EFFECTIVENESS of EbA interventions

Beyond the above criteria for relevance and effectiveness, the following criteria are critical to the ongoing success of EbA initiatives:

- Potential for replication and expansion/scaling-up based on rigorous planning, monitoring and evaluation;
- Long-term mainstreaming into local-level policy and strategic and spatial plans and budgets;
- Embedded and dedicated implementation capacity within relevant institutions and community-level structures.

5. Conclusions

Performance management for EbA outcomes and results is a particularly challenging arena, specifically in the context of attribution, cause and effect relationships between the intervention and the results and outcomes measured. Critical as a starting point is a robust baseline against which progress and the results can be measured.

While there is an increasing evidence base for the utility of ecosystem-based approaches, mostly focused on rural areas rather than urban areas, there are intrinsic challenges to quantitative measures within complex ecological systems. There is also uncertainty regarding the capacity of ecosystems to continue to deliver adaptation services in the context of the impacts of climate change and other transformation or degradation of these systems – i.e. thresholds within which these services can continue to be delivered. Finally, providing quantitative cost-benefit analyses of EbA versus alternative or hard infrastructure options is particularly challenging, not only because of the difficulty of quantifying effects, but also because, providing a monetary value to ecosystem services is not always possible, or desirable.

Acknowledging all of the challenges with being able to provide quantitative measures of effectiveness, direct attribution or return on investment, EbA can provide low or no regret interventions, with a host of significant potential co-benefits due to built-in flexibility of ecosystems and the direct engagement of beneficiaries and other stakeholders.

As urban local authorities explore EbA responses, it will become increasingly important to ensure that the strategies employ good practice in terms of decision-making for selection of interventions as well as and monitoring and evaluation to assess effectiveness. The latter should be approached at two levels: long-term and project-level monitoring and evaluation. Both will contribute to building the evidence to support improved decision-making for EbA as an integral component to urban climate adaptation strategies.

There is a growing body of guidance literature and project databases which can assist in planning EbA interventions and identifying indicators that can be adapted to context specific conditions. However, while local governments are “learning by doing” it is useful to work towards a common framework of criteria for decision-making for EbA. The two critical areas that were identified for robust planning and monitoring and evaluation are “relevance” and “effectiveness” of EbA interventions. Using a common framework within a community of practice can provide a helpful focus for ongoing reflexive learning² on

² Defined as learning from experience in order to shape or reassess goals, methods as well as resource use shaping adaptive strategies at the local level. Adapted from Pelling, M., High, C., Dearing, J. and Smith, D. (2008). Shadow spaces for social

planning for and evaluating the results and impact of EbA initiatives. A framework can also assist in learning about relevance and effectiveness within varying implementation contexts and thereby build the reflexive competence³ of practitioners at the local level and contribute to the enhanced adaptive capacity⁴ of local-level institutions.

Interested in finding out more?

For a city official wanting to know where to seek guidance on EbA approaches, the Community of Practice for adaptation hosted on the Durban Adaptation Charter (DAC) website will offer a portal for information sharing. Part of this will include a blog page whereby there will be monthly blogs that provide the thematic discussion points for the community of practice which will be run through LinkedIn and Twitter feeds. Future engagements with cities around EbA will serve to carry forward and improve the framework as it tested and ground-truthed.

For development partners, researchers and other interested parties interested in collaborating and mobilising resources to support local governments in this field of work please contact ICLEI Africa.

For more information please contact ICLEI Africa: www.iclei.org/africa and iclei-africa@iclei.org

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learning: a relational understanding of adaptive capacity to climate change within organisations. *Environment and Planning*, 40(4) pp. 867–884.

³ The demonstrated ability to integrate performances with the understanding of the challenges so in order to adapt to changed circumstances and explain the reason behind these adaptations.

⁴ The set of resources (natural, financial, institutional or human, and including access to ecosystems, information, expertise, and social networks) available for adaptation, as well as the ability or capacity of that system to use these resources effectively in the pursuit of adaptation.