South African CitiesNetwork

CITIES AND CLIMATE CHANGE

BUILDING RESILIENCE

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A sustainable city is one that meets its developmental responsibility in a sustainable, spatially transformed and resource-efficient way, taking into account environmental thresholds.

EFFECTIVE CLIMATE CHANGE RESPONSE IS A COMPONENT OF A SUSTAINABLE CITY.

CITIES AND CLIMATE CHANGE

Climate change is hitting South Africa hard. Summer rainfall areas are becoming drier than ever, and drought is plaguing parts of the country. With the significant drop in dam levels, urban areas are experiencing chronic water shortages. The growing water crisis affects the population, crop yields and livestock. This in turn has an impact on food security, especially of those who are already impoverished and unable to adjust to food inflation.

To stimulate thinking on what cities should be doing to address the impact of climate change, the South African Cities Network (SACN) commissioned a study[1] that analysed the effectiveness of climate change resilience systems in three cities:

EKURHULENI

JOHANNESBURG

MANGAUNG

This brochure illustrates the impact of climate change on food security, transportation and water provision, and offers some guidance on how cities can respond to climate change.

An effective climate change response requires an integration of global, national and local policies.

1. SACN. 2014. Synthesis Report: An Analysis of Cities Resilience to Climate Change with Particular Focus on Food Security, Transport and Water Provision. Johannesburg: SACN.

IMPACTS OF CLIMATE CHANGE

South Africa is a water-scarce country with a highly variable climate. Climate change is making the situation worse, causing severe storms, flash floods, changing rainfall and weather patterns, extreme temperatures and droughts. These climate change impacts are affecting food security, transportation and water provision, among others. Food security is highly dependent on the water and transport sectors, and this interlinkage emphasises the integrated nature of climate change.

TRANSPORTATION

Flooding negatively affects the road infrastructure and is exacerbated by poor and aging storm-water drainage. Yet across cities budgeting for and spending on maintaining infrastructure remain low. In addition, flooding has socio-economic impacts, as it disrupts mobility especially in low-lying and inappropriately located settlements, resulting in lost income.

Flooding

↓

landslides, damaged infrastructure (roads, rail, tunnels)

↓

transport and construction delays and disruption

↓

high repair and maintenance costs and impact on economy

Shifting temperatures/rainfall patterns and extreme weather events

↓

lower crop yields and higher food prices

↓

socio-economic and health impacts (including child malnutrition)

↓

higher health expenditure by cities

FOOD SECURITY

Social upliftment and the creation of healthy and sustainable communities rely heavily on the capacity of a community to source or produce food locally. Climate change threatens both large-scale food production and local-level urban agriculture, which depend on favourable weather patterns to thrive. The reduced ability to produce food locally forces communities to access food from supermarkets, which may be costly for vulnerable households.

WATER PROVISION

South Africa's water system is already under severe stress, which will be worsened by the increased climate variability. Common to all three cities is the high risk facing water provision, as increased temperatures imply increased water usage, which places pressure on existing city water reserves. At the same time, reduced rainfall and drought may result in shrinking dams and reservoir water levels, affecting agriculture, society and overall economy.

Changes in rainfall patterns

↓

droughts and floods

↓

increased sedimentation in dams

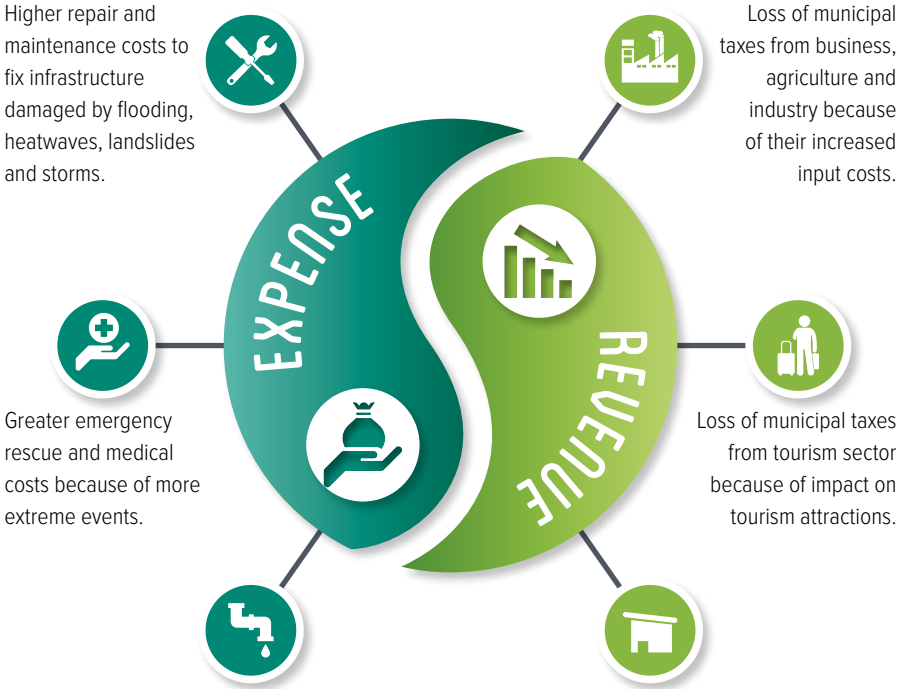
↓

compromised water quality

IMPACTS ON CITIES

The financial effects of climate change on municipal budgets are as devastating as the physical impacts. Climate change has a significant impact on the ability of local government to finance and deliver services: extreme weather conditions lead to unexpected expenditures and, subsequently, major disruptions in operations because of budget reallocation and prioritisation.

Cities need to make financial provision for retrofitting assets (e.g sewerage and drainage systems) to cope with new weather conditions.



Higher repair and maintenance costs to fix infrastructure damaged by flooding, heatwaves, landslides and storms.

Loss of municipal taxes from business, agriculture and industry because of their increased input costs.

Greater emergency rescue and medical costs because of more extreme events.

Loss of municipal taxes from tourism sector because of impact on tourism attractions.

Increased water supply and sewerage treatment costs, to ensure water quality and availability.

Loss of rates income because of decreased property values in affected areas (e.g. along coast)

WHAT CAN CITIES DO?

To mitigate the impact of climate change on their ability to deliver services effectively and sustainably, cities need to build resilience through a local and integrated approach. All city departments, local stakeholders and communities have to engage proactively to tackle the challenge of climate change.

Resilience is a process, one that needs to be planned for and acknowledged as a continuous system of learning. Cities must develop a climate change resilience system as a matter of urgency:

Resilience is "the capacity of a place to anticipate, respond and adapt successfully to challenging conditions such as global recession, environmental threats or pressures of population growth".[2] Others define resilience as "the capacity of an individual, community, or institution to dynamically and effectively respond to shifting climate impact circumstances while continuing to function at an acceptable level".[3]

PLANNING FOR CLIMATE CHANGE AND ITS IMPACTS STARTS WITH CITIES

INTEGRATE

Make climate change and sustainability central to city planning and service delivery, and include risk and vulnerability analysis.

EDUCATE

Form learning partnerships with other cities and local academic institutions, so that staff and communities understand climate change impacts.

EVALUATE

Identify and assess the climate change resilience measures throughout key supply chains.

BE INFORMED

Develop an interactive information system, to analyse and update weather/climate impacts on service delivery.

BE INCLUSIVE

Include stakeholders outside local government (other government spheres, private sector, civil society and communities) in planning for climate change mitigation and adaptation.

2. SACN (South African Cities Network). 2011. State of the Cities Report 2011: Towards resilient cities – a reflection on the first decade of a democratic and transformed local government in South Africa 2001–2011. Johannesburg: SACN.
3. ACCRN (Asian Cities Climate Change Resilience Network). 2009. Responding to the Urban Climate Challenge. Colorado, USA: ISET.

BUILDING RESILIENCE TO CLIMATE CHANGE

"There is no single solution for solving global climate change, but cities have the ability, capacity and will to lead."

(C40 Cities www.c40.org)

THE BUILDING BLOCKS OF A MUNICIPAL RESILIENCE SYSTEM

1 STAFF MEMBERS

- appropriate decision-making authority **[decision-making]**
- informed about what's happening **[situation awareness]**
- encouraged to be innovative and creative **[innovation]**
- empowered to use their skills to solve problems **[staff engagement]**
- access to expert opinions when needed **[leveraging knowledge]**

2 COMMUNITY

- informed about what's happening **[situation awareness]**
- encouraged to be innovative and creative **[innovation]**
- access to expert opinions when needed **[leveraging knowledge]**
- readiness to respond to early warning signals of change in its internal and external environment **[proactive bearing]**

3 THE ORGANISATION (CITY)

- sufficient internal resources for operating during business as usual and climate change crises **[internal resources]**
- developed and evaluated plans and strategies to manage vulnerabilities **[planning strategies]**
- readiness to respond to early warning signals of change in its internal and external environment **[proactive bearing]**
- strong leadership that provides good management and decision-making during crises **[leadership]**

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