



5TH SESSION: WORKING GROUP ON RISK-  
INFORMED URBAN DEVELOPMENT (WG-RIUD)  
- RISK APPRAISAL

STRATEGIC PLANNING BRANCH  
28 APRIL 2022

# RIUD SCOPING PHASE

## Guiding questions



**What is the problem and what are the threats stemming from the hazard ?**

- Durban as a coastal city is prone to coastal flooding & informal settlements flooding.
- The threats stemming from a hazard are damage to infrastructure, private & public properties as well as threats to human life as a result of flooding.
- Flooding is exacerbated by changes to the catchment, like hardening of surfaces & redirection of surface flows, & further compounded by blockages including plastic & biomass
- The no of house holds in Informal Settlement in 1:100 and number of settlements affected



**Which stakeholders think such hazard(s) are a problem? Mapping institutional organogram and interconnections.**

- Development Department Planning
- Human Settlement Department
- Coastal Stormwater & Catchment Management Department
- Disaster Management Department
- Climate Protection Branch
- Community & Residents of informal settlements
- Academia.



**Which legal institutions or governance structures are in place?**

*South Africa's Constitution*

The Climate Change Act soon to be signed into law

Policy- South Africa National Governments climate change adaptation strategy

Durban Climate Change Strategy.

South Africa's commitment to the Paris Agreement, including climate change adaptation actions.



**Why do you and stakeholders think this hazard is a cause for concern?**

- The hazards prove costly to infrastructure & personal investments & can claim human lives.
- There is already a record of loss of life & possessions,
- This is most concentrated in the poorest settlements where residents have the least means of coping.



**What are the available sources of funding, resources, and capacities?**

National Treasury

eThekweni municipal budget



# Durban Case Study : Quarry Road West informal settlement

**Focus :** role that mapping & urban datafication is playing in supporting social & environmental justice & transformation in an informal settlement.

Researchers from UKZN & ‘mapmakers’ from Quarry Road West informal settlement formed a 5 year partnership within Palmiet Catchment Rehabilitation Project (PCRP).

## Guiding questions



**What are the proposed actions that can mitigate the hazard?**

- Upskilling of community in hazard mapping
- look into the Transformative River Management Program for nature based solutions to mitigate the hazards
- Collaboration with other departments to relocate those living in risk areas.
- Informal settlements are addressed through a 2 phase intervention. (1) Scoping all informal settlements, (2) Seeing which ones are in flood prone areas to identify settlements at high risk then consider relocation.
- Working with Coastal Stormwater & Catchment management, Human Settlement Dept employing a graduated risk assessment for all informal settlements.



**Is there reliable data and enough time to prepare for the next hazard?**

- The availability of Data is a major capacity gap.
- Identification of different levels of vulnerability.
- Disaster Management Control-Early warning system is in place but there are data capacity gaps in communicating with communities at risk
- Next hazard could happen today but budget & resources not sufficient to prepare for the next hazard timeously.

**Intent :** co-construct a wide range of maps & data, to produce knowledge which supports social learning, the building of resilience & the upgrading of the settlement.



Located on a precarious & high risk site, the narrow floodplain of the Palmiet River, which is prone to flooding after storm events.



Transformative Riverine Management Programme in Quarry Road West Informal Settlement as part of Nature Based Solution:

- Climate change impacts are projected to include declining water quality (associated with risks to human health), more intense flooding, reduced water availability.
- The effects of changing climate in waterways can be disastrous if combined with blocked rivers & streams & settlements in vulnerable, flood-prone areas.
- These impacts can be seen within the Quarry Road West Informal settlement, already this settlement has experience 3 flooding incidents in the last 5 years (October 2017, April 2019 & recently April 2022).
- To address this issues, municipality has placed the protection of ecological infrastructure, especially river/stream system as a central pillar of its climate change adaptation response.
- The city is currently implementing the TRMP which will assist the city to cope with the increase in storms & heavy rains.
- The idea for the city is to ensure that ecological infrastructure is maintained to ensure its functionality & for the provision of ecosystem services.
- The pioneering Transformative Riverine Management Programme, led by a transversal municipal team, recognises the value of investing in riverine & catchment management & ecological restoration to reduce the load of alien & natural vegetation & solid waste moving down Durban's 4000 kilometres of rivers during heavy rainfall.
- The business case for this programme has shown the economic & social value of keeping bridges & culverts clear to reduce the risks of floods.
- This was abundantly evident when Quarry Road West informal settlement was overcome on 11 April 2022, when the river changed its course due to vegetation & solid waste blockages in bridges, adjacent to the settlement.
- Up until 11 April 2022, the Palmiet River had been open & free-flowing & was managing high river levels.







# Durban floods in April 2022 & the impacts on the QRW Informal Settlement

- The extreme nature of the floods that devastated Durban in April 2022 is compared to the worst floods that South Africa has experienced in the past 100 years.
- There is no precedent for the nature of the flood event that took place on Monday 11 April 2022. The floods & landslides that took place over 15 hours in our city brought a new focus to risk & vulnerability in Durban, due to their scale & intensity.
- The flooding caused the loss of 450 informal houses & resulted in significant erosional & infrastructural damage.

## Communication of flooding risk to communities

"climate science is thus clear that SA needs to invest in climate change adaptation & the uptake of early warnings by communities – flood-related risks will only be increasing."

### Early-warning system

- The community based early flood warning system in the Palmiet Catchment is a partnership between the Coastal Stormwater & Catchment Management Department, researchers from the SoBEDS at UKZN, & community leaders in Quarry Road West informal settlement, including a Green Corridor community-based officer & Enviro-champs.
- Coastal Stormwater & Catchment Management Department uses the FEWS system & radar to monitor storm cells in local catchments, providing real time data on storms & rainfall, & river levels in the Palmiet Catchment.
- Researchers from SoBEDS have developed local environmental governance networks, & they transfer flood risk warnings, rainfall & river level data from municipal officials to local community leaders through whatsapp groups, who then inform the broader community.
- On 10 April 2022, this information was being transferred across this network, with updates from all members of the network being communicated between each other until 3 am on Tuesday 12 April 2022.
- While this community based early flood warning system could not prevent the damage caused by the floods in Quarry Road West informal settlement, it significantly reduced the loss of life in the settlement.
- Flooding risk knowledge & warnings, were transferred through the local flood warning system, saving people's lives.
- The lessons learnt in the QRW Informal Settlement have been invaluable & provide opportunities for scaling up climate adaptation responses that make a difference.





# Risk appraisal

## Guiding questions



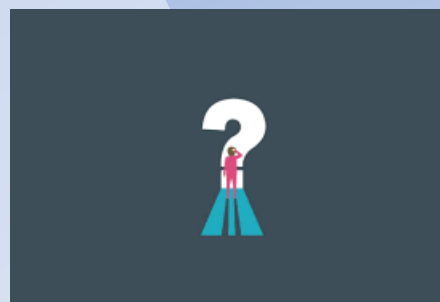
**Identification of all threats-Frequency**  
(How often will this threat occur),  
**Magnitude** (how big is this threat),  
**Impact** (How large are its effects)

- Floods,
- Fire risk
- The risk of 'initially invisible' landslides.



**Identification of exposures & vulnerabilities-Who will be affected & how will they be affected?**

- we require an optimised city-wide informal settlement approach with a two phase intervention:
- a) initial scoping of all informal settlements using 1:50 year flood-lines & existing contours to identify highest risk areas for further study
- b) graduated risk assessment on all highest risk informal settlements areas using the graduated tool to gauge where imminent relocations may be necessary & or where urgent mitigations or improved early warning communication systems would be beneficial



**Estimating complex risks, opportunities, & uncertainties**

- Durban is a nexus of increasing poverty & inequality, social, economic & environmental disruptions, increasing risk & vulnerability, like many other cities around the world.



**Among the multiple tools & methods, ranging from qualitative techniques to quantitative models for complex risk appraisal. With which have you worked with & or which elements have been already used in your jurisdiction**

- Forecast Early Warning System is key for hazard profiling
- Development of hazard maps with communities, capacity building & using these capacities to assist communities.
- Graduated risk assessment tool



**Develop initial monitoring and evaluation (M& E) system**

- The EOI for the Durban Case study precisely want answers to this question.
- Lessons to be derived from the FEWS & determine how can we implement it in other informal settlements across the city
- How can the weaknesses be addressed

# THANK YOU

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Partner von Connective Cities

mit ihrer

Im Auftrag des