**South African Municipal Risk Insurance: Parametric Flood Insurance Product Finalization for the City of Cape Town and exploration for products in two further municipalities**

## Presentation of AFD Group

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# Background

South Africa is uniquely positioned to scale the use of parametric insurance at the sub-national level. The country’s market penetration is high, the insurance sector is developed, the government’s appetite is strong, capacity is in place, and the governance structure allows for a staged approach, where more advanced municipalities lead the way and others join later, building an attractive national pool for underwriters.

Recent work conducted by the World Bank for the National Treasury (NT) highlights that municipalities only use insurance in limited cases, mainly for vehicles and buildings, and to a lesser extent for public infrastructure. Only 32% of South African municipalities use insurance at all, with median disaster payouts of just 4.9 million rand and slow settlement times of 12–24 months. Municipal insurance is generally inadequate, constrained by available budget, regulatory barriers to parametric products, and complex, lengthy claims processes. Guidelines on insurance procurement for SA municipalities are currently being developed and there is a piece of research on the ability of NT to provide a conditional grant to co-finance municipal insurance premiums in-lieu of payments from the National Disaster Fund post event.

Larger cities in South Africa (also known as metropolitan municipalities) show a strong appetite for innovative insurance approaches. For example, the City of Cape Town already operates their General Insurance Fund in which sector departments pay premiums into a city-wide fund for indemnity cover and is interested in exploring how parametric insurance could complement this, with quicker payouts and in order to protect the overall metro budget and implementation program, for example when extreme floods lead to an increased risk of short-term revenue reduction at the same time as increased emergency response needs. Pre-design technical work on a potential parametric insurance product was prepared for the City of Cape Town under a World Bank program, at the request of the National Treasury. This highlighted the significant potential of parametric products to complement existing insurance arrangements (more details below).

The vision is to scale up the level of financial protection in municipalities, starting with the more advanced municipalities, followed by others, and eventually scaling into nationwide products integrated into the disaster risk financing system at the national level.[[1]](#footnote-1) As well as financial protection, this work should support risk assessment practices and climate change strategies and action plans led by the municipalities that would serve to mitigate the disaster risks and impacts.

This TOR reflects two workstreams that are to be delivered by the consultant in a phased way. The first is to finalize the product design for a parametric flood insurance product for the City of Cape Town, building off the technical work done to date. Building on any successful parametric flood insurance product for the City of Cape Town, a second workstream would scope the potential for similar products for two other municipalities in South Africa (yet to be decided).

For Workstream 1, AFD Group (Agence Française de Développement) we will be partnering with the City of Cape Town and for Workstream 2 with the National Treasury and the selected municipalities. The World Bank will be a key partner across both workstreams as the output from this work will feed into a broader engagement of resilience. The contract with the Consultant will be funded by the AFD Group under the IDRIMA Facility and managed by Expertise France.

## Workstream 1

#### Background

An analysis of key climate risk drivers was conducted for the City of Cape Town (metropolitan municipality)[[2]](#footnote-2) through a literature review and interviews with key stakeholders. This found that heavy rainfall (particularly from “cut-off low” weather systems), rising sea levels, challenges with water management and the compounding effects of rapid informal development are all driving increasing flood risks. For example, the September 2023 floods cost Cape Town an estimated R154 million (NDMC, 2023). The City identified the need for protection for extreme flood events, to (i) protect the city’s revenue base, (ii) assist with recovery/repair of assets not covered by standard insurance; and (iii) support households and businesses in extreme events. Any payouts could be used for direct financial support to households/businesses, or as tariff / bad-debt relief, allowing people to recover while keeping the city’s balance sheet healthy and able to maintain the delivery of services against the planned budget.

Following further analysis of flood hazards, excess rainfall and high groundwater tables were identified as the most important drivers. Several possible parametric indices that capture these drivers were designed and tested against historical flood events in an initial parametric insurance design scoping project. An index based on excess rainfall (over 30 days) using one Cape Town weather station at the airport, which is representative of a broader area (10km), going back over 20 years, is in line with market standard and was thus selected as the most appropriate. Limited economic loss data available for two historic events (2023 and 2024) was used to create a loss curve. This proof of concept enabled two product options, with different trigger return periods, limits and payout functions, to be designed, and indicative premiums calculated for consideration by the City.

This analysis revealed that parametric insurance is most cost-effective for higher-return period (more extreme) events, to complement existing indemnity-based insurance, and to provide rapid financial support for the municipality in the event of severe rainfall events that cause significant disruption to industrial and residential areas (excluding the areas experiencing regular flooding), and subsequently to municipal budget income.

Further development work of the initial excess rainfall prototype is needed to extend the model to support the pricing and placing of a parametric flood insurance scheme that meets these requirements for Cape Town. In addition, such a model should inform broader disaster risk management decision priorities and feed into the City’s broader “Resilience Financing Framework” that covers the full risk management cycle. Such that if no disaster occurs, the analytics informing the product still support improved planning and adaptation decisions – which in turn reduce the impact of disasters. At the same time the index should remain simple to understand and explain, whilst capturing the severe flood events of interest.

With the delivery of this work, the City will be able to bring a product to market, at which point it should become a blueprint for the use of parametric products by South African metros. To capitalize on the momentum created by placing the product, and subject to the success of the first workstream, a second workstream (conditional tranche) will be undertaken to scale the parametric product to other municipalities beyond Cape Town.

#### Activities

The consultancy will be expected to perform the following activities. Any product design should meet the requirements of the insurance market for a parametric flood product (on risk modelling, validation and analytics).

***Phase I: Product design***

1. Lessons from existing parametric flood insurance products - Work with the City of Cape Town and other market experts to capture lessons from existing regional and global parametric products and implications/differences with their requirements for the new product.
2. Exposure data – working with the client and stakeholders, agree on the category(ies) of interest (e.g. population, businesses, transport links, public infrastructures, revenue streams etc…) and the geographic boundary of the area to be covered by the product for the City of Cape Town. Identify available data sets and the work required to access and reformat data to conform with the input requirements of the model. High quality exposure data for the urban environment will be particularly important in generating accurate assessments.
3. Regulation – work with the client (AFD Group), the City of Cape Town and the World Bank on any specific requirements related to regulation and requirements related to the product. Keeping in mind the need to have a flexible approach which can be adjusted over time.
4. Use of funds – Define the specific use of funds (e.g., emergency pumping, overtime for response crews, rates relief etc.), to comply with the requirements of many insurers regarding internal compliance approvals before quoting.
5. Historical flood impacts/losses – develop a set of scenarios of likely flood damage by area and asset type, using historical flood events for the defined area of interest in Cape Town. The scenarios shall specifically highlight the losses and impacts on the municipality’s assets and revenue streams – directly and indirectly (and not solely on affected households and businesses). This should be informed by data from the public, humanitarian and private sectors. Any historical data should be collated in a database for record and if the depth allows can be used to develop the historical loss distribution beyond scenarios. The scenarios can be used to define coverage and attachment points and retrospectively test them against these scenarios and actual history where available.
6. High resolution rainfall data – identify rainfall data with suitable spatial resolutions on which to credibly localize the rainfall within the area of interest. Enriching the one weather station-based excess rainfall structure with more weather stations to represent a broader area, given the distribution of industrial and residential areas across the municipality (excluding frequently flooding areas), considering the risks of using such data (such as access issues) and any other data sources is required to complement this.
7. Index design – Develop an index, with appropriate trigger thresholds to adequately proxy the vulnerability and corresponding losses in the areas of interest. For the selected exposure data set(s), analyze the options for developing additional vulnerability relationships.
8. Payout modalities – The Consultant should also define and test the payout modalities of the insurance mechanisms (binary on/off payouts or graduated payouts based on thresholds) The risk analytics and index developed for the product should be designed to also inform the City’s ongoing Flood Adaptation and Management Plan, with explanation provided on how they are to be interpreted.
9. Calculation Agent – Identify entities that could be in charge of the data download, control and validation of calculating index values during and following flood events and determining when trigger thresholds have been exceeded. This Agent must be selected based on criteria of reliability, independence, and transparency. Procedures must also be defined to address situations where the underlying index data are unavailable, as well as the potential cases and procedures for dispute and challenge.
10. Long-term vision and link to risk reduce investments – The Consultant will design a staged plan highlighting the connection between investments in risk reduction and level of insurance coverage required and how this can be adjusted over time (i.e., as risk is reduced, coverage can be adjusted to higher return periods).

Deliverable Phase I: Excel workbook presenting the selected index (i.e., rainfall parameters), historical data, and risk valuation, accompanied by a user-friendly presentation of the main contract findings for the City’s technical team. It is expected that this will be delivered to the City and National Treasury during an in-person workshop tentatively scheduled at the end of March / April 2026.

***Phase II: Product update and finalization***

1. Validation - the index should be validated by comparing the index to other flood related data, such as satellite imagery of flood footprints, but not necessarily use this to design the trigger as the desire is for initial simplicity.
2. Options for structure – provide the City of Cape Town with a simple tool (both a narrative and in excel or otherwise) to show the insurance parameter choices and the impact of changing these on potential pricing and payouts. These options will be presented to the City and wider stakeholders for feedback before finalizing. The presentation shall incorporate a section for high level (non-technical) City officials highlighting the policy implications of each option based on a cost benefit/analysis to inform their prioritization of the product they want to pursue. The options and final choices on the structuring will be discussed in a workshop (virtual or in person tbd). The structuring should also allow for a phased change in the product over time as more resources are invested in flood prevention and mitigation.

Deliverable Phase II: Excel document with final structure selected by the City alongside updated presentation of the work completed.

*After Phase II, the City will decide whether to move forward with the placement, and Phase III is contingent on this.*

***Phase III: Implementation phase***

1. Legal documentation – Prepare legal documents clarifying the insurance and reinsurance set up and wordings.
2. Placement – prepare an insurance marketing pack for the City to use to approach the market for placement (through a broker or otherwise).

Deliverable Phase III: Insurance package, with legal wording and necessary documents for submission to the regulator of the product approval package.

#### Out of scope

Whilst there is potential to base a flood monitoring system off earth observation (EO) data (for flood maps), initial feedback from the market suggests this is not priority, and the model based on excess rainfall should suffice. If the consultant thinks this would be a significant value add, they should alert the team for discussion.

In the longer-term, the development of a more sophisticated catastrophe risk model for the municipality could be supported, for example based on hydrological and hydraulic modeling, remote sensing data, and integrating exposure and vulnerability of different sectors. Such a model would enable detailed understanding of areas prone to riverine, surface water and coastal flooding, and their impacts on different sectors. Whilst this is currently not within the scope of this activity, it could in the future support risk management and climate change adaptation decisions, which could have additional benefits in improving insurance affordability (reducing premiums), as well as analyzing insurance requirements for residual risks, including design and placement of both parametric and indemnity products.

#### Data

* Output from the initial World Bank program, including engagements with National Treasury will be made available to the consultants.
* The City will share a list of the data they have available.
* In the Data Scoping stage, local engagement with stakeholders (e.g. national hydromet agencies)with facilitation provided to the consultancy by the City, the AFD Group and the World Bank.
* The consultant is expected to clarify any specific challenges around data availability, and ways in which data gaps can be closed. Depending on data availability the scope may need to be adjusted.
* All the data produced by the project and all outputs are to be shared with the client (AFD Group) as well as WB/City and other identified stakeholders (for internal use, not for public consumption).

## Workstream 2

#### Background

This workstream (conditional tranche) will commence upon the completion, or near completion, of the first workstream and will focus on assessing the replicability of the process conducted for the City of Cape Town across two other metropolitan municipalities. While all metropolitan cities will be considered for the analysis, the Consultant, supported by the Steering Committee, will, at an early stage, shortlist up to two metropolitan cities for deep analysis. This selection will be based on prior analysis conducted by the government and partners, supplemented by targeted desktop research. The type of insurance product and peril is not assumed ex-ante and should be explored in more detail under the first phase of activities of this workstream.

As the replicability assessment will depend in part on the outcomes of Workstream 1, the Project Steering Committee in collaboration with the Consultant will refine the precise activities outlined below at inception of this workstream.

#### Activities

*For all metropolitan municipalities (excluding Cape Town) complete the following:*

1. Analysis of key disaster risk drivers through a literature review and interviews with key stakeholders and provide a ranking to help each metropolitan municipality identify their priority risks for an insurance product (highlighting where parametric products could be suitable). The ranking should be based on the financial impacts of historical events across multiple hazards.
2. Identify data readily available for the design and operationalization of an insurance product for the most critical risks identified in 1
   1. Inventory and clean impact/cost datasets.
   2. Define loss/cost taxonomy for analysis.

*Following completion of Activity 1 and 2, up to two metropolitan municipalities will be selected for in-depth analysis.*

1. Conduct risk analytics and loss modelling to develop loss frequency/severity distributions and Exceedance Probability (EP) curves. Document assumptions and uncertainty.
2. Using the data from 2, design a selection (between 2 and 5) of possible structures that link to the top risk drivers identified in 1 and test against available historical data, calibrate triggers and thresholds, quantify basis risk and operational risks.
3. Provide a recommendation of the most appropriate structures considering data availability, results of testing and basis-risk, acceptability to international insurance markets, and other relevant factors.
4. Develop indicative pricing for consideration by the relevant municipal authorities.
5. Conduct value for money analysis on each option to inform prioritization by the relevant municipal authorities of the product structure they want to pursue. Compare baseline instruments vs strategies including any proposed cover and/or a data-triggered facility.
6. Provide an assessment of further work that would be needed in order to bring a product to market, including data and risk modelling, with indicative costs and timelines.

#### Indicative Deliverables (for each municipality) under Workstream 2

* Database of historical disaster events and their financial impacts, with rankings.
* Documentation of all data sources used, and provision of any public data used in the development of the potential solutions.
* Excel spreadsheets e.g.
  + any potential parametric indices, risk profiles, and results of testing against historical events
  + the developed potential product options
  + the VfM analysis, and documentation of key assumptions
* Presentation slides of the high-level methodology and key findings from each of the listed activities, and recommendations.

#### Data

All available and existing data analysis for other municipalities will be shared with the Consultant via the Client. The consultant will be expected to engage the steering committee and other technical leads to access further data.

## Proposed Timeline

Workstream 1 is expected to start immediately. Workstream 2 will begin at the completion of Workstream 1, with the specific timelines for activities confirmed at inception.

| **2026** | **February** | **March** | **April** | **May** | **June** | **July** | **August to December** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Workstream 1** |  |  |  |  |  |  |  |
| **Phase I** | **X** | **X[[3]](#footnote-3)** |  |  |  |  |  |
| **Phase II** |  |  | **X** | **X** |  |  |  |
| **Phase III** |  |  |  |  | **X** | **X** |  |
| **Workstream 2** |  |  |  |  |  | **X** | **X** |

## Ways of working

The deliverables under this contract will be reviewed by a steering committee and accepted by AFD Group/Expertise France. The steering committee will consist of the relevant government staff (national and municipal), the AFD Group contracting & technical teams, and the World Bank technical team (a key partner for this engagement). The committee membership may evolve over the contract.

The Consultant will be expected to travel for key in-person validation workshops with national and municipal government staff and partners. There will be a minimum of two such workshops over the contract. Where possible virtual meetings will be conducted to limit unnecessary travel.

## Selection criteria

* Experience in the assessment and modelling of floods and their impacts.
* Existing flood risk models in other countries that have been used for the design of parametric and other risk transfer structures for a variety of trigger options.
* Preferably experience with existing models and analytics for the target country and cities.
* Demonstrated track record and knowledge of developing risk models for the insurance industry in the region.
* Demonstrated track record and knowledge of designing insurance structures that have been accepted by the insurance industry to underwrite business.
* Demonstrate track record and skills in advising and supporting cities/local authorities in decision making in terms of risk insurance.
* A local presence / partner to work closely with the municipality’s team would be a plus.

1. The South African Disaster Response Financing Strategy puts insurance at the core of South Africa’s approach to resilience, placing special focus on the use of insurance at the municipal level to reduce reliance on the national government. <https://www.treasury.gov.za/comm_media/press/2025/Annexure%20A%20Disaster%20Response%20Financing%20Strategy%20v8.pdf> [↑](#footnote-ref-1)
2. Referred to as the City or Cape Town herein. [↑](#footnote-ref-2)
3. Tentative in person workshop planned end of March 2026 [↑](#footnote-ref-3)