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‘Why numbers matter’

– Towards a data-driven approach to flood risk management in Lagos

This factsheet provides a tabular ‘at a glance’ summary of the key data required to unlock and maximise identified opportunities for enhanced management and transfer of flood risk in Lagos, Nigeria.

For background context on the multi-dimensional flood risk profile facing Lagos, the past history of flood events in the city, and the traditional barriers to uptake of flood risk management and transfer insurance products in Nigeria, please see the first briefing in this two-part series, ‘Managing the water ‘megacity’ – Flood risk and resilience in Lagos’.

Please note that the following table includes an assessment of the current status of key data required for developing products at the micro and macro level (including conducting risk assessments). Although more detailed landscaping and planning will be required, this high-level status check is intended as an initial ‘call to action’ for the multi-stakeholder effort needed to deepen the maturity of Nigeria’s nascent flood risk insurance sector.

Data	Function	Flooding type	Current status
Flood risk maps (res between 30m - 90m) with return periods from 1:2 to 1:1000 & climate change scenarios)	**Hazard data -** Used to promote a culture of flood risk awareness amongst users, thus creating demand for FRPs. This FRP is a minimum requirement for users to understand the extent and magnitude of the hazard.	Unclear - these maps have not been accessed.	C40 and UNDP have developed a flood risk map for City of Lagos; however, this map is not currently available to users; JBA and FATHOM may also possess risk maps.
Spatial data on the location of the user’s underlying assets	**Exposure data** - Needed to understand the exposure of the asset(s) to flood risk/impacts. This data is a minimum requirement for users to conduct risk assessments.	Pluvial, fluvial and coastal.	Unclear whether users have this data in the correct format at present. If not, the geolocations of assets can be found through technical assistance.
High resolution topographical (digital elevation models LIDAR) data (2 – 5m) (urban) or lower resolution (30 m) (rural)	**Hazard data**- Required to model water flows in hydrodynamic and hydraulic models. This is a minimum requirement for modelling water flows.	Pluvial (high resolution) and fluvial (low resolution), however the quantity of data needed may change for fluvial. Only topography data may be needed for areas along the river channel.	LIDAR (2 – 5 m res) available from GIS section of Lagos state office of Lands and Survey, but cost and current proprietary nature of the data limits sharing to third parties.
In-situ rainfall data (measured rainfall)	**Hazard data** - Rainfall is a key input into flood model that determines the magnitude of flooding events at different thresholds. Also needed for validation if remote sensed rainfall products are used. This is a minimum requirement for modelling and validation.	Pluvial, fluvial and coastal	NIMET and NIHSA have this data (commercially available but incomplete), as does JBA Risk Management. However, this data is commercial and not distributable to third parties. Weather stations may also be installed in areas with no coverage. Weather station costs are between USD 1000 – USD 5000.

Data	Function	Flooding type	Current status
Flood depth	**Hazard** - Flood depth is a possible trigger for parametric insurance. Not essential if a strong correlation between rainfall and flooding events is detected.	Fluvial and pluvial	Currently, sensors need to be installed. For flood depth outputs from the modelling to be linked with payouts (model validation), on the ground measurements of flood depth via flood sensors are needed. Code4Africa and FloodFlash have experience in this and can assist.
Hydro-meteorological data (river gauge data)	**Hazard data** - The river channel characteristics are used to calculate the stage (height) with rainfall inputs used to calculate water overflow from the channel. Minimum requirement – essential to model fluvial flooding. Non-essential for pluvial or coastal flooding.	Fluvial	Managed by the Hydrological Services Agency (HSA) but currently missing - several stations were damaged by flooding events. The user would need to work with the HSA to acquire river-gauge data. Gridded rainfall datasets that are higher in resolution such as CHIRPS, APHRODITE or ERAInterim can also be used (JBA, 2021).
Cadastral maps (property boundaries)	**Hazard/ exposure data** – provides an indication of property boundaries, which may influence water flow dynamics within flood models. Non-essential for commercial users.	Pluvial and fluvial (but the area coverage of the cadastral map may be less for fluvial flooding as property boundaries may only be required for areas adjacent to the river channel.	There is no up-to-date digital database system for land administration in Nigeria. This data can be created using drone technology or from digitized maps which are georeferenced. A GIS/ remote sensing mapping company could undertake these studies (e.g. Southern Mapping / Code 4 Africa).
Land use and land cover data	**Vulnerability data** – show water flow and infiltration during flooding events and can help users understand how assets differ in terms of vulnerability. Minimum to understand vulnerability and for modelling.	Key dataset for fluvial and pluvial flooding. The resolution and level of detail of land use and land cover data will be determined by the area of interest (urban or rural).	These are publicly available (AFDB Open Data platform) but may not be fit-for-purpose. If not, will require partnership with a GIS/spatial analysis firm (e.g, Southern Mapping), as they can create land use and cover datasets using satellite imagery and classifications.

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