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resilience brokers

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resilience brokers

Introduction to Resilience Brokers and the Trust

- UK group to speed up and scale up transformative urban/rural development;
- Operates in space between private, public, knowledge and civil society sectors;
- Leading experts foster **integrated-systems thinking** and **collaborative approaches**;
- Develop tools and demonstrators to support implementation of 2030 agenda in city regions;
- Open source, free-to-use tools - "**resilience.io**" integrated-systems modelling platform
- Data-driven, social and natural science based.

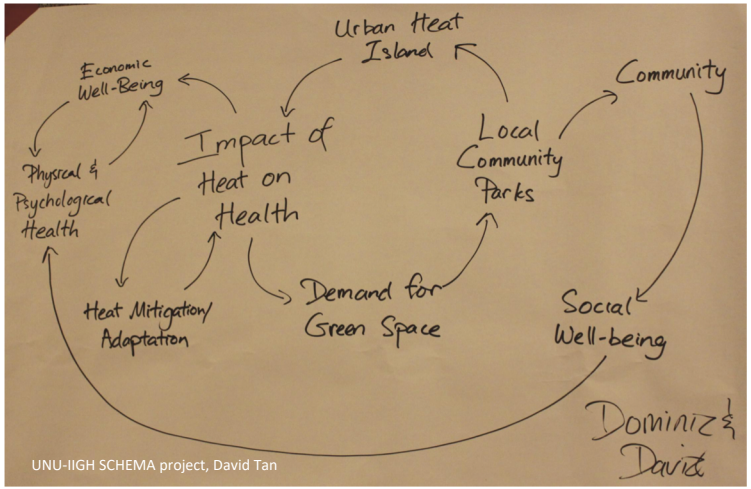

ecological sequestration trust

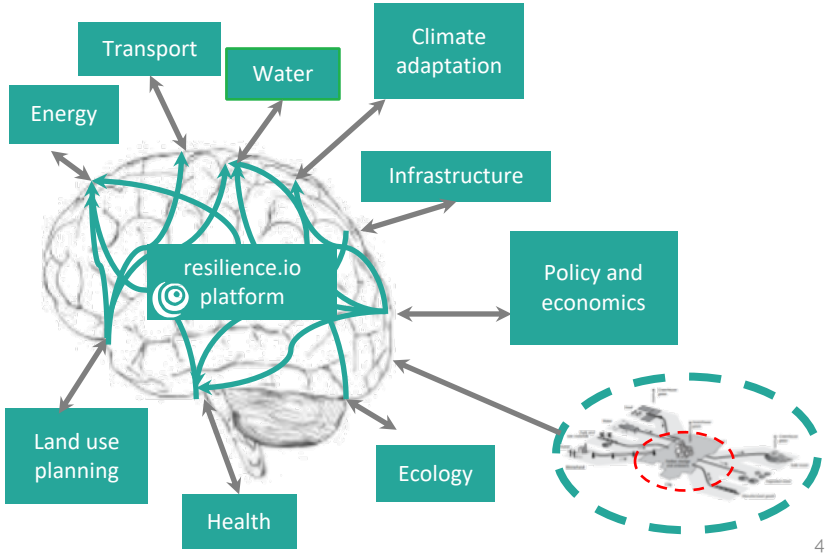
resilience.io

Approach - Systems thinking and collaborative intelligence

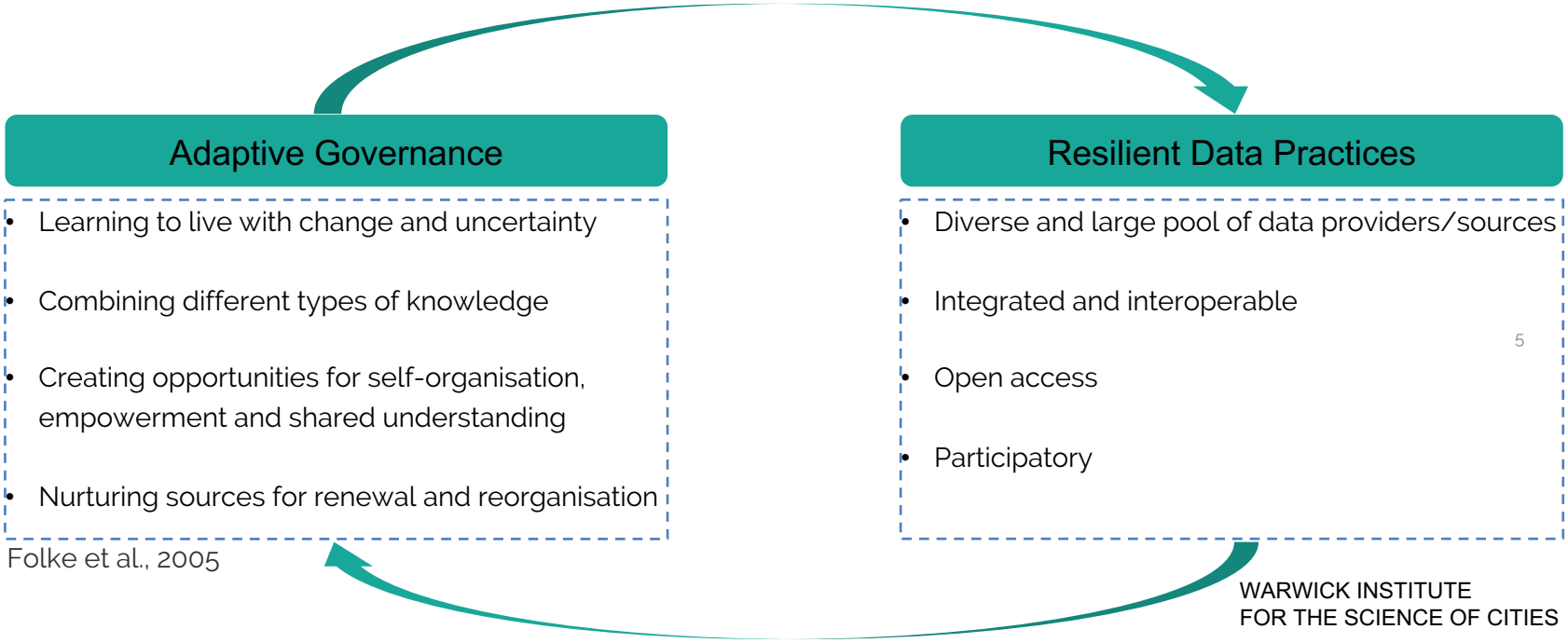
*By using **systems thinking** and **collaborative intelligence** together with integrated planning, **transformational change** is within reach of communities and governments.*

Example: human health and wellbeing, urban heat island effect:





Approach - Adaptive governance



Folke et al., 2005

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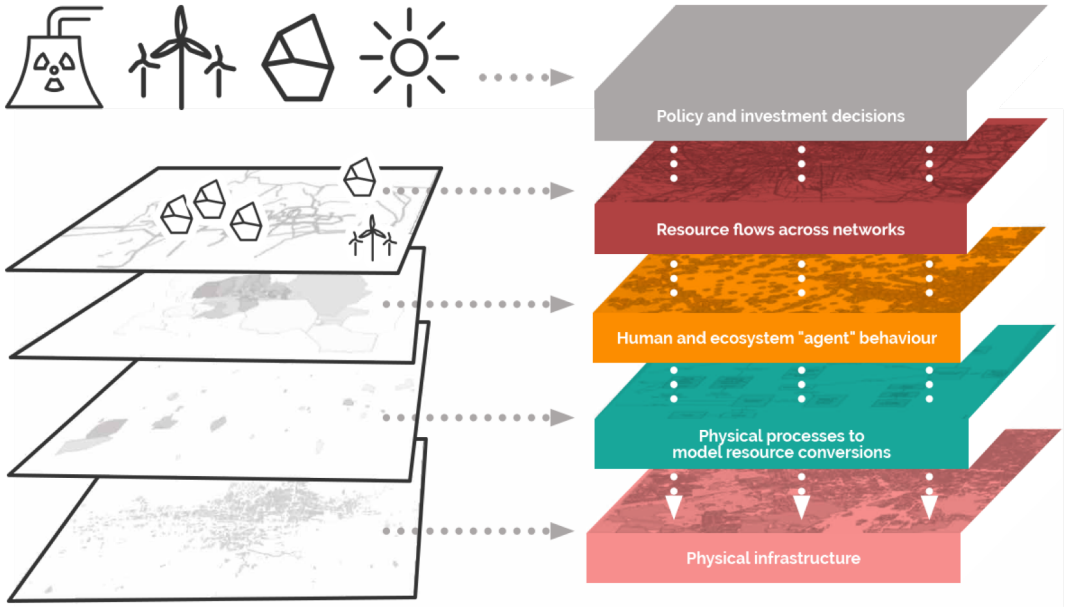
An integrated-systems modelling platform that combines a suite of interlinking modules, including:

*An **agent-based model (ABM)*** simulates the population of the entire city-region, their choices, consumption patterns and behaviours.

A growing library of input-output ***process blocks*** *(resource conversions)* ***for process optimisation*** that describe all of the energy and materials flows of a city-region system. These processes are geo-located to build up an integrated systems network based on the actual functions of a city or other geography.



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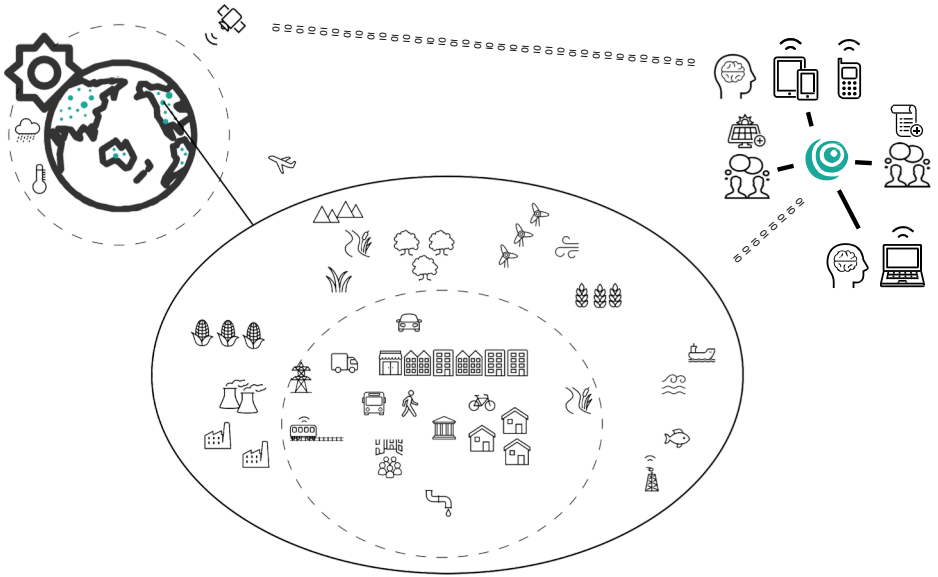
Data brokering approach

Geo-locate flows, infrastructure

Data-brokering infrastructure enables access to and interoperability with a wide variety of data sources:

- geo-locational data and from Earth observation;
- open datasets across scales (e.g., local, regional);
- proprietary data sets;
- ground-based sensors;
- Open data
- crowdsourced data.



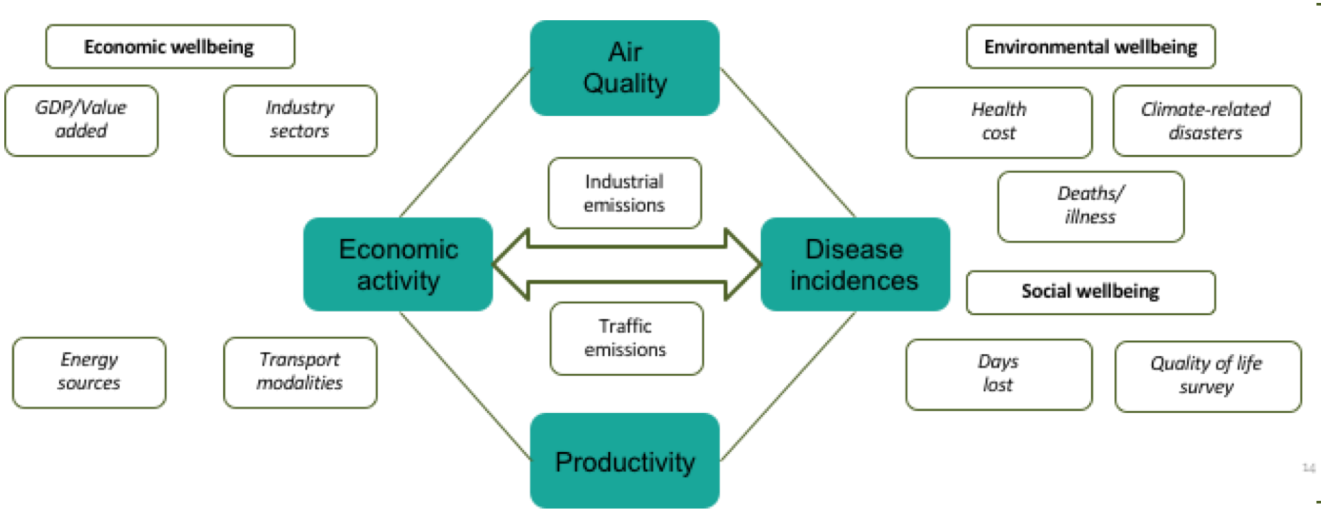
GEO GROUP ON EARTH OBSERVATIONS

ISU CODATA

Pilot project - resilient cities - Medellín

Research question and data sets

- a systems focus on air quality has been agreed, extending existing initiatives in Medellin
- **Research question:** how can the interdependencies between air quality, economic activity and human and environmental well-being be described with an Agent-Based-Model for collaborative scenario-building?



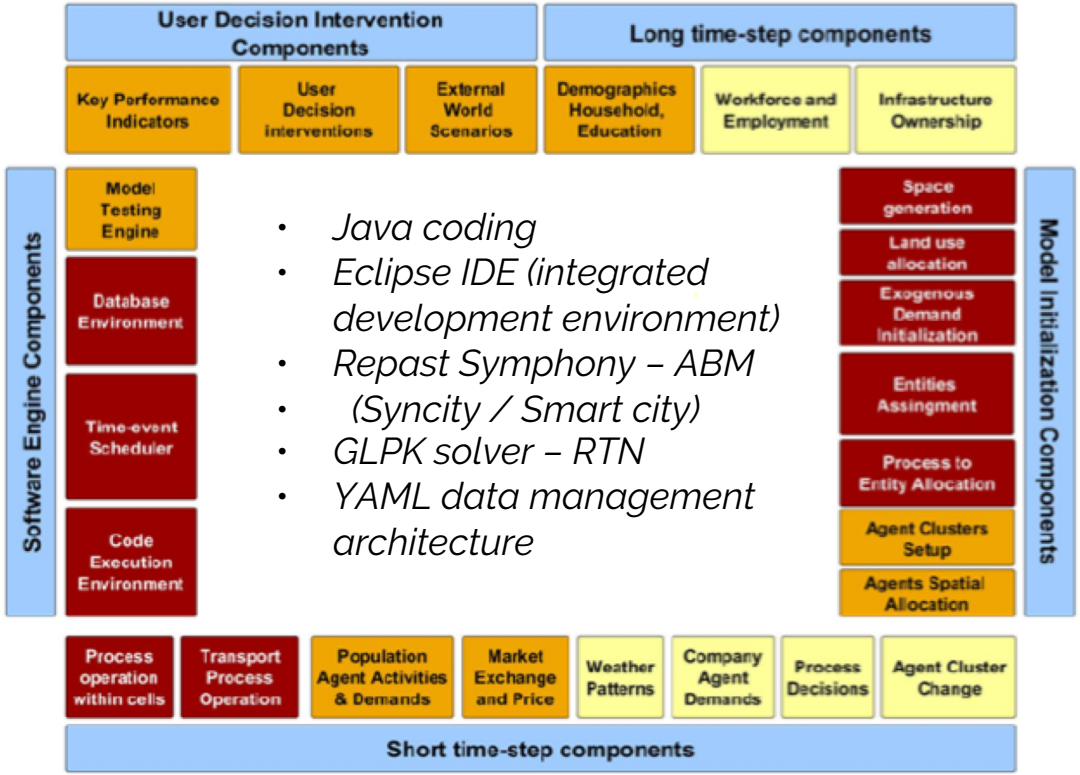
Workshop Questions (link)

Inventory (link)

WARWICK INSTITUTE
FOR THE SCIENCE OF CITIES

resilience.io prototype built

- 25 computer modules
- 50/200 Digital Twins
- full set of specifications
- Application testing on 3 use cases



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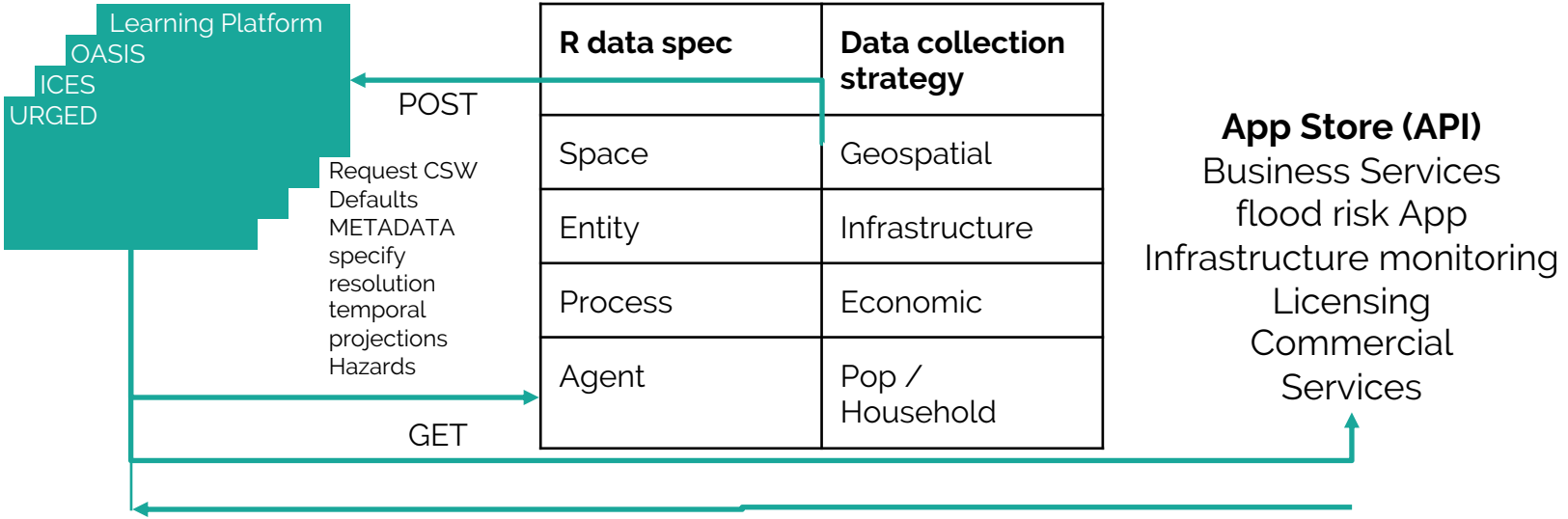

Step 1.
(Predicted / exists) Baseline
DESCRIBE
Initialisation / setup (module)
Boundary definition
Request data from e.g. URGED, ESA, COPERNICUS, GEODAN, ICES, OASIS to populate local instance
Data collection exercise - CENSUS, CROWD, OPEN, SECTOR (Collaboratory)
Data collection strategy
5 step verification
Harmonisation
Data gaps
Enhance / update data sets

Step 2.
(Imagined / collaboratively)
USE
(user cockpits)
Build scenarios - (Technologies, policies)
Updating data sets
Processes entities
Testing scenarios
Model runs
Results
Evidence / Recommendations / Insight

Step 3.
ACT
Implementation
Investment Policy (Bankable projects) UDIF RIIF
Change

Update baseline model
Validation

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Data Specification

Dataset	Boundary	Population	Households	Employment	Education	Activities	Income/ expenditure	Economic activity	Sector - Process Network Infrastructure
Spatial area									
Period									
Ref.									

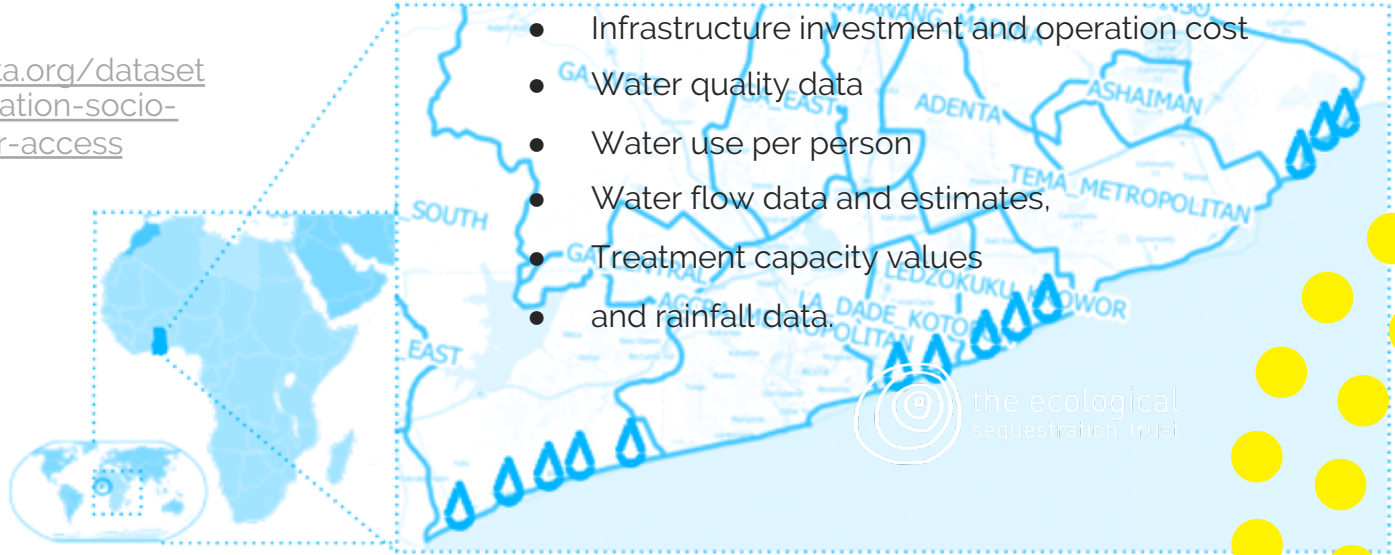
Data type	Source	Data type	Source
Population data per Local Government Area	Australian Bureau for Statistics	Agricultural waste generation	MRA's report to Hunter Water
Water supply and demand	Hunter Water water consumption data	Waste technology data	Hunter Water and literature
Recycle water supply	Hunter Water effluent reuse data	Water and wastewater technology data	Hunter Water data
Wastewater generation and treatment	Hunter Water forward capital program data	Electricity generation technology data	Energy Market Operator and literature
Electricity supply and demand	Australian Energy Market Operator	Existing water / wastewater network	Hunter Water network figure
Gas supply and demand	Jemena	Existing electricity network	Energy Market Operator
Municipal solid waste	WARR Survey	Water for Central Coast	Central Coast Council

Open access data

- Population socio-economics
- Water access
- Tariffs
- Water and sanitation infrastructure in place
- Infrastructure investment and operation cost
- Water quality data
- Water use per person
- Water flow data and estimates,
- Treatment capacity values
- and rainfall data.

DESOLENATOR

The direct link is:
https://africaopendata.org/dataset/greater-accra-population-socio-economics-and-water-access



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