

# *A CHEER Platform for Realizing Agenda 2030* *'Collaborative-Human-Ecological-Economics-Resources'*

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#Geo4SDGs

#GWF 2019

## *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 and tools for **integrated-systems** and **collaborative approach**. **Resilience.io**  
In 2018 set up the Resilience Brokers Programme:
- Support financeable performance based PPP projects
- 40% reduction in infrastructure cost to deliver Agenda 2030
- Multi-hazard risk analysis
- Marketplace for solutions to support resilience

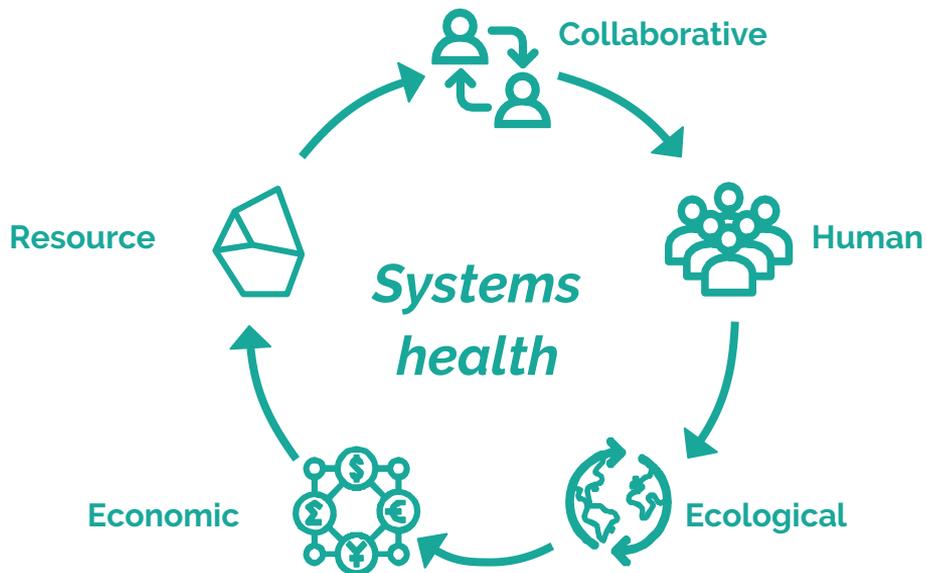


## The CHEER systems-health approach

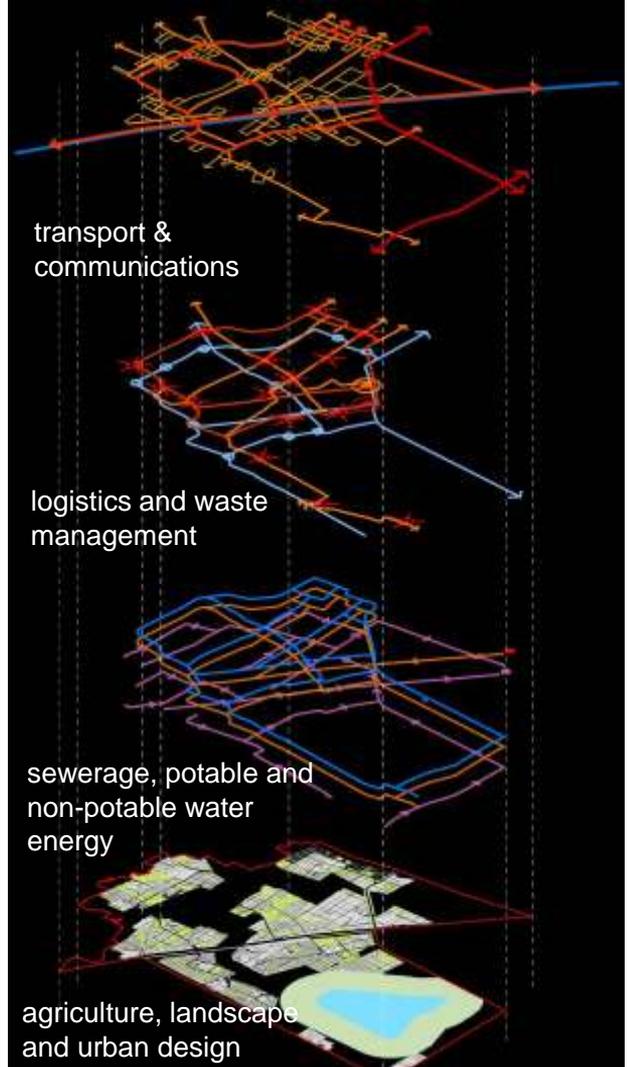
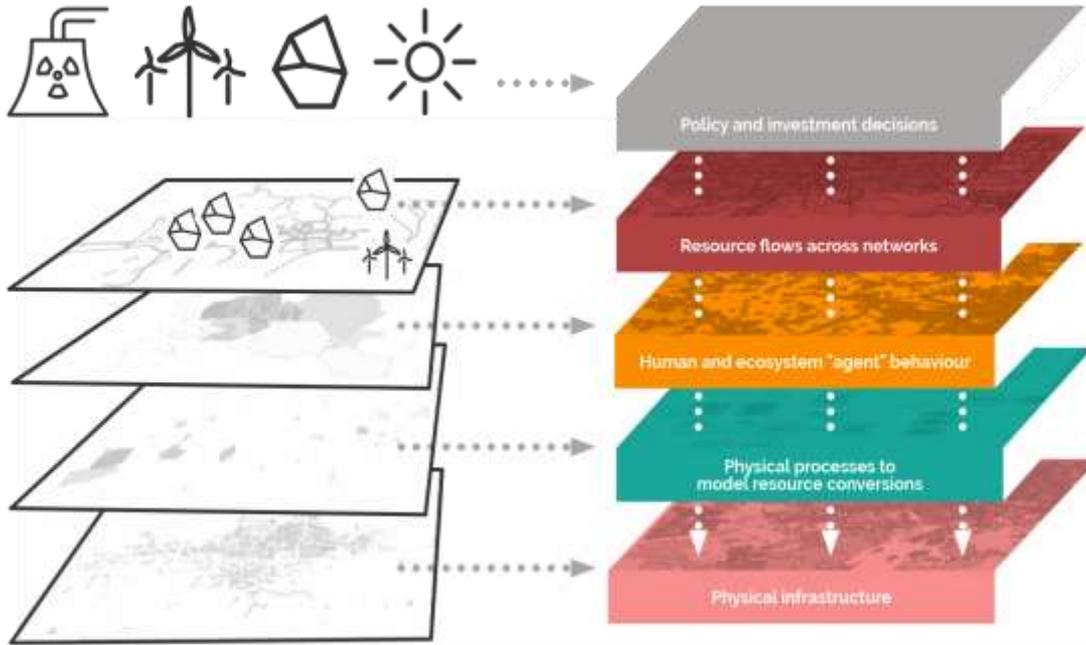
An approach that harnesses big data and scientific evidence to support local decision making by integrated modelling of:

- Social and natural systems and their interlinkages,
- Economics related to human wellbeing,
- The health of ecological systems.

The CHEER approach supports scalable solutions and the global deployment of leading technologies and innovative business models.



# Integrated Infrastructures



# Data brokering approach - a change in paradigm

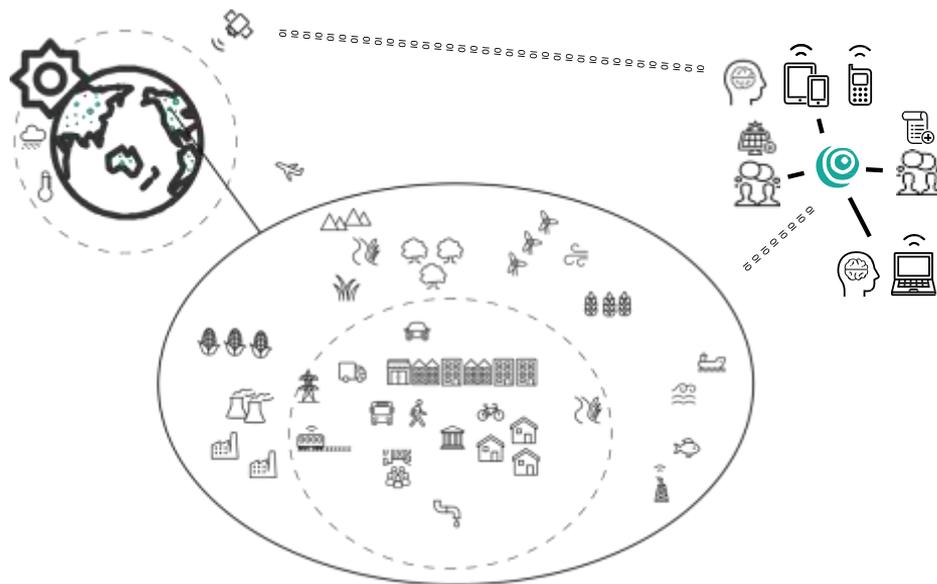
## Interoperability through mediation

System of systems integration, linking complex and heterogeneous systems by building bridges between existing network platforms and systems infrastructures.

## Geo-locate flows, infrastructure

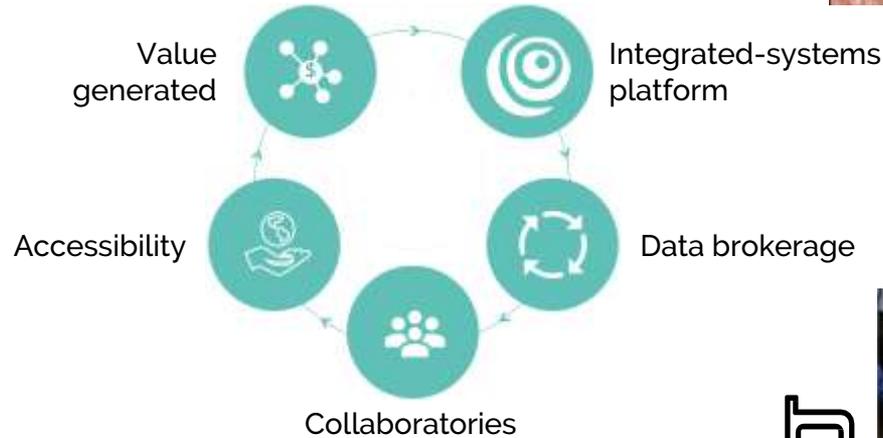
Data-brokering infrastructure enables access to and interoperability with a wide variety of data sources:

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



# Fostering collective intelligence

## Co-creating a data brokerage system



## Data Brokerage System



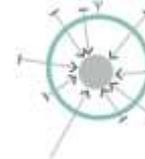
4. User interfaces



3. Systems-modelling services



2. Data cataloguing and processing



1. Data access

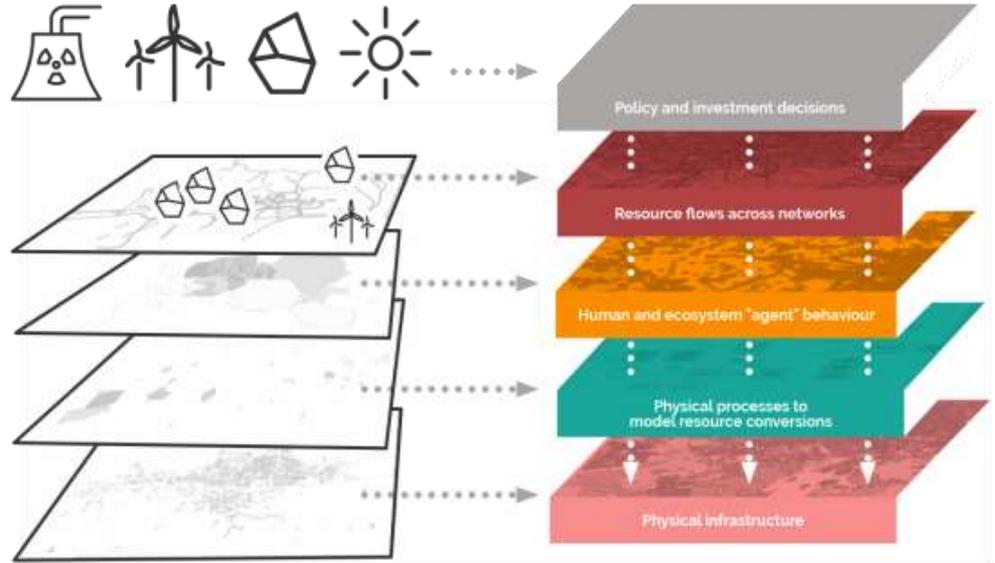


# Social Science

An **Agent Based Model** (ABM) simulates the population of the entire city region, their choices, consumption patterns and behaviours.

# Natural Science

A growing library of input-output **Digital Twins** (process optimization blocks) that describe all of the energy and materials flows of a city-region system and their business models. These processes are geolocated to build up an integrated systems network based on actual city function.



# Decisions

## Investment in infrastructure

- Energy, Water, Transport, Housing, ...
- Local, foreign, government, private, ...

## Market Policies and planning

- Taxation, tariffs, quota, subsidies, ...
- Land use plans, regulations, ...

# Indicator outcome range

## (5-20 years)

- Sector resource and energy flows
- Effects on imports & exports
- Wastes & Emissions (CO<sub>2</sub>, CH<sub>4</sub>,...)
- Employment, income, in(equality)
- Human wellbeing indicators
- Ecological health indicators
- Sector economic activity
- Access to service / %



# Supporting city regions to tackle practical problems



## resilience.io platform use cases

<b>Greater Accra, Ghana</b>	<i>Water supply, sanitation and accessibility</i>	
<b>Hunter Valley, Australia</b>	<i>Water infrastructure, energy transition, institutional resilience</i>	
<b>Union Canal, Scotland, UK</b>	<i>Water supply, sanitation and accessibility</i>	
<b>Anninghe, Sichuan, China</b>	<i>Integrated multi-hazard modelling</i>	
<b>Queen Elizabeth Olympic Park, London, UK</b>	<i>Digital and social inclusion, green space accessibility</i>	
<b>Medellín, Colombia</b>	<i>Air quality, public health, transport, green space</i>	

## emerging Resilience Brokers projects

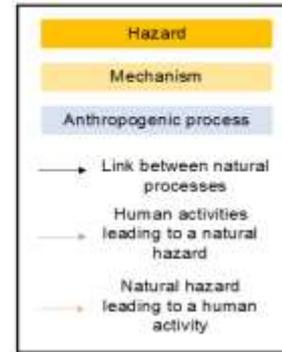
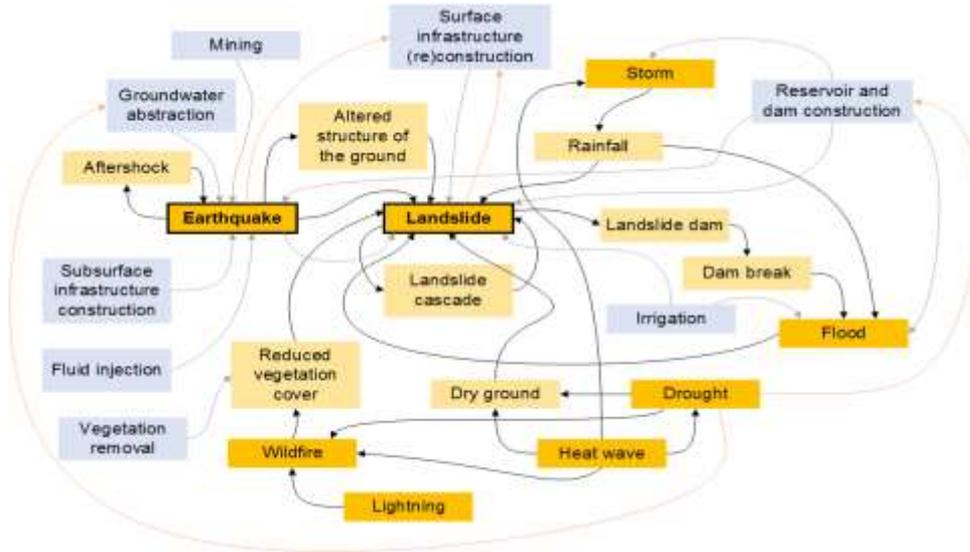
<b>Beirut, Lebanon</b>	<i>Green space, urban health, pedestrian and cycling routes</i>	
<b>Western Cape, South Africa</b>	<i>Water supply, energy transition</i>	
<b>Amsterdam Metropolitan Area, Netherlands</b>	<i>Integrated smart mobility and housing; regional data cooperation</i>	

# *Multi-Hazards* **Dujiangyan, Sichuan Province**

Resilient Economy and Society  
by Integrated SysTems modelling  
(‘RESIST’)



# Multi-Hazards



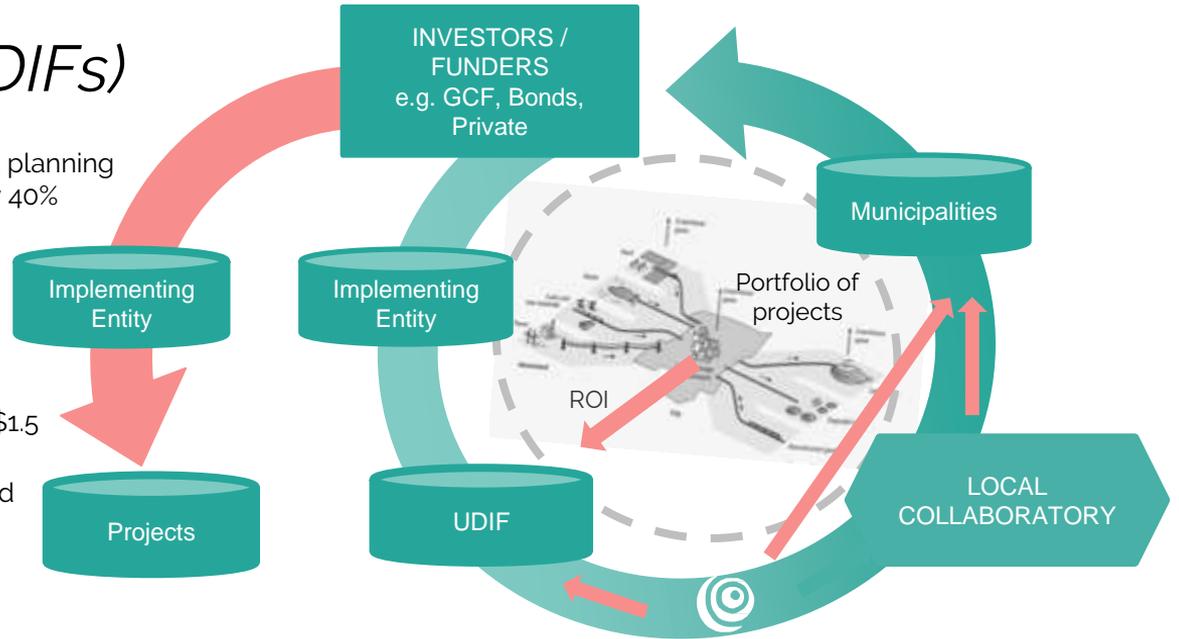
# Urban Development Investment Funds (UDIFs)

Smart selection of projects and improved design, planning and maintenance can reduce finance demand by 40%

Sustainable infrastructure cost through integrated planning is \$3 trillion/yr (2014 prices): this is 4.8% of GDP

Current private sector spend on infrastructure is \$1.5 trillion/yr.  
\$1 trillion/yr could come from Bonds into blended UDIF.

43% energy  
29% transport  
21% water, flood and waste  
7% communications/data



# Networked organisation

Drawing strength from a global network of delivery and knowledge partners

