

CLUVA

Climate Change and Urban Vulnerability in Africa

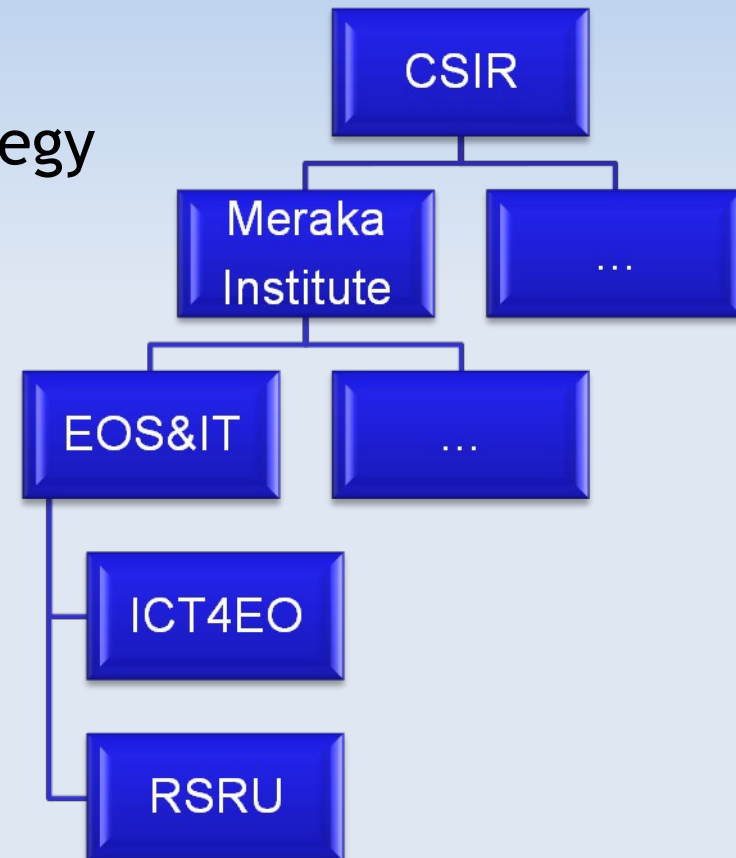
Theme [ENV.2010.2.1.5-1]

Assessing vulnerability of urban systems, populations and goods in relation to climate change induced disasters in Africa

About us

ICT for Earth Observation

- Mandated by SA Science, Space & EO strategy
 - DST Grand Challenges: Global change,
 - Space Science, SAEOS,...
- South African EO investment...
 - SANSA and SumbandilaSAT, SAEON, ACCESS,...
- ... and in ICT infrastructure:
 - CHPC, SANRen, Seacom



How can we improve return on these investments for societal benefit?

Objectives

- Develop methods and knowledge to manage climate risks, reduce vulnerabilities and improve resilience to climate change
- Improve capacity of scientific institutions, local councils and civil society to cope with climate change.
- Assess environmental, social and economic impacts of climate change induced hazards likely to affect urban areas, with the overall aim to develop innovative strategies in support of policies for climate change

Partners - Africa

13 in total



Gaston Berger University, Sénégal



University of Ouagadougou,
Burkina Faso



University of Yaoundé, Cameroon



Ardhi University, Tanzania



Addis Ababa University, Ethiopia



Council for Scientific and Industrial
Research, South Africa

Partners - EC



AMRA, Italy - Coordinator



University of Copenhagen, Denmark



University of Manchester, UK



Technical University of Munich, Germany



Helmholtz Centre for Environmental Research



Euro-Mediterranean Centre for Climate Change Research



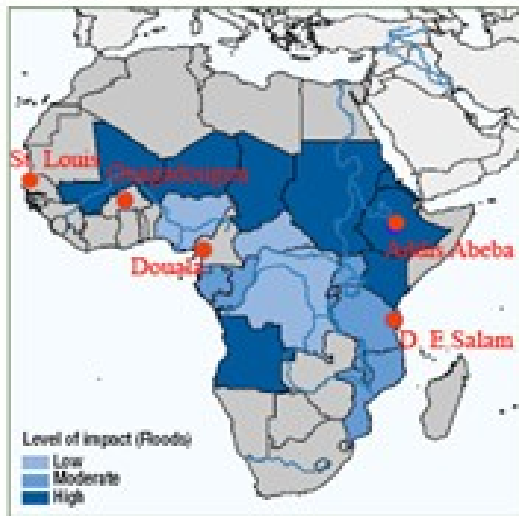
Norwegian Institute for Urban and Regional Research

Research to inform policy

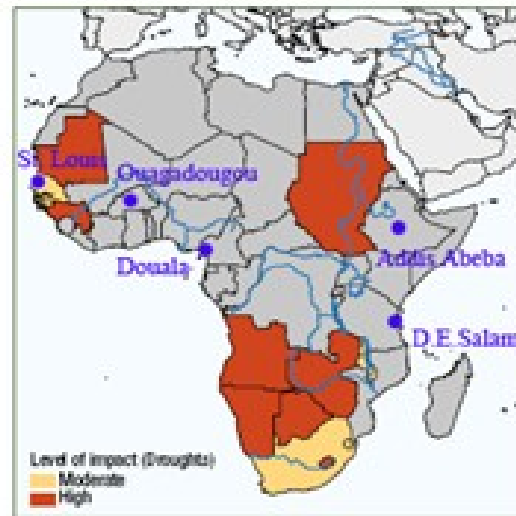
- CC adaptation methods and strategies to improve of resilience and coping capacity of urban centres in Africa
- Local case studies conducted in close cooperation with policy makers at city and regional level
- Promote evidence based urban planning & policy making
- Improve capacity of scientific institutions, local councils and civil society
- Hazards as a cascade of climate changes: Environmental, social, economic impacts likely to affect urban centres
- Floods, sea level rise, storm surges, droughts, heat waves, desertification, fires

Scenarios

Floods



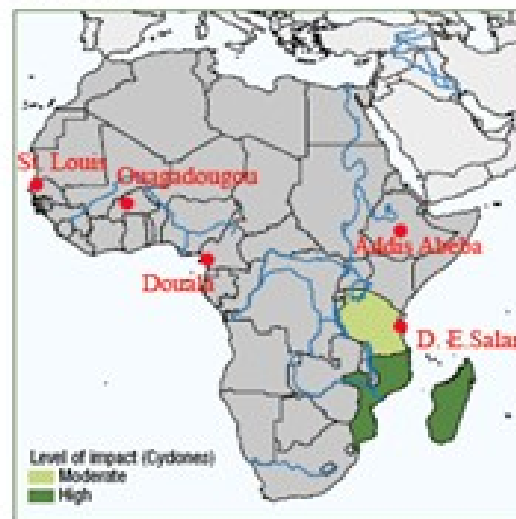
Droughts



Sea level rise



Cyclones



Saint Louis



Ouagadougou



Douala



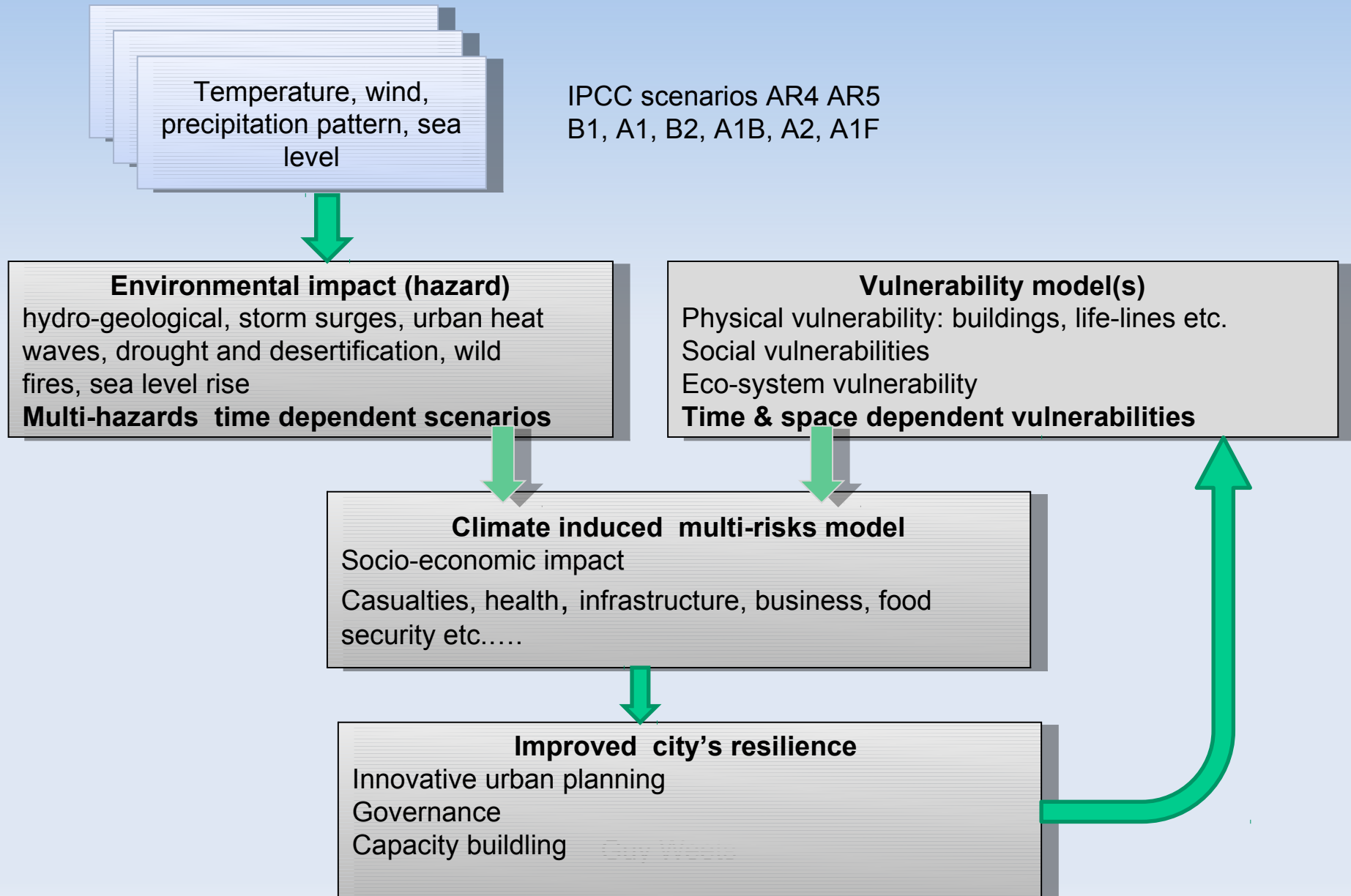
Dar es Salaam



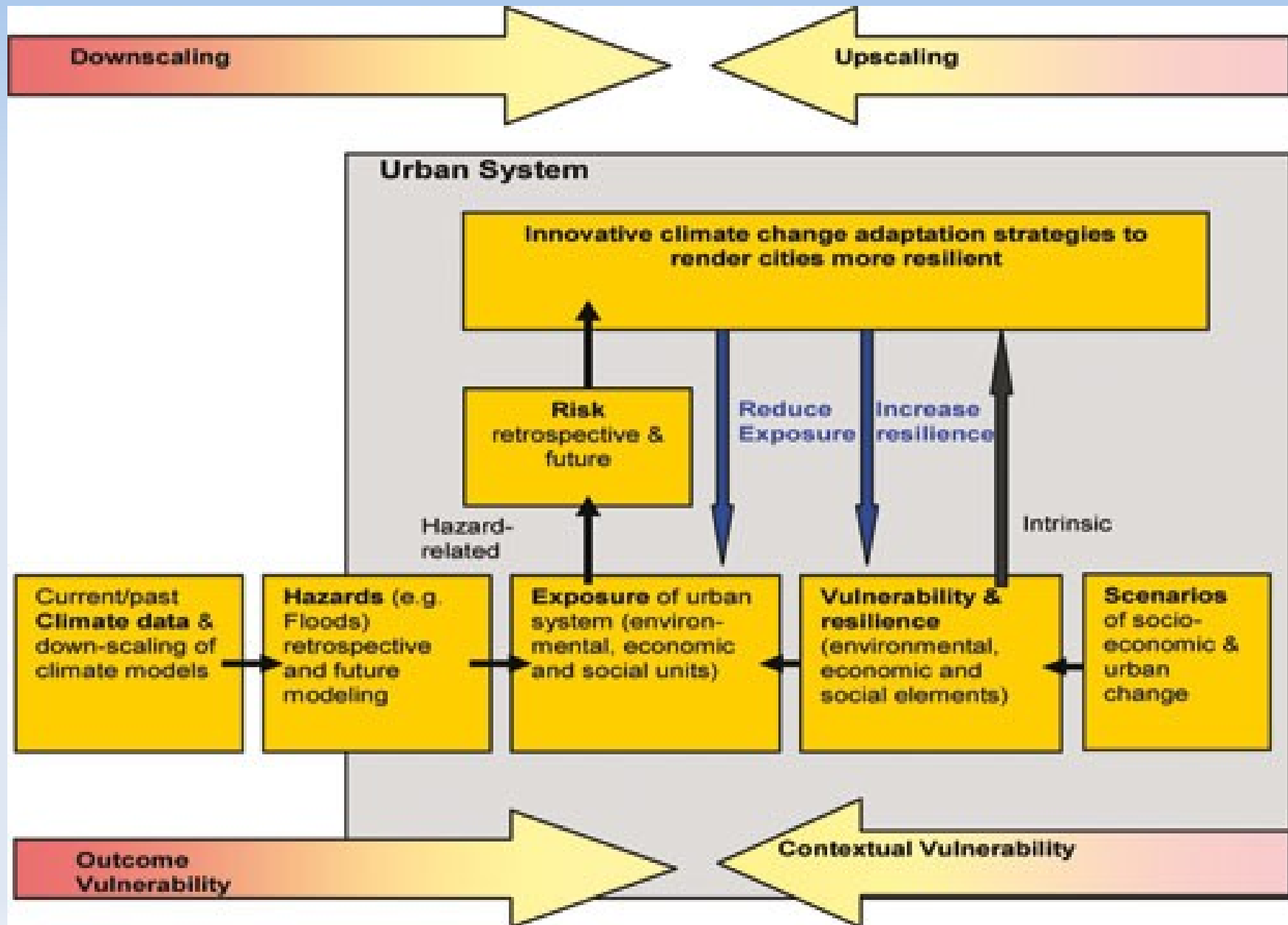
Addis Abeba



Concept



What we have in mind



Method

- Generate downscaled climate models per city:
 - Input: IPCC + regional data, finer resolution
 - Output: Temperature, precipitation, wind patterns,...
- Develop environmental impact models
 - Input: Climate model
 - Output: Hazard maps for heat waves, drought, flood, fire, locust plagues, desertification, etc.
- Evaluate urban risks and vulnerabilities
 - Input: Hazard variations
 - Output: Risk models induced by CC

Climate induced risks

Primary climate factors

- Temperature (Local warming)
- Rainfall
- Wind
- Sea level rise

Induced risks

Flood

Storm surge

Extreme heat waves

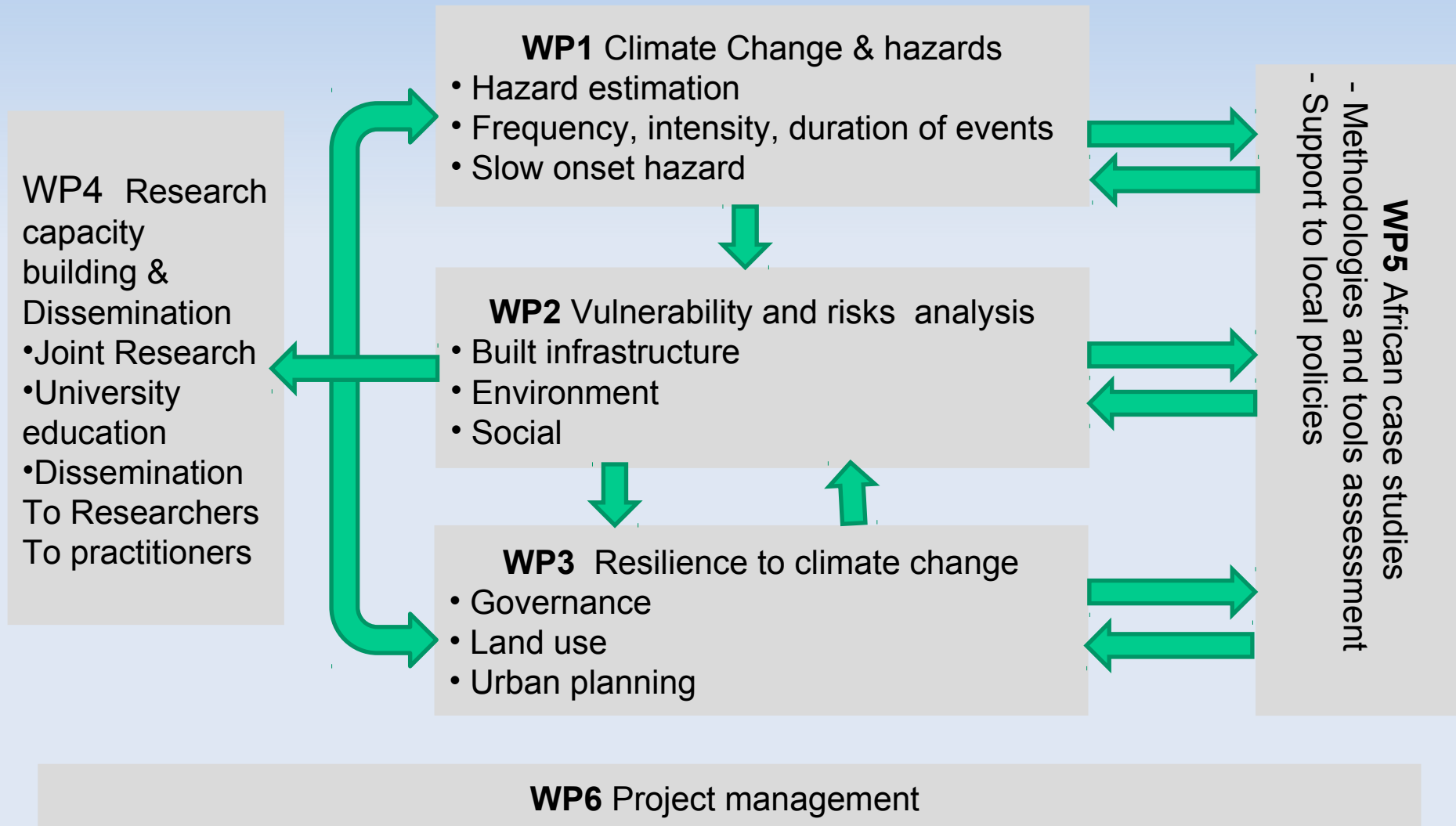
Drought

Desertification

Coastal erosion

Poverty and health

Project structure



Major results

- *Up-to-date sub-regional climate projections and web services to access data and indices
- Methodology and tools for assessing vulnerabilities of African cities (WP2)
- Risk assessment and climate risk mitigation models (WP3)
- *Improved African R&D capacity: M, D & post-D research (WP4)
- Improved links between universities and policy decision making (WP5)

CSIR main contributions

Meraka-ICT4EO & NRE-Atmospheric modelling

- WP1- CSIR leads the following tasks:
 - Regionally (50km) downscaled CC projections from ensemble of IPCC models for Africa
 - Locally (8km) downscaled projections for selected cities
 - Open standards Web services for data sets co-hosted at CHPC's VLDB, and for dynamic maps
- WP4- CSIR leads this Work Package:
 - Develop African expertise in CC and related fields in collaboration with partners, UN-Habitat and UN University: Coordinate post-grad & post-D research

Benefits

- CC data sets for Africa, useful beyond CLUVA
- Leverage SA HPC computing infrastructure
- Relationships = networks: We do better R&D together
 - Who you know
 - Who knows you
- Greater awareness of local challenges
 - African vulnerability
 - African capacity
 - Agricultural and environmental sustainability
- Funding is not the main motivation (but helps)



Sensor Web Enabled



SCIKITS.TIMESERIES
PYTHON TIME SERIES ANALYSIS

Multi Process

Multi Threaded

Cloud Computing



pysal
Python Spatial Analysis Library



EO4vistrails



<http://code.google.com/p/eo4vistrails/>

Thank you

<http://www.cluva.eu>

CLUVA

CLimate change and Urban Vulnerability in Africa

SEVENTH FRAMEWORK PROGRAMME
Environment (including climate change)
Call: FP7-ENV-2010

THEME [ENV.2010.2.1.5-1]

[Assessing vulnerability of urban systems, populations and goods in relation to natural and man-made disasters in Africa]



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