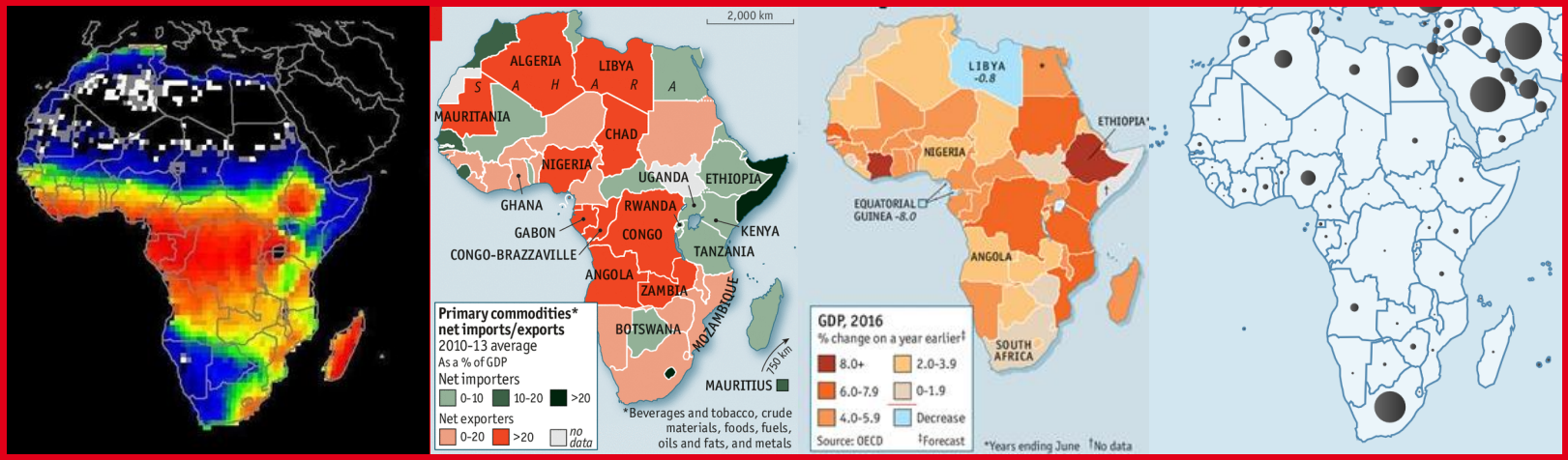
SEACRIFOG

Supporting EU-African Cooperation on Research Infrastructures

for Food Security and Greenhouse Gas Observations

Introduction to the project

Dr. Emmanuel SALMON, ICOS (Finland)



Sunyani, June 16, 2017

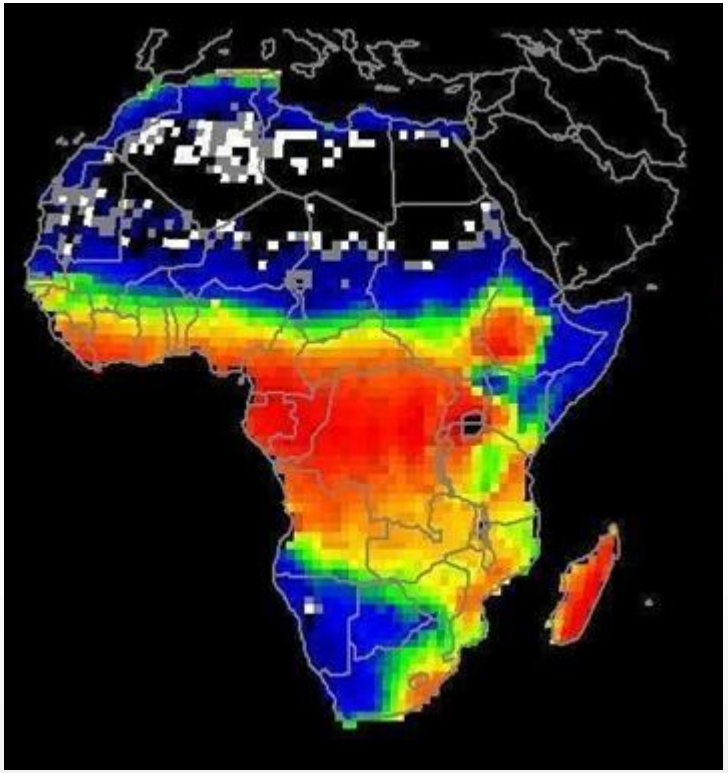
Introduction and background
A continent of fast change

changing population

changing patterns
of human settlements

land-use change

land
management
change



changing patterns of use of
ecosystem services

climate variability
and climate change

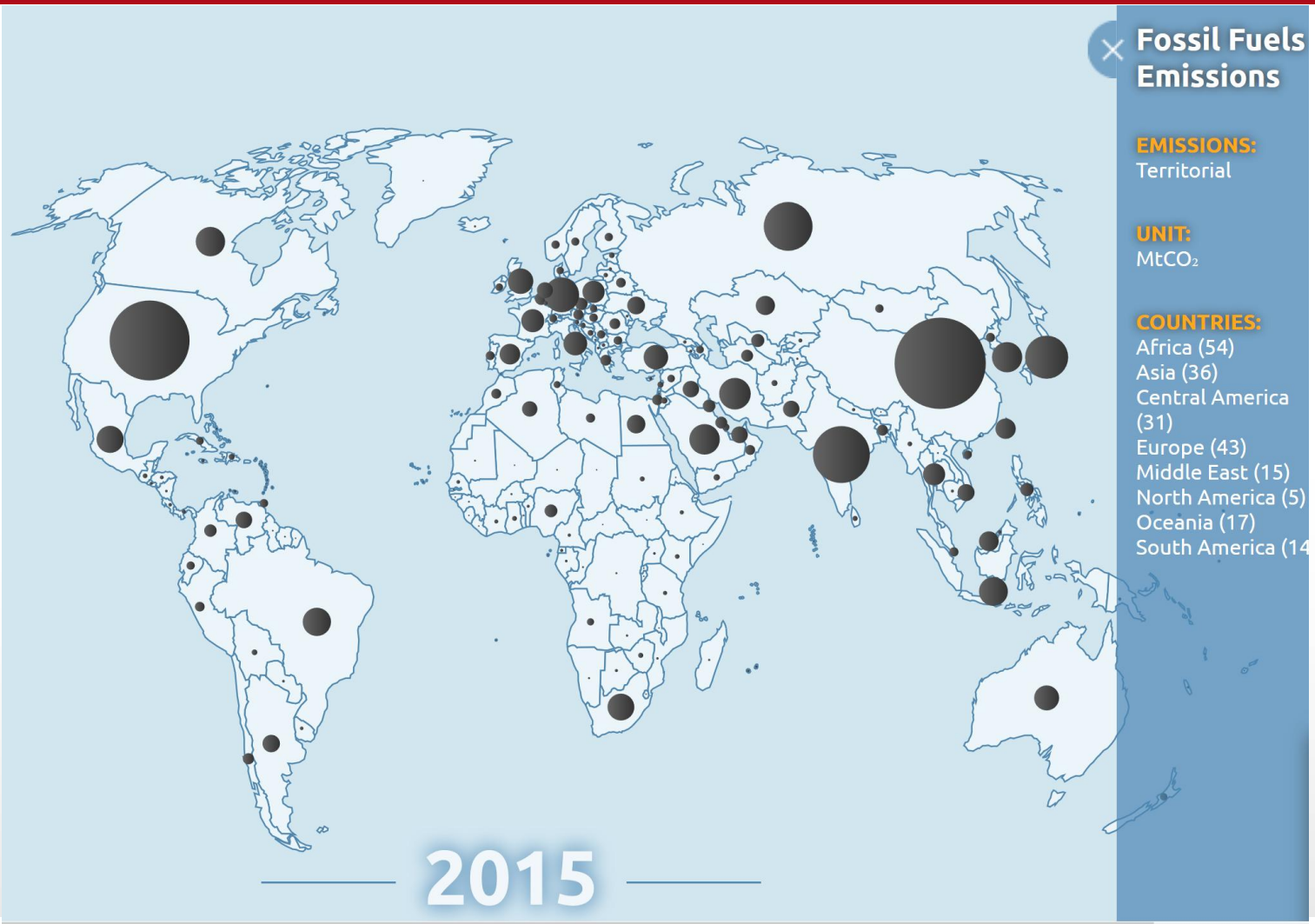
…

Introduction and background
Economy

[1] Includes countries with 2008 GDP ≥$10 billion or real GDP growth rate of ≥7% from 2000-08; excludes 22 countries, which accounted for 3% of African GDP in 2008.

Source: Organisation for Economic Co-operation and Development (OECD); World Bank World Development Indicators; McKinsey Global Institute analysis

Introduction and background
Fossil fuels emissions



Introduction and background
Population development

Africa Population History

Year	Population	Density (km²)	Growth Rate	World %
2017	1,246,504,865	42,043	2.4399%	17.81%
2015	1,186,178,282	40,008	2.4937%	16.95%
2010	1,044,106,862	35,216	2.5618%	14.92%
2005	920,238,945	31,038	2.4971%	13.15%
2000	814,063,149	27,456	2.4302%	11.63%
1995	720,416,386	24,299	2.4958%	10.29%
1990	631,614,304	21,303	2.6999%	9.02%
1985	550,027,726	18,552	2.7993%	7.86%
1980	477,965,128	16,120	2.8024%	6.83%
1975	416,490,405	14,048	2.7014%	5.95%
1970	365,625,902	12,332	2.5672%	5.22%
1965	321,999,241	10,860	2.5125%	4.6%
1960	284,887,148	9,609	2.3993%	4.07%
1955	253,963,199	8,566	2.2227%	3.63%
1950	228,901,723	7,721	1.9673%	3.27%

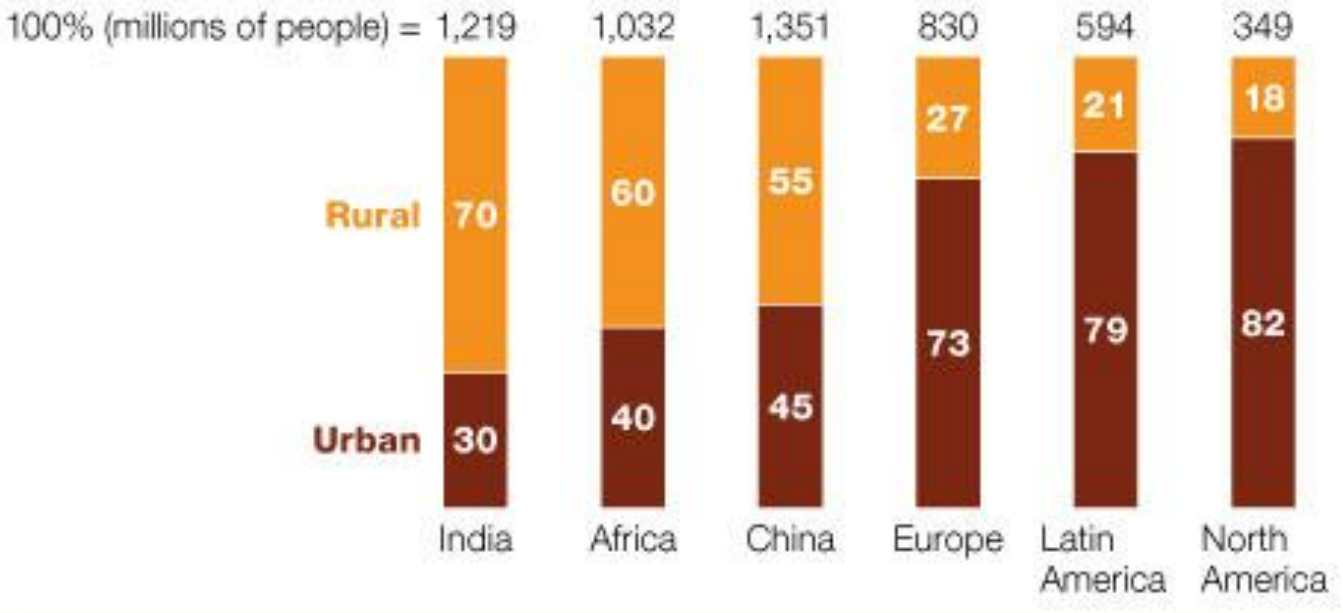
Introduction and background
Population development

Africa Population Projections

Year	Population	Density (km²)	Growth Rate	World %
2020	1,340,103,338	45,200	2.3605%	19.14%
2025	1,504,213,342	50,735	2.2426%	21.49%
2030	1,679,301,149	56,640	2.1451%	23.99%
2035	1,865,921,620	62,935	2.0502%	26.66%
2040	2,063,029,911	69,583	1.9413%	29.47%
2045	2,267,855,869	76,491	1.8189%	32.4%
2050	2,477,536,324	83,564	1.6934%	35.39%
2055	2,689,772,979	90,722	1.5702%	38.43%
2060	2,902,500,356	97,897	1.4515%	41.46%
2065	3,113,840,880	105,025	1.3382%	44.48%
2070	3,321,968,377	112,045	1.228%	47.46%
2075	3,524,627,535	118,881	1.1191%	50.35%
2080	3,719,491,948	125,452	1.0123%	53.14%
2085	3,904,528,067	131,694	0.9106%	55.78%
2090	4,078,374,265	137,558	0.8122%	58.26%
2095	4,239,337,969	142,987	0.7186%	60.56%

Introduction and background
Population development

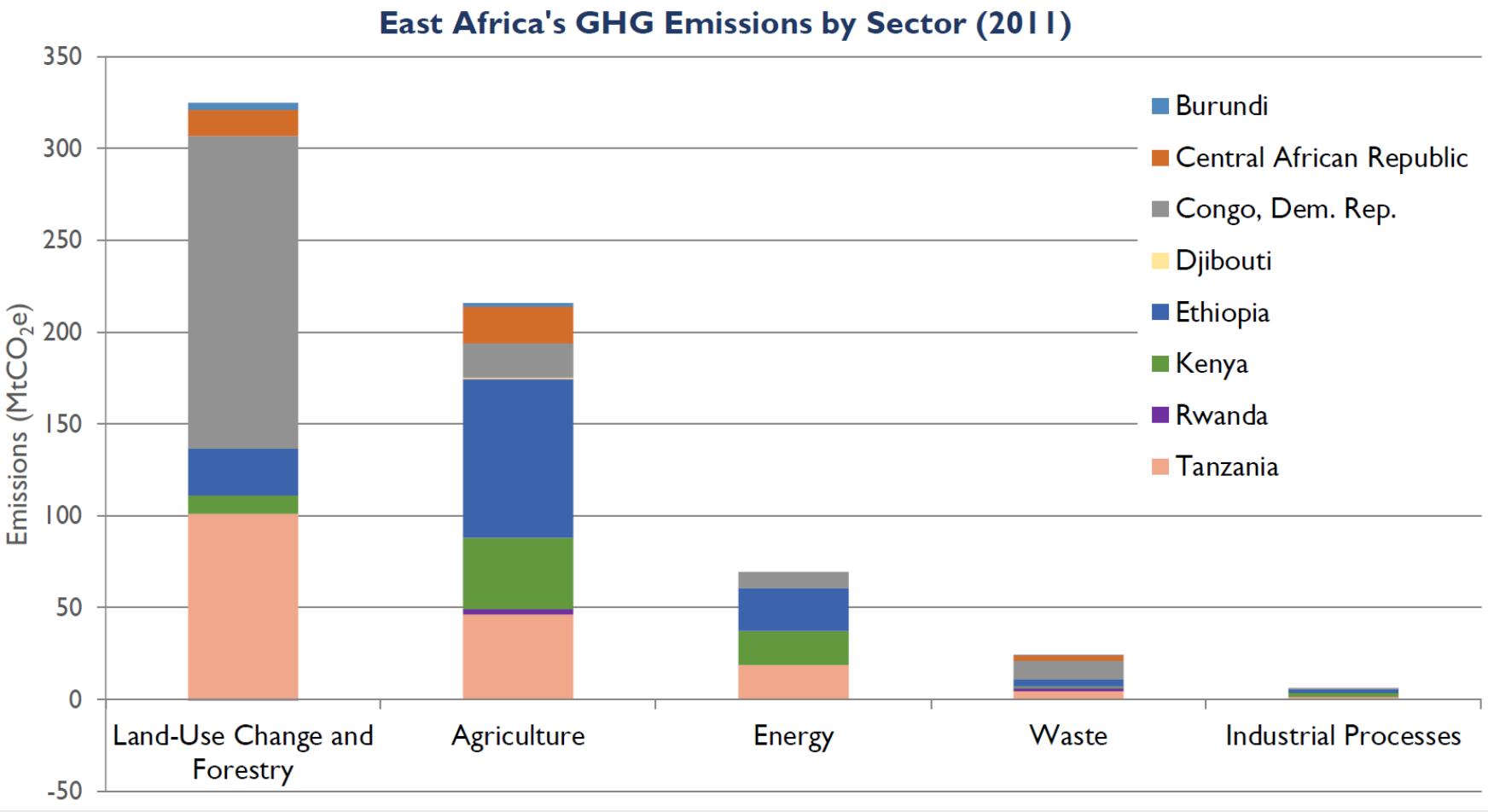
Share of population by region, 2010, %



	India	Africa	China	Europe	Latin America	North America
Number of cities with ≥1 million people	48	52	109	52	63	48

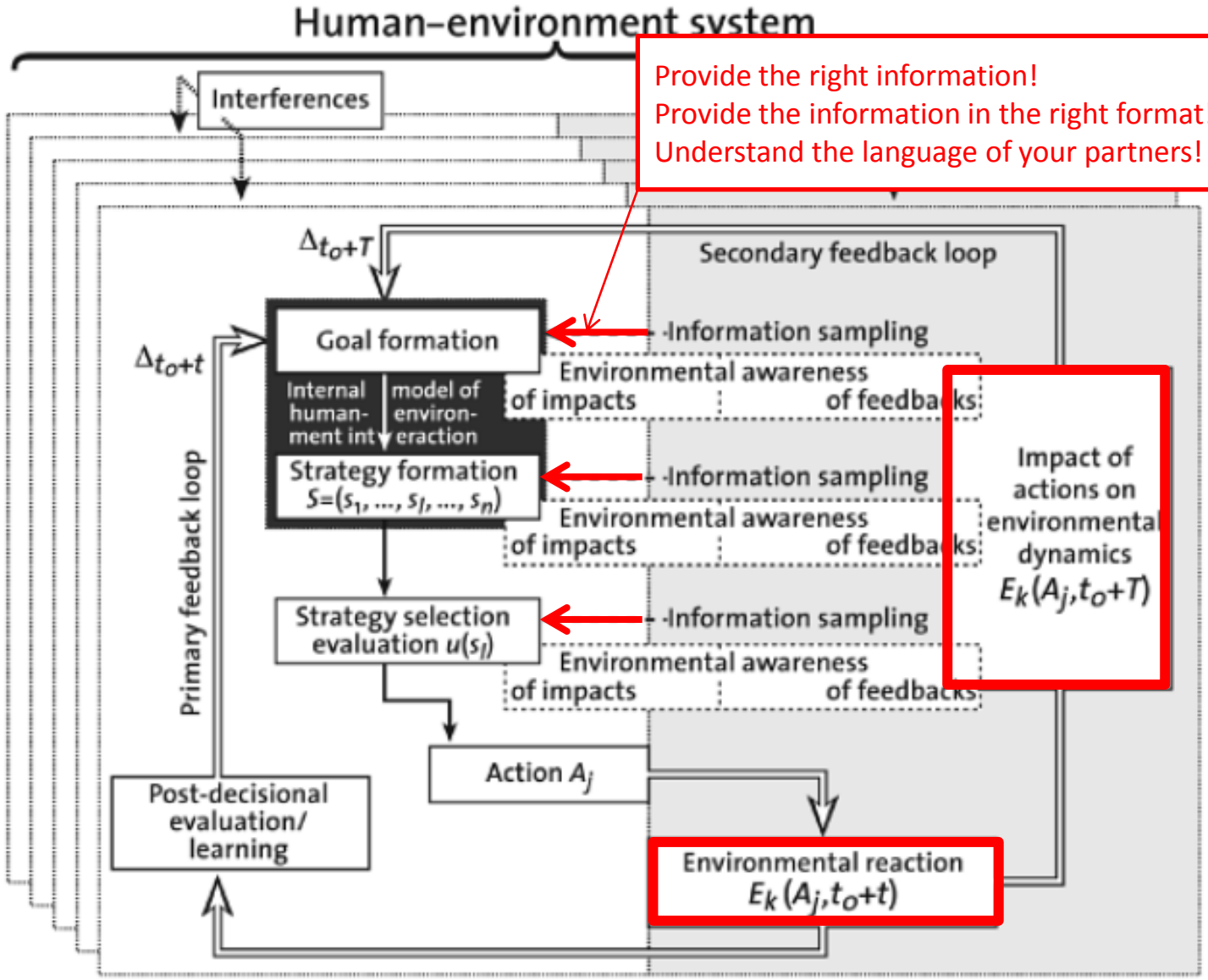
Source: United Nations; McKinsey Global Institute analysis

Introduction and background
Agriculture and Land-Use Change Emissions

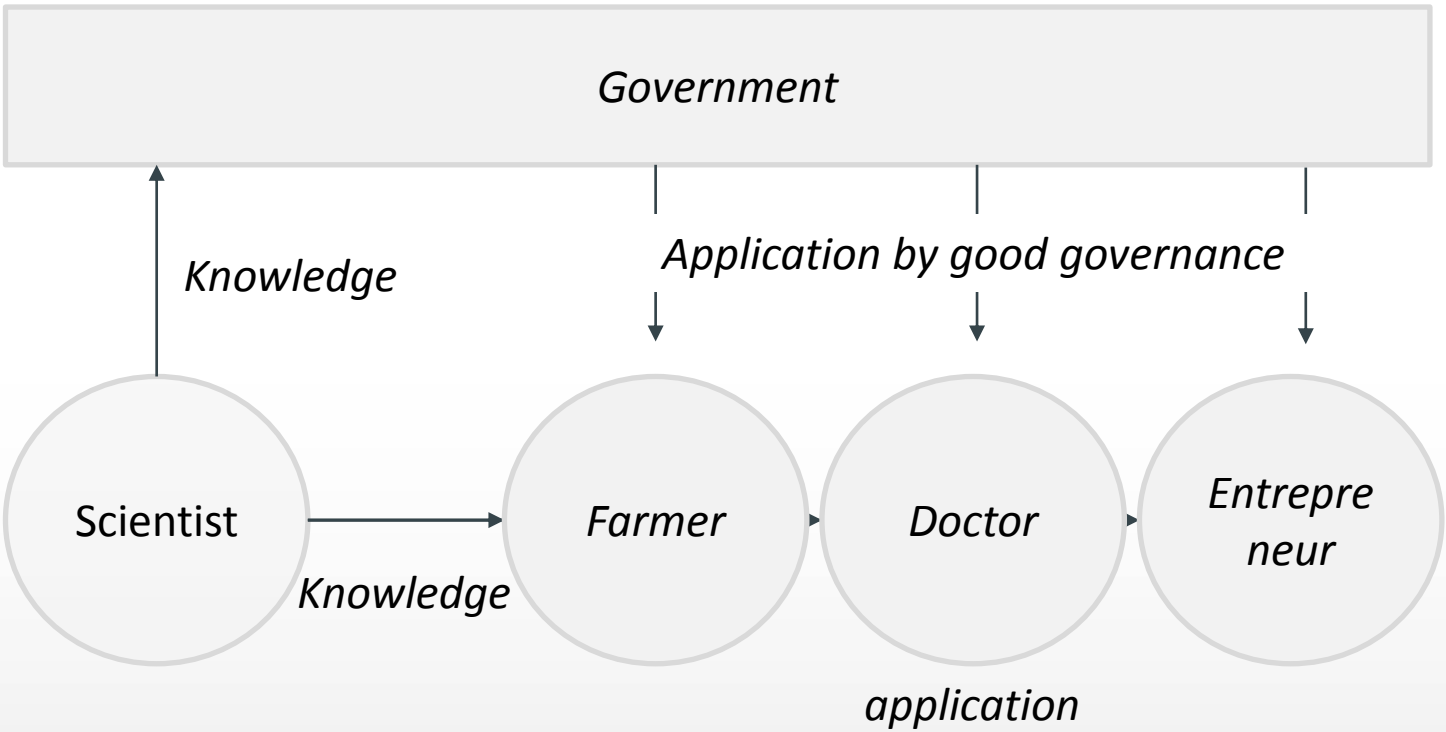


Introduction and background

Environmental Literacy
in Science and Society: From Knowledge to Decisions
By Roland W. Scholz, Claudia R. Binder



The role of science



What is a Research Infrastructure?

- facility to support scientists
- cooperation between many countries
- persistent
- standardized
- access
- open data
- impact on societies

Research Infrastructure are important in many disciplines

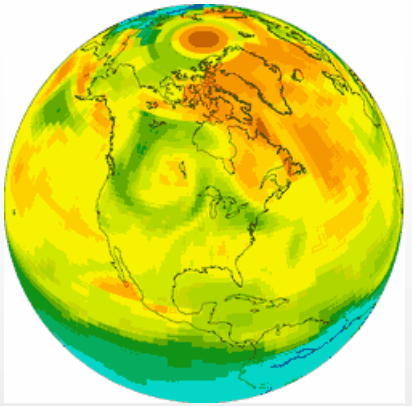
Social Sciences
Survey of Health, Ageing and Retirement in Europe

Health
Open Screening Platforms for Chemical Biology

- facility to support scientists
- cooperation between many countries
- persistent
- access
- open data
- impact on societies

Research Infrastructures can also be distributed

Environment
Greenhouse gas observations



ICOS (Integrated Carbon Observation System)

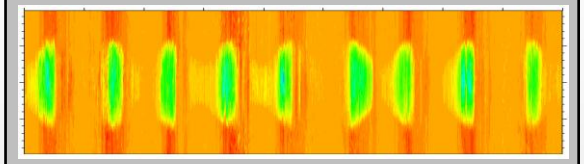
All important parameters

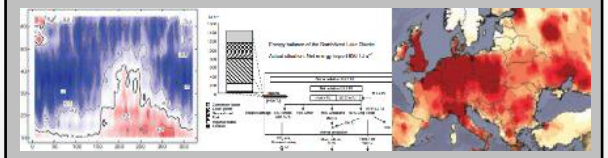
State-of-the-art techniques

Representative networks

Relevant data products

Optimum data streams





A community to produce higher-level output

Long-term financial security of all partners

Focus of SEACRIFOG

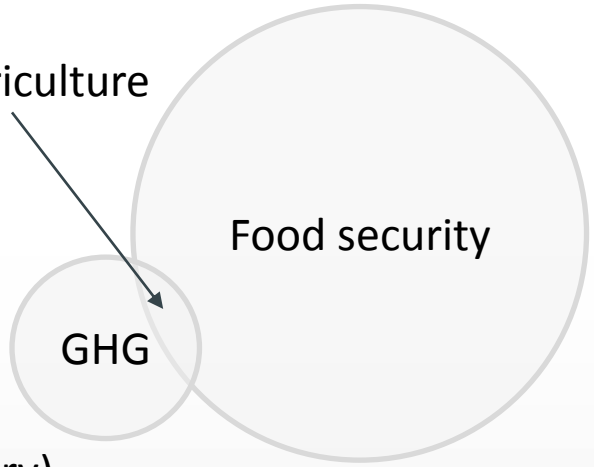
The focus of the project is the **design of an adaptive concept for a pan-African observational system on radiative forcing (GHG and aerosols).**

Special emphasis will be put on:

- land-use, land-use change and **climate-smart agriculture**

but also
on **other factors influencing emissions:**

- oceanic sources and sinks
- uncertainties in fluxes…



Design for **the future of Africa:**

- prospective emission trajectories (transport, energy, industry)…
- national reporting demands in the UNFCCC framework
- Sustainable Development Goals

Access to and interoperability of emission data will be a crucial element

Why is this important for Africa?

Knowledge increases options

Cooperation has to be guided

- by existing local knowledge
- by a definition of the local societal needs
- by the resulting local knowledge requirements

Cooperation has to adapt

- Africa has its own scientific questions
- Africa develops applied technologies

"A Euro-African project, not a European project in Africa"

Partners of SEACRIFOG

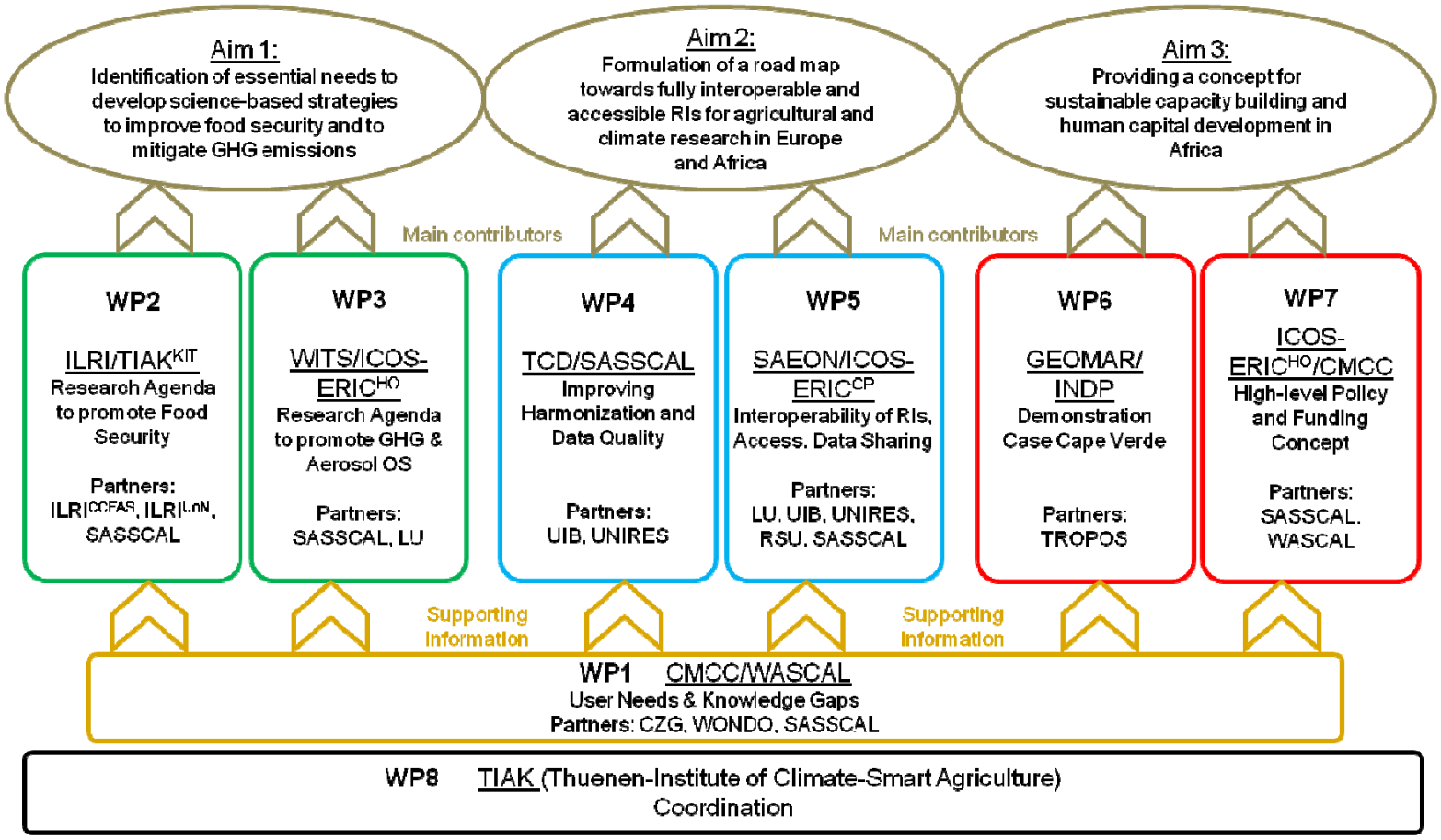
16 partners…

… from 12 countries

5 (+ 2) in Africa
Cabo Verde (INDP), Ghana (WASCAL), Kenya (ILRI), Namibia (SASSCAL), South Africa (SAEON, Univ. Witwaterstrand)
+ Ethiopia (Wondo), Sudan (Univ. Hawassa)

7 in Europe
Czech Republic (CzechGlobe), Finland (ICOS), Germany (Thünen - coordinator, GEOMAR, TROPOS), Ireland (TCD), Italy (CMCC), Norway (Univ. Bergen, UNIRes), Sweden (Univ. Lund)

Structure of the SEACRIFOG project



Aims of SEACRIFOG

Three different approaches

– **a top-down approach to establish a research agenda** regarding climate-smart agriculture and observation of GHG emissions: define demands and variables, analyze needs and gaps, identify existing networks to cooperate with…

– **a bottom-up approach to define the requirements for the production** of relevant, standardized and interoperable data: define key environmental observational parameters, assess technical feasibility, control data quality…

– **a practical approach to root the concept in reality:** design a demonstration case that will articulate different (international, regional, national) levels and different (atmospheric, oceanic) components, perform capacity-building, ensure the sustainability of the proposed options by setting up a high-level platform with national, regional and global actors, as well as innovative partners (private sector)…

Our direct stakeholders