Science diplomacy and developing communities

Igle Gledhill

University of the Witwatersrand
Johannesburg
South Africa

Christine Darve

European Spallation Source, European Research Infrastructure Consortium, Lund, Sweden

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The Fine print:

We make no claim that this is in any way a definitive guide to science diplomacy; instead, it is a **think-piece** that might be useful

These slides will be made available: they **include** some dense supporting text and references

which will not be used in the presentation
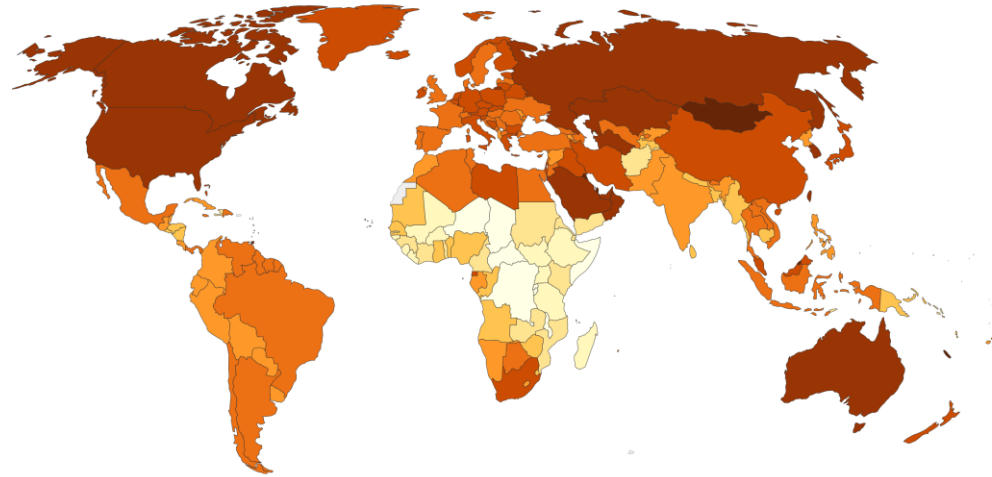
1 Is there a need for science diplomacy?

- A shining example

Africa produces the least greenhouse gases and is least equipped for adaptation

Per capita CO₂ emissions, 2020
Carbon dioxide (CO₂) emissions from the burning of fossil fuels for energy and cement production. Land use change is not included.
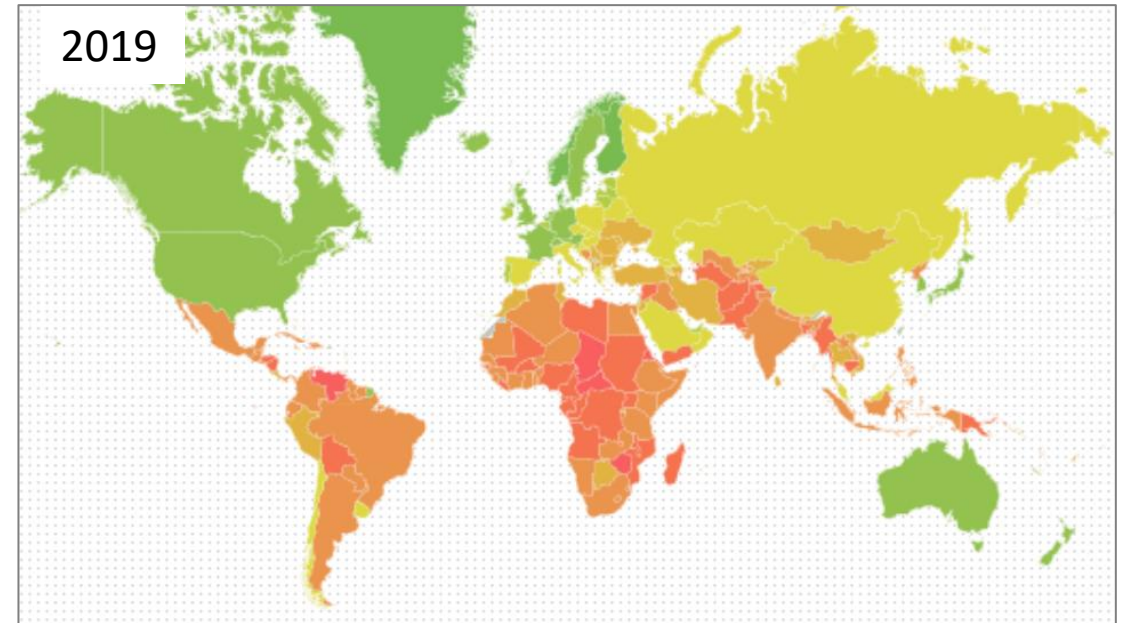
Our World in Data

No data   0 t   0.1 t   0.2 t   0.5 t   1 t   2 t   5 t   10 t   20 t

Source: Our World in Data based on the Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY
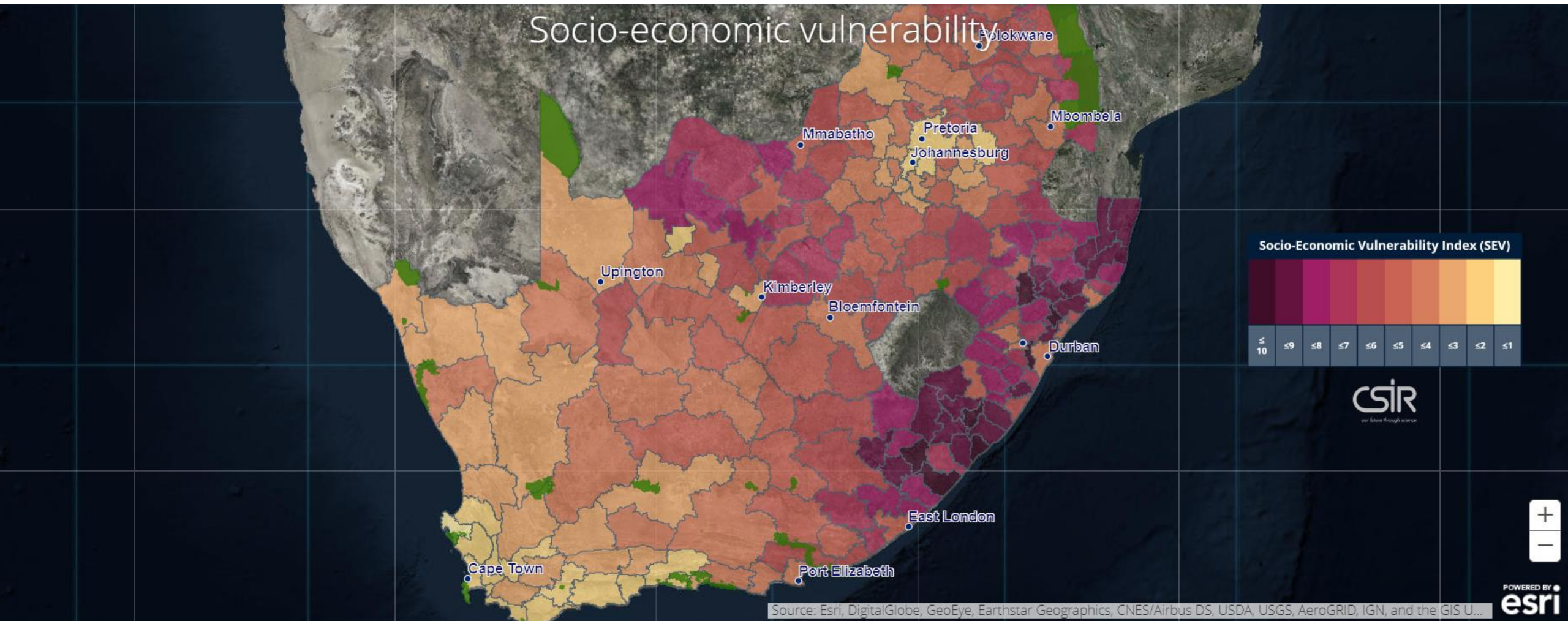
2019

ND-GAIN COUNTRY INDEX   ND-GAIN MATRIX   READINESS

Worse   Better

Per capita CO₂ emissions 2020

ND-GAIN Readiness index by country

https://ourworldindata.org/12-key-metrics#12-co2-emissions
https://gain.nd.edu/our-work/country-index/

4

Communities: Socio-economic vulnerability including to climate change hazards

- Communities in Africa are changing fast
- Cities and urbanisation
- Agriculture and pastoralism
- Food security, water security, human security
- Internet access, digital economies, social media

- Role of science potentially more useful than ever before
- Contribution to quality of life
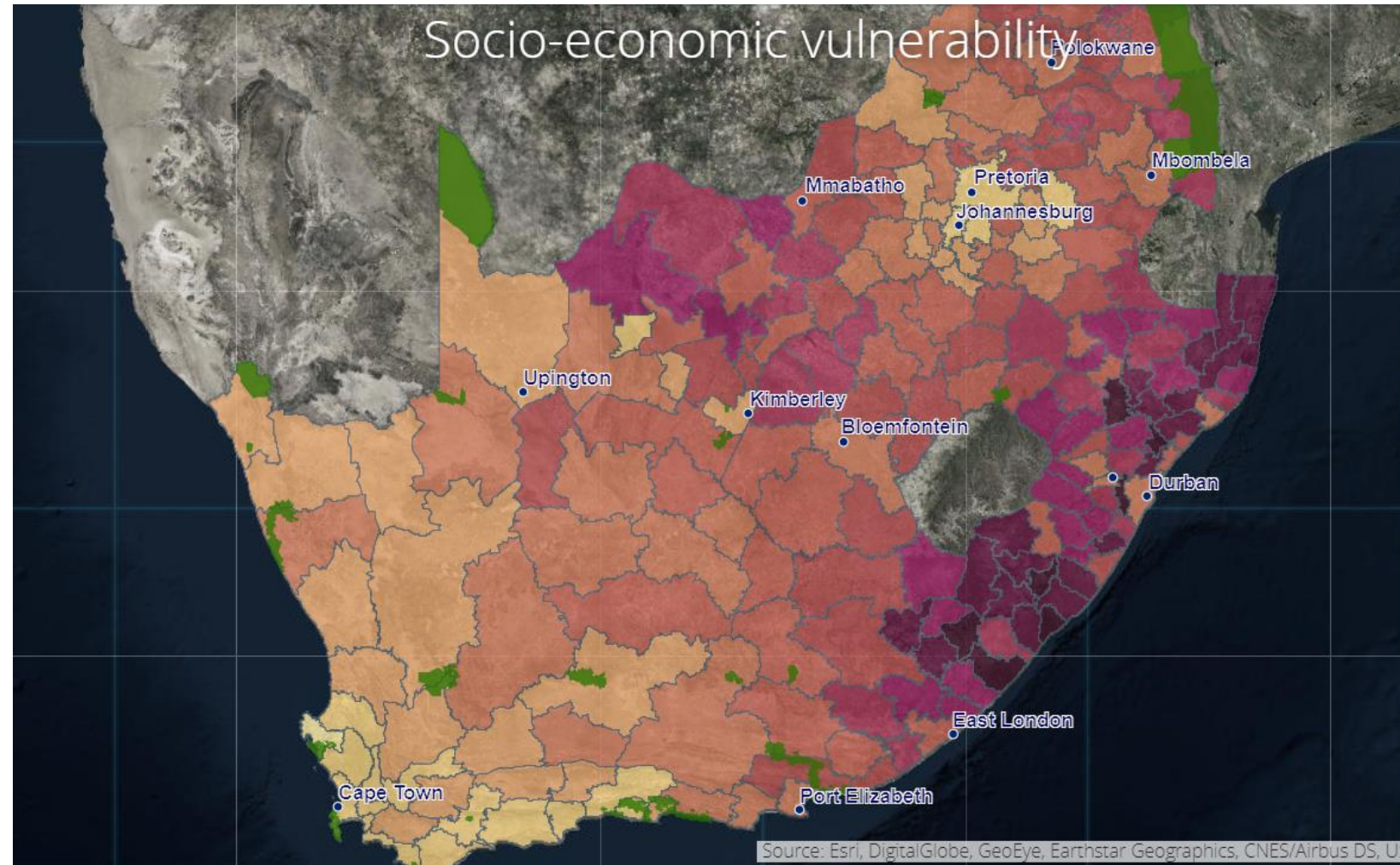
2 Is there a language to learn?

- A conceptual framework
- New paradigms
- Think of it as a collaboration

Diplomacy:

- the profession, activity, or skill of managing international relations
- the art of dealing with people in a sensitive and tactful way

- https://www.google.com/ Google's English dictionary is provided by Oxford Languages

- https://languages.oup.com/google-dictionary-en/

Science Diplomacy:

(1) <u>science to assist diplomacy</u>

The use of science to improve relations between countries

 e.g. Science20 meetings with G20 meetings (which AU has now joined) [not Astronomical Units, African Union]

Scientists work together across or underneath political boundaries

(2) <u>diplomacy to assist science</u>

 agreements to foster scientific projects

 e.g. Agreements underpinning Square Kilometre Array

Science:

- ## How shall we use the word "science" in this context?

- The term 'science' **signifies the enterprise whereby humankind, acting individually or in small or large groups, makes an organized attempt,** in cooperation and in competition, by means of the objective study of observed phenomena and its validation through sharing of findings and data and through peer review,

- **to discover and master the chain of causalities, relations or interactions;** brings together in a coordinated form subsystems of knowledge by means of systematic reflection and conceptualization;

- **and thereby furnishes itself with the opportunity of using, to its own advantage, understanding of the processes and phenomena occurring in nature and society.**

- Suggested usage from the 2017 UNESCO Recommendation on Science and Scientific Researchers UNESCO, Records of the General Conference, 39th session Paris, 30 October – 14 November 2017, Volume 1, Resolutions 1(a)(i) https://unesdoc.unesco.org/ark:/48223/pf0000260889

The principle of freedom and responsibility in science:

For science to progress efficiently and for its benefits to be shared equitably, scientists must be afforded scientific freedoms.

This includes individual freedom of **enquiry and exchange of ideas**, freedom to reach **scientifically defensible conclusions**, and institutional freedom to apply collectively scientific standards of **validity, replicability and accuracy**.

International Science Council ISC, The Principle of Freedom and Responsibility in Science https://council.science/wp-content/uploads/2020/06/ISC-Statutes-and-Rules-of-Procedure_02.2021.pdf
https://council.science/what-we-do/freedoms-and-responsibilities-of-scientists/

The language of science diplomacy: example

global

Global Competitiveness

SDGs

regional

BRICS

OECD

G20
भारत 2023 INDIA

African

AGENDA 2063

South African

NDP 2030

Departmental

science & innovation
Department
Science and Innovation
REPUBLIC OF SOUTH AFRICA

SCIENCE TECHNOLOGY AND INNOVATION DECADAL PLAN 2022-2032
Science, technology and innovation enabling inclusive, sustainable South Africa development in a changing world

SOUTH AFRICA FORESIGHT EXERCISE FOR SCIENCE, TECHNOLOGY AND INNOVATION 2030

science & innovation
Department
Science and Innovation
REPUBLIC OF SOUTH AFRICA

NACi
NATIONAL ADVISORY COUNCIL ON INNOVATION

specific

Science Engagement Strategy

National Research Big Data Strategy for South Africa

Alignment: use the big projects

There is alignment with, among others,

- IYBSSD, the International Year of Basic Sciences for Sustainable Development, Chair of Steering Committee: Michel Spiro, https://www.iybssd2022.org/

- The call to action issued by IoP, the Institute of Physics, London https://www.iop.org/strategy/physics-climate-change-sustainability/global-green-economy

- The long-standing actions of ISC, the International Science Council https://council.science/publications/the-international-council-for-science-and-climate-change/

- The proclamation by the United Nations General Assembly of 2024 to 2033 as the "International Decade of Sciences for Sustainable Development" (IDSSD) https://www.iybssd2022.org/en/an-international-decade-of-sciences-for-sustainable-development/

3 Extend to local communities?

Community:

- Relationship between science and society
- Science serves different kinds of communities:
  - Local community
  - The students – where they're coming from, and where they're going to
  - The interests of the nation: educated sons and daughters
  - The economic community
  - The global scientific community
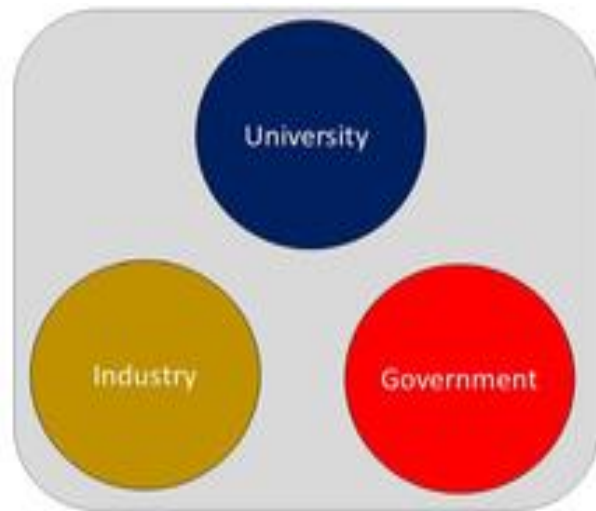 - Global society

Developing:

For nations,

- World Bank Gross National Income per Capita classification of nations

- a metric to estimate the relative wealth of nations

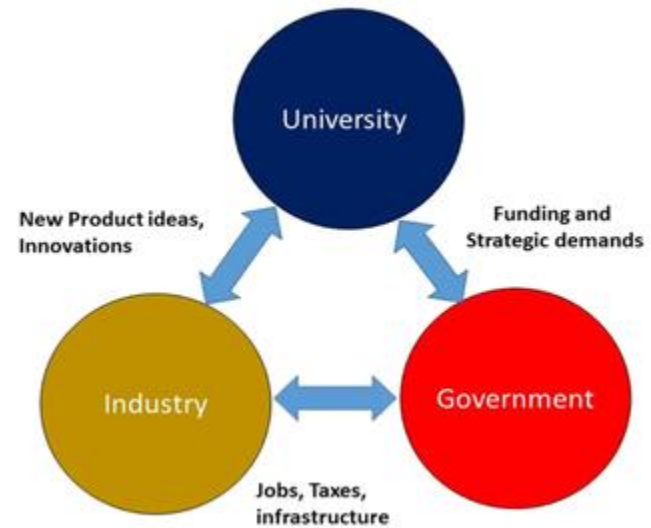- Low and Lower Middle Income countries

Developing: an innovation view

- ## The triple helix model of innovation

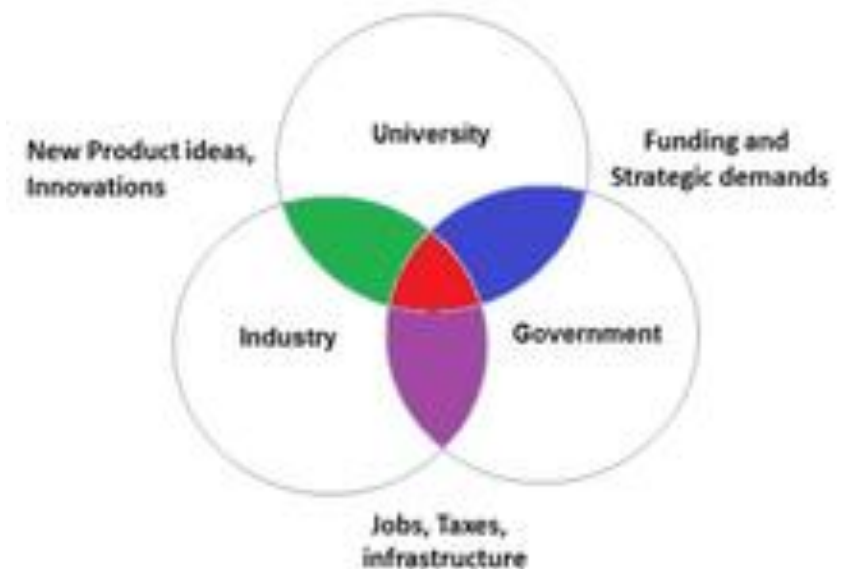"silos" – no or low interaction | Beginning of triple helix | Developed triple helix; red - science park

Etzkowitz, Henry; Leydesdorff, Loet (1995). *EASST Review*. **14**: 14–19
https://en.wikipedia.org/wiki/Triple_helix_model_of_innovation images
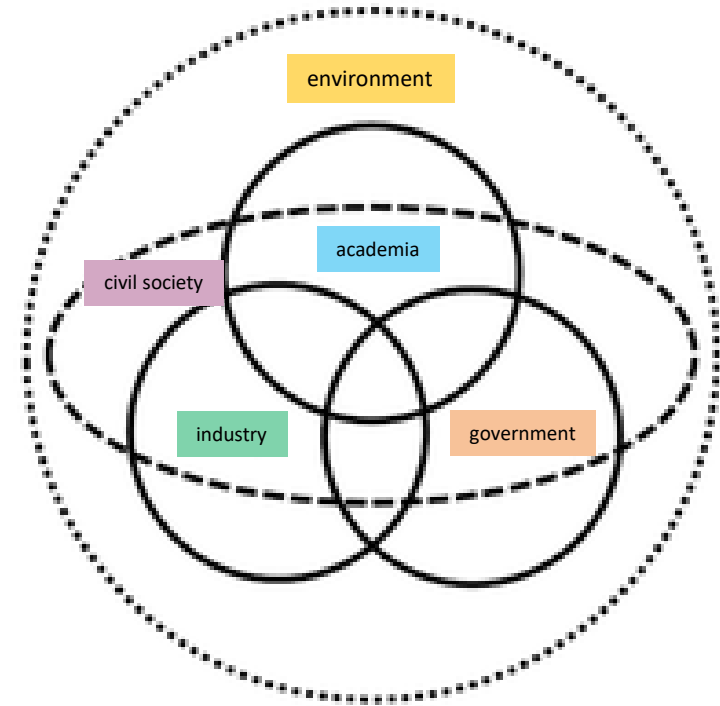
Higher order models
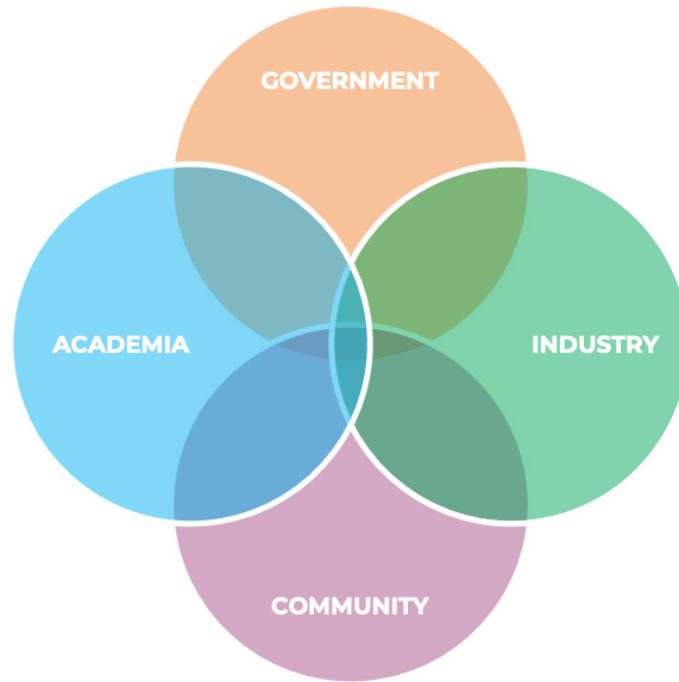
- 4-helix: the public
- 5-helix: the natural environment

Peris-Ortiz, Marta; Ferreira, João; Farinha, Luís; Fernandes, Nuno (2016-05-27). *Multiple helix ecosystems for sustainable competitiveness*. Cham: Springer. pp. 1–14 . image https://grrip.eu/why-is-quadruple-helix-engagement-so-important/

Higher order models

- Mode 1: universities <u>alone</u>

- Mode 2: knowledge <u>in context</u>
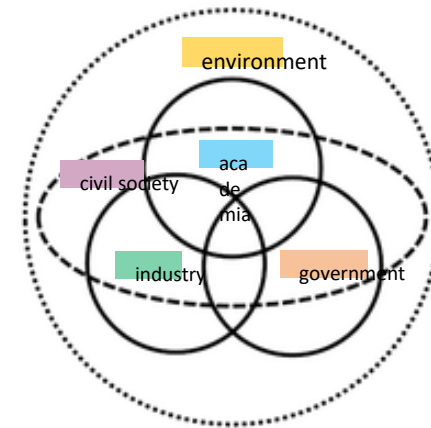
- Mode 3: <u>coexistence and co-development</u> of diverse knowledge and innovation modes
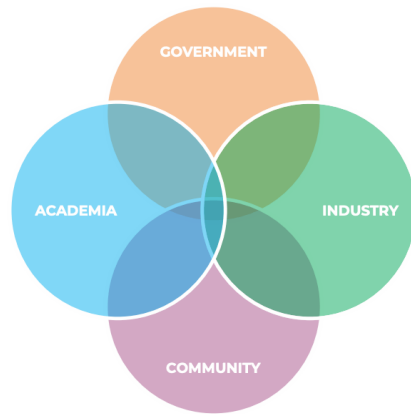

Peris-Ortiz, Marta; Ferreira, João; Farinha, Luís; Fernandes, Nuno (2016-05-27). *Multiple helix ecosystems for sustainable competitiveness*. Cham: Springer. pp. 1–14 . image https://grrip.eu/why-is-quadruple-helix-engagement-so-important/

4 Enablers and challenges?

- Think of science diplomacy as a project
- Are there **proven** ways to overcome challenges?

Enablers and challenges

- For projects involving science diplomacy
  - Diplomatic and local
- Some potential solutions from an evaluated programme

4 Enablers and challenges

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Transdisciplinary research,

sustainability across African cities

International Science Council research funding programme

Theory of change models

- Participation

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- Adaptive management

https://council.science/current/news/lira-reports/

Photos: ISC

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- *"If* this is done, *Then* these are the anticipated results"
    - Early outcomes must be in place for intermediate outcomes to be achieved…an outcomes pathway

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Photos: ISC

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- Quality control
  - plausibility
  - feasibility
  - testability

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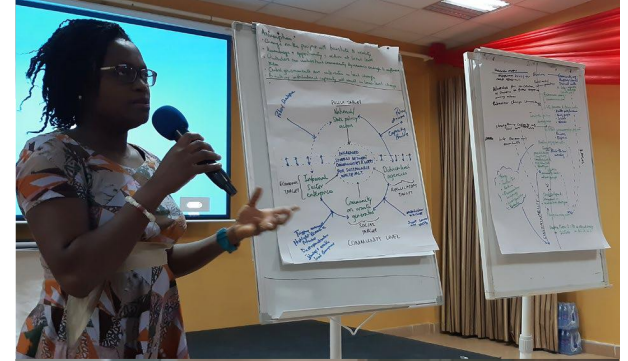Photos: ISC

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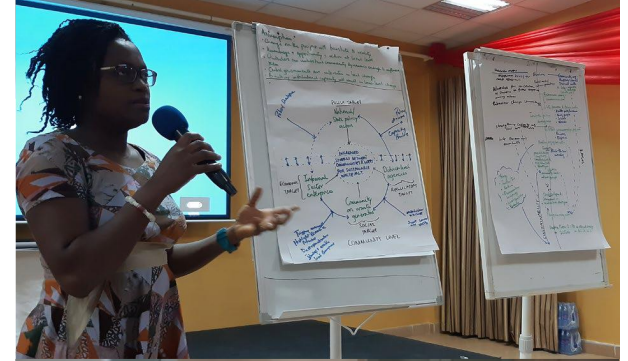   - Early outcomes must be in place for intermediate outcomes to be achieved…an outcomes pathway

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- Assessing change

https://council.science/current/news/lira-reports/

Photos: ISC

A formal project approach
this is a collapsible part of the presentation

- **Teams review their own assumptions**
  - **assumptions about how societal change unfolds,**
  - and the role of knowledge processes
- **Enablers and challenges**
  - **Self-reflection built into programme**
  - **Allow and expect changes to project**: venues, timing to be more inclusive of stakeholders; complex fund transfer, procurement processes
  - Build trust: with communities, local languages (ref. SKA)
  - Fluidity of partner participation, change of incumbents in jobs, personal networks useful
  - **Tense political climates, and conflict: they delay, and mean replanning**
  - Someone maintains ongoing engagement: typically an appointed Principal Investigator, Team Chair
  - **Different partner agendas and expectations, competing conceptions and understandings of the project goals, competing partner commitments**

https://council.science/current/news/lira-reports/

Include context knowledge
this is a collapsible part of the presentation

- Context knowledge
  - Research design can't be cut and pasted across to other communities
  - **Significance of personal networks**
  - **Local languages an advantage**
  - Take opportunities to amplify a project:
    - When partners receive an award or when the timing of a project coincided with an opportunity to give input to a policy intervention
  - Training staff from relevant local authorities helped to begin to bridge the science-policy divide
  - Changes in personnel affect science communication
  - Research fatigue occurs in communities

https://council.science/current/news/lira-reports/

- **acknowledge community members as knowledge producers and experts of their lived experiences**
- need to understand not only the governance landscape but also the structural issues that underpin governance,
- such as power, gender, political processes and poverty
- a better understanding of the blockages that cause bottlenecks and the logic behind government responses or the lack thereof

We have... learned the value of humility, in the sense that we have had to strip ourselves of numerous assumptions we had prior to going into the 'field', and instead pay attention to the wisdom from the lived experiences of other stakeholders.'

- the translation of global agendas at the local level, driven by <u>local</u> priorities

- highlighting blind spots in global policy agendas

- shifting the dominant centres of knowledge production <u>on</u> Africa from the global north <u>into</u> Africa

- create a project Open Access fund for dissemination

Science for society: the bottom line

- Covid-19
- "wash your hands"
- - of course, this is not possible for everyone

Science for society: the bottom line

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- Early Warning for hazards: floods, cyclones, fires
- Medium term warning: droughts, change of seasonal variation
- Long term warning: heatstroke, pandemics, climate emergency

Science for society: the bottom line

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- Two of the most common elements of the dialogue:
- "why didn't you warn us?"
- Planning
- "why didn't you plan for this?"

5. Summing up

1 Is there a need for science diplomacy?

Yes. Climate change is only one example.

2 Is there a language to learn?

Yes. There's a new conceptual framework for scientists.

3 Extend to local communities?

Yes. Implementation depends on this.

4 Enablers and challenges?

Yes, we learn as we go.