

Science in support of the SDGs



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(& CSIRO, Australia)**

Tokyo

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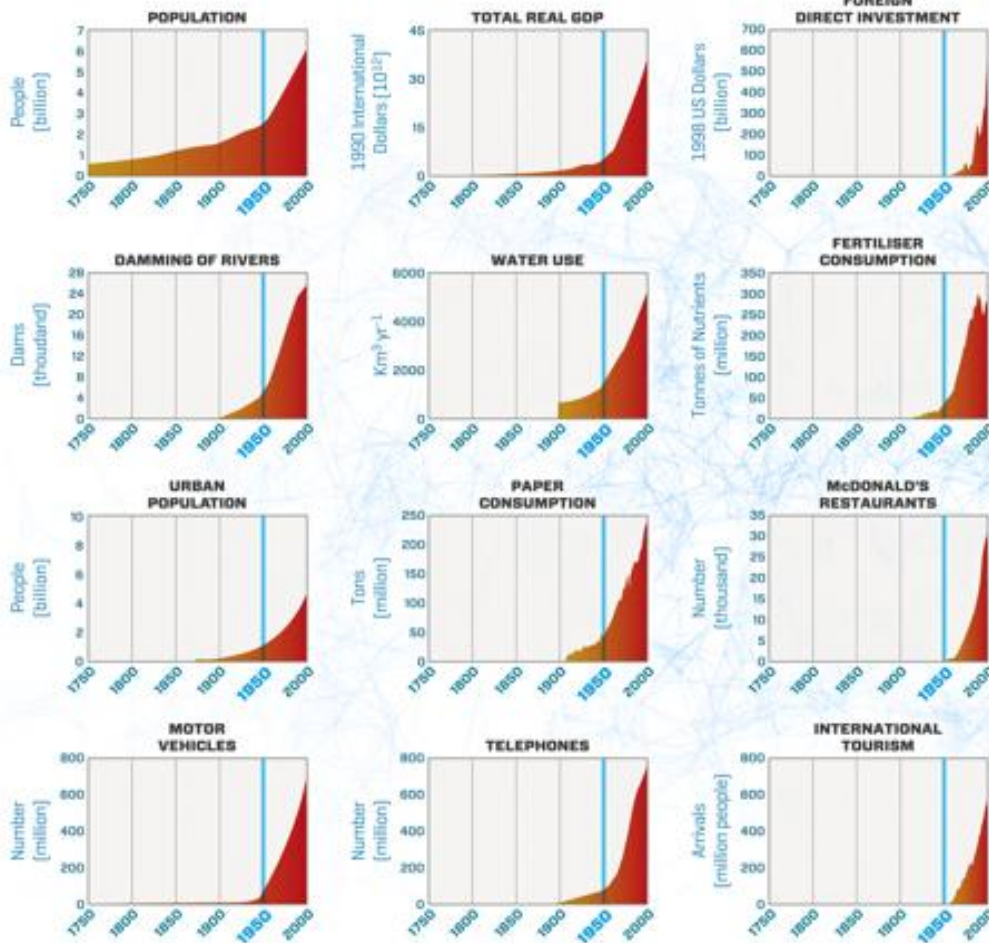
Where I am going...

- **Driving needs**
 - A more nimble global innovation system...
- **Input to the current drafts**
 - Some recent thoughts
- **A future science-policy interface?**

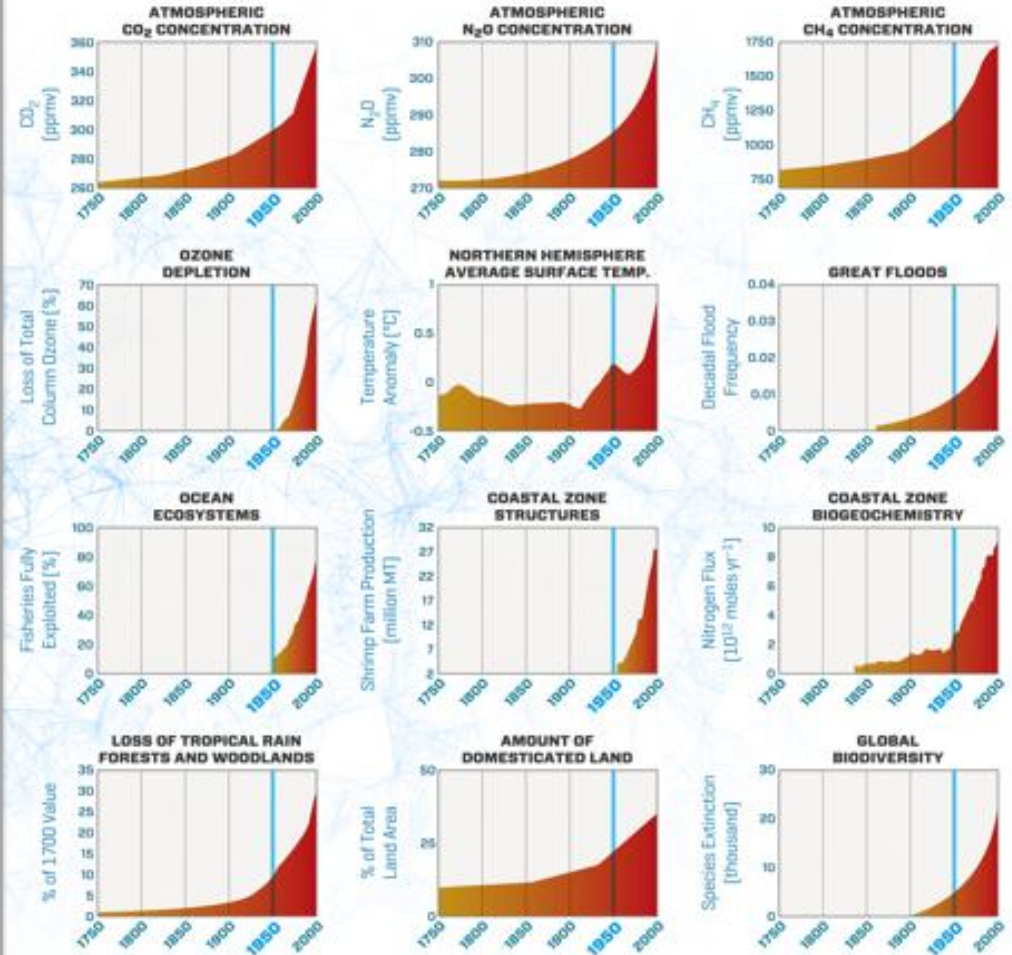


'Great Acceleration'

Drivers



Impacts



Complex challenges in the Anthropocene

- **Feeding** nine billion people within planetary boundaries
- Reducing **disaster** risks
- Valuing and protecting **nature's services** and biodiversity
- **Adapting** to a warmer and more **urban** world
- Transitioning to **low carbon** societies
- Providing income and innovation **opportunities** through transformations to global sustainability
- Improving **equity**
- Estimating wealth and **well-being**, not GDP
- Aligning **governance** with stewardship



... mostly complex social-ecological issues

What is Future Earth?

- A **global platform** for international research collaboration on global environmental change and sustainable development
 - Providing **integrated research** on major global change challenges and transformations to sustainability
 - Strengthening partnerships between researchers, funders and users of research through **co-design** of research
 - **Solutions-oriented**, aiming to generate knowledge that contributes to new more sustainable ways of doing things
 - **Communicating** science to society and society to science
- *Responds to the need for a more nimble innovation system for global sustainability in the face of increasing rates of change*

Transition
Team
2011–2012



Future Earth



2013



Earth System
Science Partnership
2001

WCRP

World Climate Research Programme

Established
1980

GLOBAL
IGBP
CHANGE

International
Geosphere-Biosphere
Programme

1987



DIVERSITAS

1991



IHDP

International Human Dimensions Programme
on Global Environmental Change

1996

futurearth

Science and Technology Alliance for Global Sustainability



ICSU

International Council for Science



UNITED NATIONS
UNIVERSITY

future^{earth}
research for global sustainability



international social science council



United Nations
Educational, Scientific and
Cultural Organization



INTERNATIONAL GROUP OF
FUNDING AGENCIES FOR
GLOBAL CHANGE RESEARCH



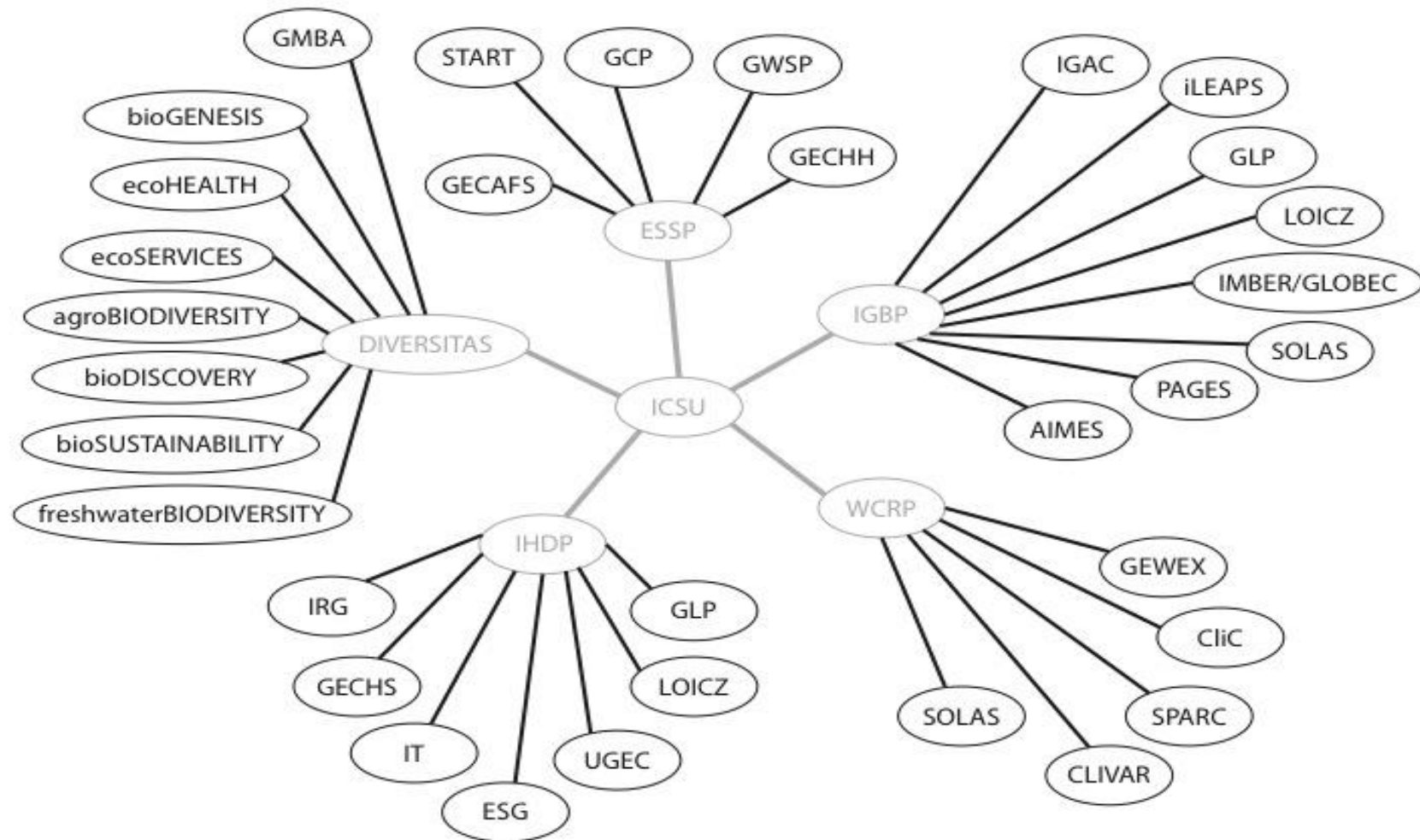
UNEP



WMO
(observer)

future^{earth}

GEC Core Projects



Calling on >60,000 scientists worldwide

Where have we got to with SDGs?

- **OWG Report**
- **Scientific input – limited despite Rio+20 intents**
 - Often as (well-intentioned) lobbyists
 - Not much coordinated as “trusted advisor”
 - Some key integrated areas – e.g. governance

Where have we got to with SDGs?

- OV
- Sci

POST2015/UNU-IAS Policy Brief #4

Coherent Governance, the UN and the SDGs

Steven Bernstein, Joyeeta Gupta, Steinar Andresen, Peter M. Haas, Norichika Kanie, Marcel Kok, Marc A. Levy, and

Key Messages:

1. The Sustainable Development Goals (SDGs) require appropriate institutions to be effectively integrated into institutions and practices, to coordinate activities, and implementation. The High-Level Political Forum on Sustainable Development, as the "orchestrator of orchestrators" towards these ends, but will require high-level modalities for North-South dialogue, and links with "intermediaries" within countries and stakeholders, and incentivize implementation processes that are systemic, science-based and multi-dimensional, and focus on common challenges, international institutions, and non-state actors and networks. State-led mutual review of national sustainable development progress could be organized around common challenges – for example countries running out of water. Such reviews would provide systemic evaluation of the SDGs over time as new knowledge becomes available.
2. Monitoring and review processes are crucial to ensure accountability, systemic, science-based and multi-dimensional, and focus on common challenges, international institutions, and non-state actors and networks. State-led mutual review of national sustainable development progress could be organized around common challenges – for example countries running out of water. Such reviews would provide systemic evaluation of the SDGs over time as new knowledge becomes available.
3. The new Global Sustainable Development Report (a collection of assessments from other actors), part of the HLPF's mandate to improve the science-policy interface, should also bring together knowledge required to identify cause-effect relationships and transition pathways, possibly over time. Governance of the SDGs should be designed to mobilize actors and networks. This diversity in means of implementation must be balanced to ensure accountability, responsibility, coherence and capacity to link for sustainable development.

POST2015/UNU-IAS Policy Brief #6

Ending the Double Burden of Malnutrition: Addressing the Food and Health Nexus in the Sustainable Development Goals

Masahiko Iguchi, Tomoki Ehara, Eri Yamazaki, Tomohiro Tasaki, Naoya Abe, Seiji Hashimoto and Taro Yamamoto

Highlights:

1. While the prevalence of undernourishment will decline by 2030 through various efforts by various stakeholders, eradicating undernourishment will not be achieved solely through economic growth.
2. Improvement in economic conditions for individuals and communities may lead to higher risks of obesity unless the issue is appropriately addressed by the Sustainable Development Goals (SDGs), correlating targets and indicators, and delivery of educational programmes to increase health literacy globally.
3. To approach ending the double burden of malnutrition and the challenge of dealing with undernourishment and obesity, more focus should be placed on eliminating food disparity. We recommend setting an ambitious nutritional distribution disparity target: to reduce the Interquartile Range (IQR) of the distribution of caloric intake by 50%.

Addressing the double burden of malnutrition

To "Eradicate extreme poverty and hunger" is the first of the eight Millennium Development Goals (MDGs). To achieve the "end hunger" target, we argue that a focus solely on the pursuit of economic growth is not sufficient, but a fair distribution of nutrition among people is also required to address issues of undernourishment and obesity.

Although the proportion of undernourished people in developing countries has decreased from 24% in 1990 - 1992 to 14% in 2011 - 2013, the goal to halve the percentage of people suffering from hunger by 2015 will require further efforts. For instance, 162 million young children are still suffering from chronic undernutrition (UN 2014a).

In 2012, the UN Secretary General initiated the "Zero-Hunger Challenge," which emphasized the dire need to end hunger. Recently, more attention has been directed towards addressing the double burden of malnutrition, which is defined as undernutrition and obesity occurring simultaneously in and among different population groups.

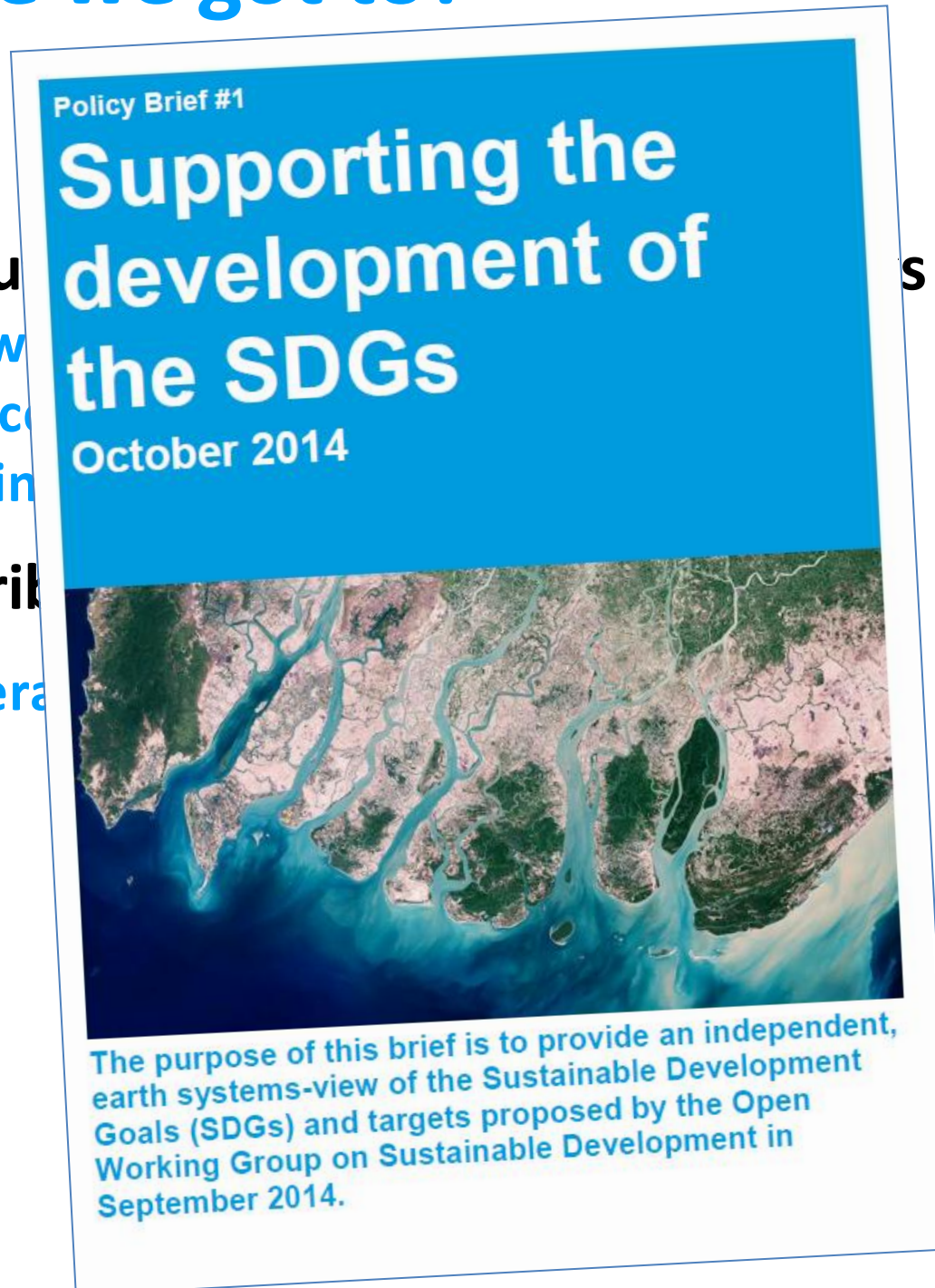
Obesity is recognized as a major risk factor for a number of chronic diseases including diabetes, cardiovascular conditions and cancer. According to the World Health Organization (WHO), obesity is responsible for approximately 3.4 million adult deaths each year (WHO 2014). This number is on the rise in both developed and developing countries.

The SDGs outcome document that has been adopted by the Open Working Group on SDGs (OWG) includes the following text related to the double burden of malnutrition:



Where have we got to?

- **OWG Report**
- **Scientific input**
 - Often as (w)
 - Not much c
 - Some key in
- **Belated contri**
 - More genera



Weaknesses?

- 1. Progress is remarkable, and we all want it to succeed!!**
 - Should still press gently for best possible outcome
- 2. Integrated targets and quantification...**
 - Pervasive issue, but least well-developed at human-environment interface

Synergies and trade-offs – avoiding silos

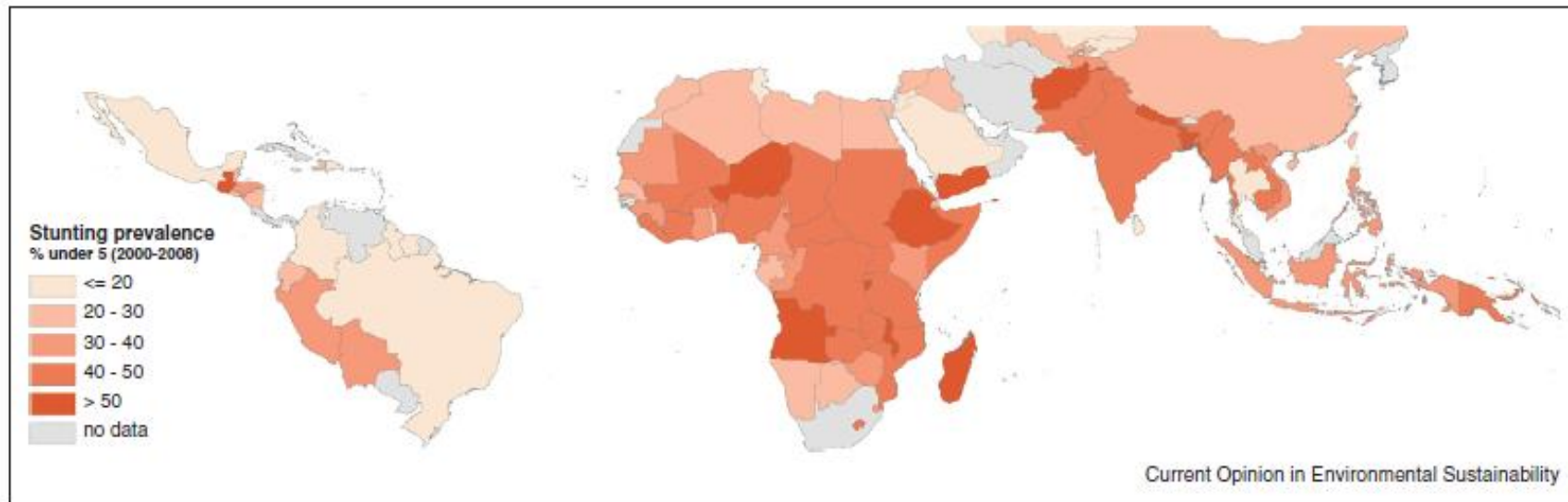
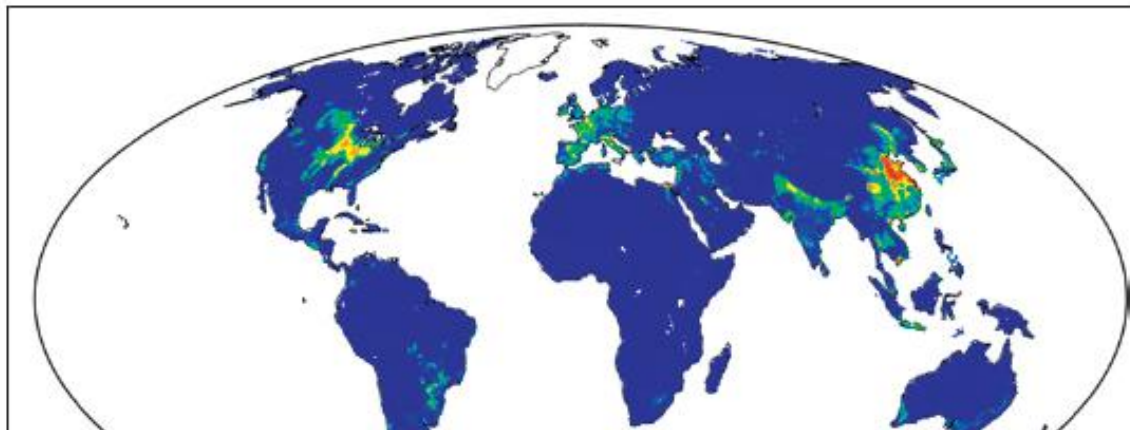
- **Synergies**

- **Achieve more than one goal at the same time where they work together**

- E.g. Local green energy for cooking, which reduces local pollution and CO2 emissions, improves health, frees up children and women to be educated, and reduces woodcutting impacts on biodiversity
- Addressing hunger and obesity simultaneously (and their relationship to economic growth) – *ESG Policy Brief #6*
- Control phosphorus use, while allowing poor regions to use more

Sustainability constraints not spatially homogeneous...

- E.g. overuse of phosphorus – have to care about its distribution (Lett, ERL 2011)



Countries experiencing chronic food insecurity, estimated using the prevalence of stunting in children under five years of age as an indicator. Note the

Sustainability constraints not spatially homogeneous...

- **E.g. overuse of phosphorus – have to care about its distribution**
 - Similarly land use change – concentrate it all in the Amazon and it affects the whole world's climate
 - Also aerosols, fresh water , chemical pollution, biodiversity
 - CO₂ emissions are *unusual* in being well-mixed!
- **Opens opportunities to meet global sustainability constraints in ways that achieve other goals, e.g. improve equity**

Synergies and trade-offs – avoiding silos

- **Synergies**

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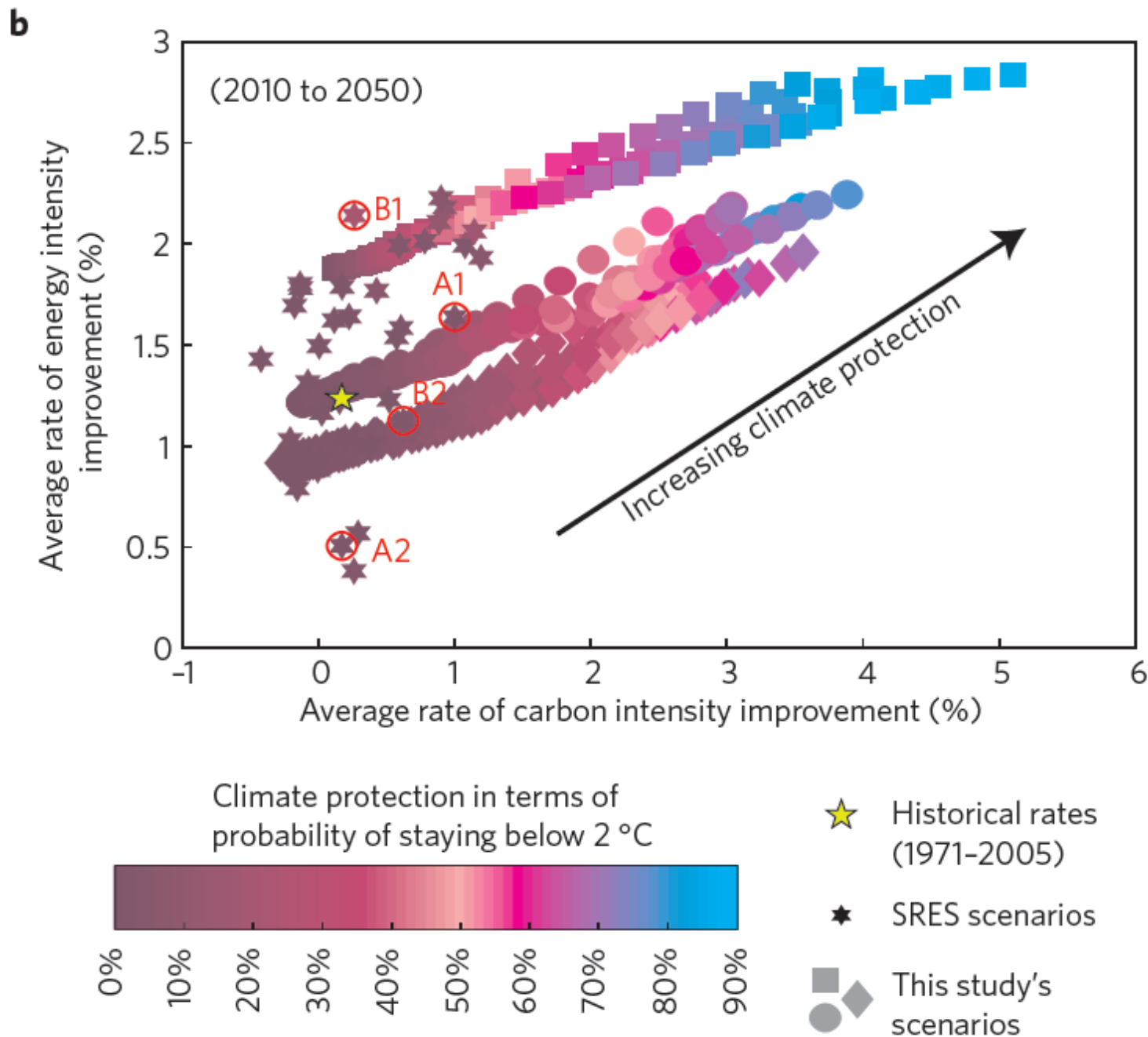
- **Trade-offs**

- **Recognise and minimise the problems where goals are in conflict**

- E.g. Lift people out of poverty without raising CO₂ emissions – this will involve more consumption, but the conflicts can be minimised with green energy, changed measures of well-being, and addressing economic inequalities.

Integrated t

- “Sustainable E
- Rogelj *et al.* as 2° C global w CO_2 emiss
- Answer? Ye



Rogelj *et al.* (2013). *Nature Clim. Change* **3**, 545-551

Integrated targets

- “Sustainable Energy for All” – adopted by the UN in 2013
- Rogelj *et al.* ask: can you have energy for all and stay within 2° C global warming?
$$CO_2 \text{ emissions} = \text{Carbon Intensity} * \text{Energy Intensity} * GDP$$

CO₂ per unit energy & energy use per \$

 - Answer? Yes, but only in certain ranges of CI and EC
- Hence have targets for economic growth (SDG#8), energy access (SDG#7) + lower emissions (SDG#13), but also for CI/EC
 - Then “sustainability and poverty eradication *can* go hand in hand with mitigating climate risks”, though the task remains ‘daunting’

Other integrated targets

- Placeholders mostly already in the list of targets, just non-specific in form or unquantified

Key interaction	Quantified integrated target [& where]
Nutrient use efficiency (N&P), particularly in food systems	Improve full-chain food systems nutrient use efficiency by 20% by 2020. [#2.4]
Water use efficiency in agriculture	Improve Water Productivity of all major food crops to 1000 m ³ /ton by 2030. [#6.4]
Food waste in full food systems	Reduce food losses by 50% along production and supply chains including post-harvest losses by 2030. [#12.3]
Energy intensity and energy efficiency	[#7.2/7.3] e.g. Increase global mean energy intensity by 2.4% p.a.
Fully costing externalities in ecosystem services	...[#12.8]
Non-renewable resource use	...[#9.4/#12.5]

But...is there value in imprecision???
e.g. to allow sign-off despite differences...
•A negotiating question of costs and benefits!

Weaknesses?

- 1. Progress is remarkable, and we all want it to succeed!!**
 - Should still press gently for best possible outcome
- 2. Integrated targets and quantification...**
 - Pervasive issue, but least well-developed at human-environment interface
- 3. Some global sustainability targets also missing or not explicit**
 - Global P and N use; global use of freshwater; release of pollutants and novel chemicals; etc
- 4. Overarching narrative of how this all adds up to global sustainability (and global human development?) not very clear?**

Moving forwards

- Contributing to a research-policy engagement platform for adaptive governance in the Anthropocene...



Moving forwards

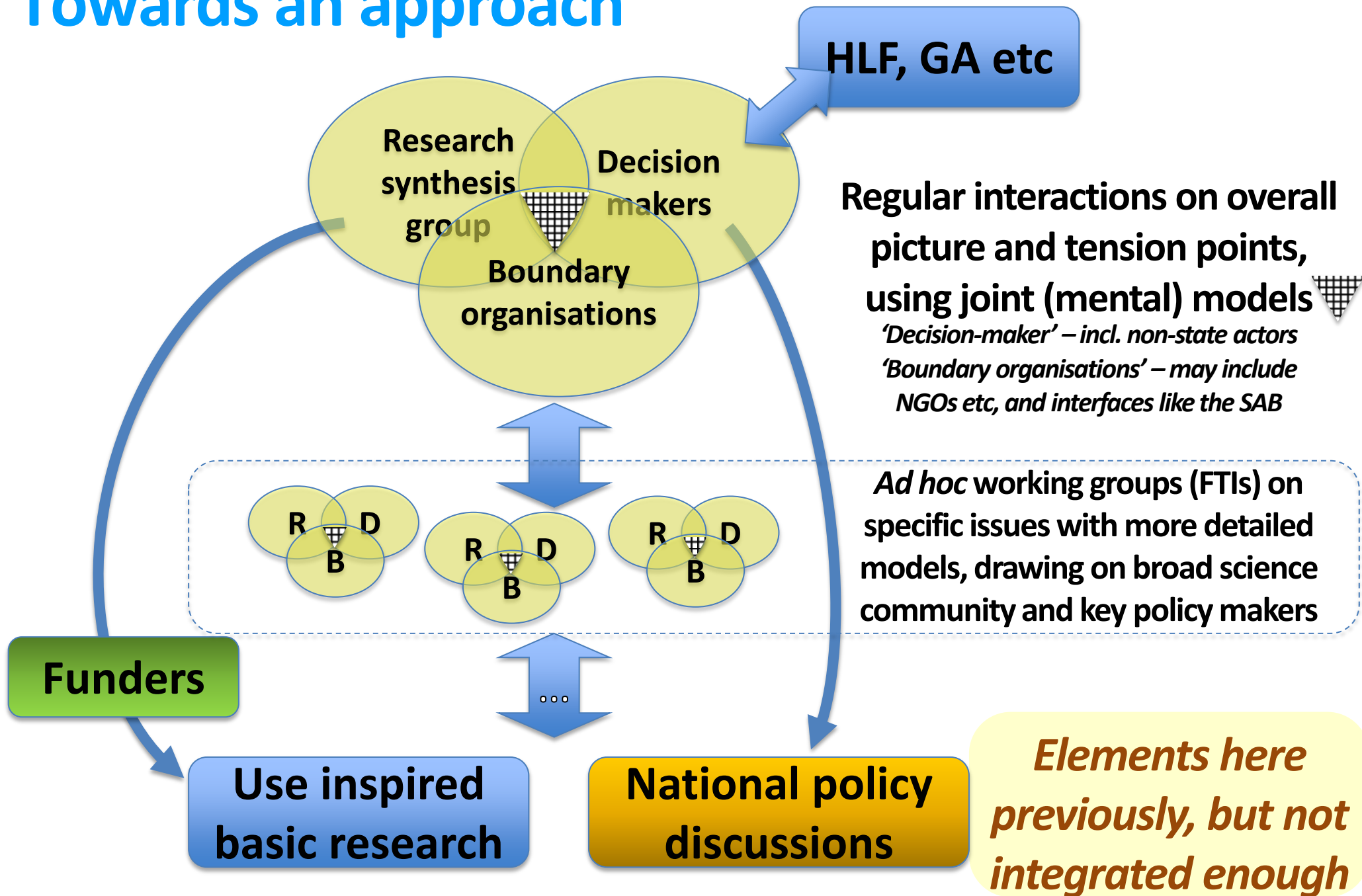
- **Contributing to a research-policy engagement platform for adaptive governance in the Anthropocene...**
- **Some questions that emerge:**
 - Does national and local action on each target add up to meeting the global target?
 - Does meeting the global targets add up to delivering on global sustainability and human development as envisaged by Rio+20?
 - What adjustments in efforts or targets (or indicators) might need negotiating over time?
 - What is missing and should be in SDGs version 2 (2030)?
- **How to assess these, credibly and nimbly?**

Thoughts towards an on-going, dynamic engagement platform...

- **Needs:**

- A coherent response from the research community, that networks diverse views – an expressed role for Future Earth
- Involvement of key interface bodies, that are more nimble than research
- Powerful commitment from policy players, including key individual negotiators in the on-going SDG and post-2015 process (but also non-state actors, etc)
- Continuous, regular and structured interactions, not 5-year assessments
- 2-way flow of information and priority setting
- ...

Towards an approach



Conclusions

- **We need a more nimble Global Innovation System!**
 - Decision-makers as well as researchers and non-state players
 - New knowledge but well-targeted, taken up in mental models of decision-makers faster; and old knowledge discarded
- **Current SDG proposals**
 - Vital (and remarkable) progress
 - Would be nice to see more quantification and integrated targets but not at the cost of agreement
- **What is the architecture of a truly supportive interactive platform for the next 15 years?**



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