

Introduction to sustainable development goals by using soil-human microbiota as a case

Eeva Furman

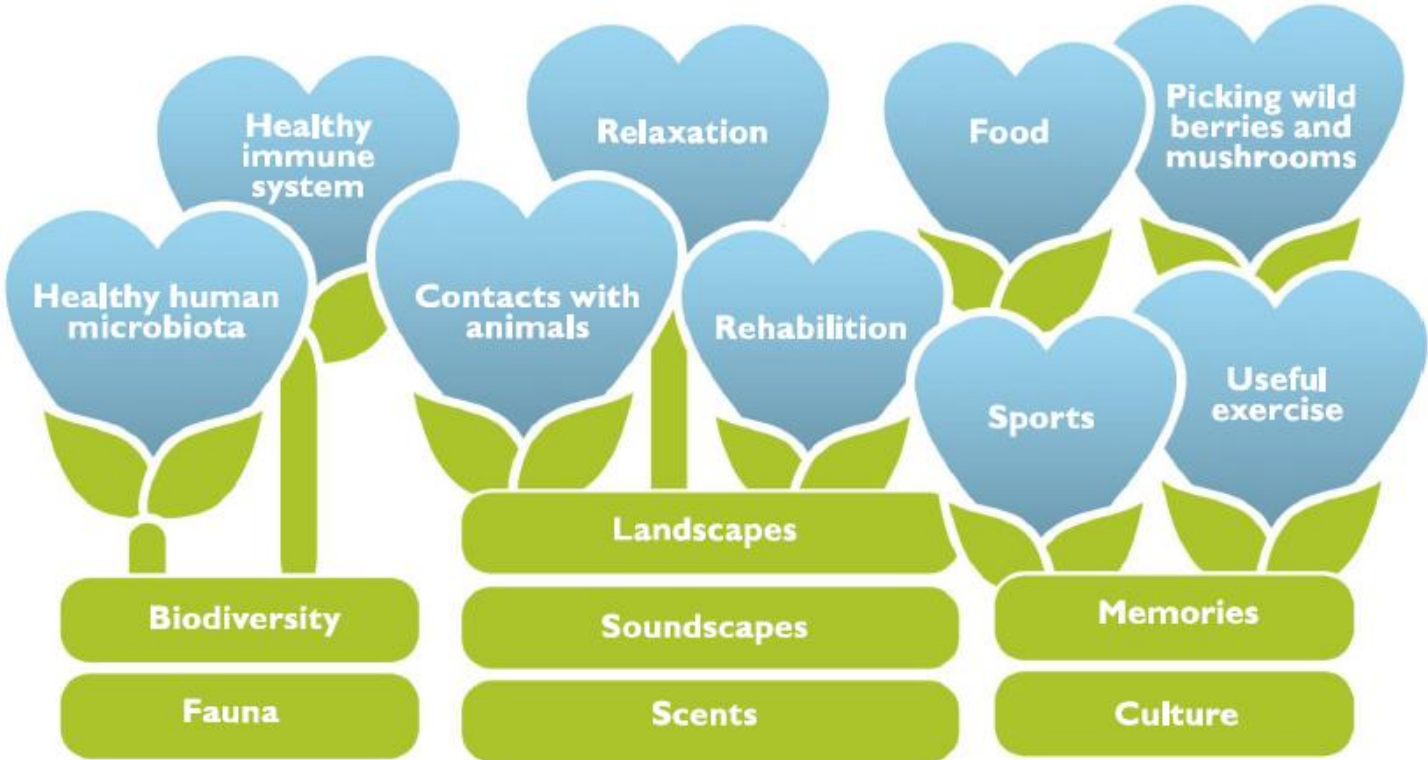
Finnish environment institute SYKE

Conference on the Ecology of Soil Microorganisms

Helsinki 21.6.2018

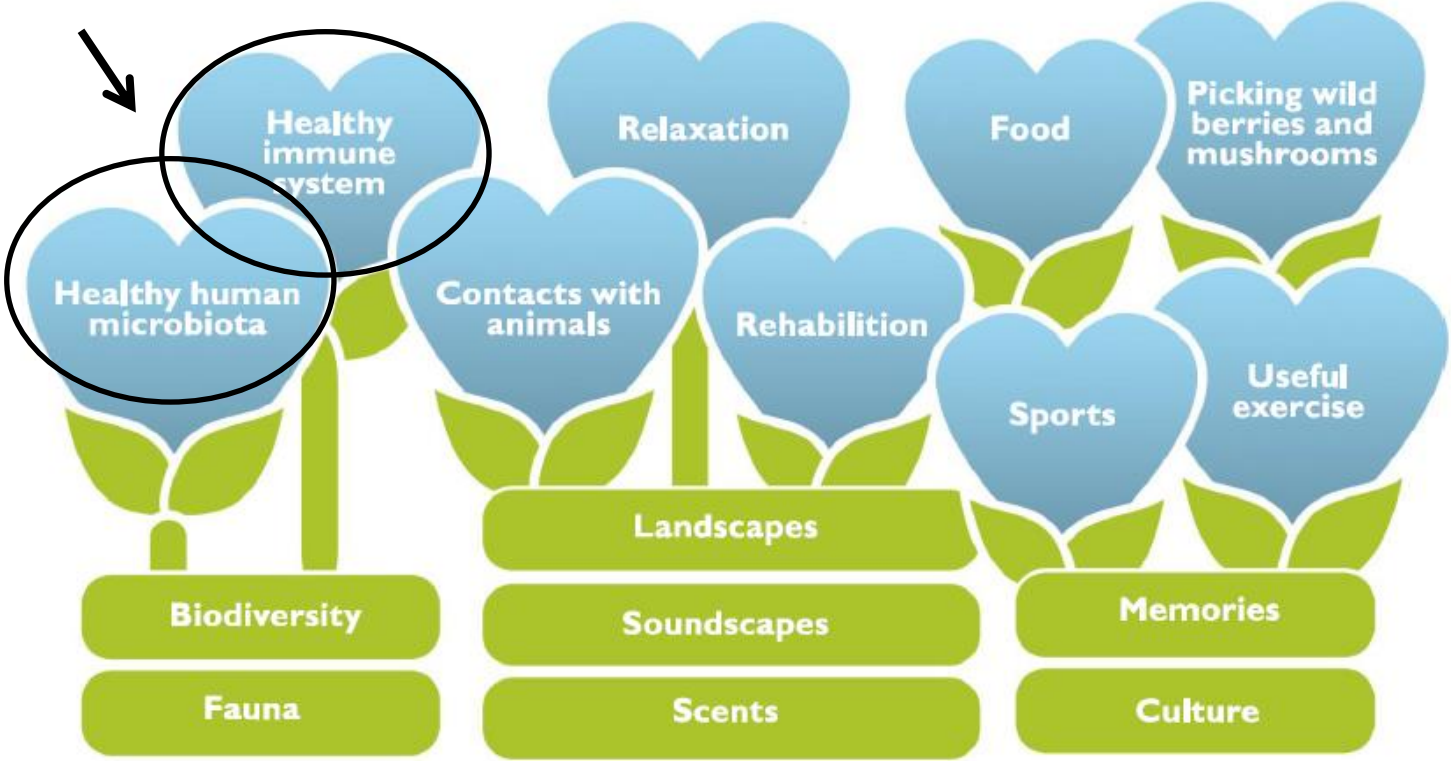


Biodiversity promotes health holistically

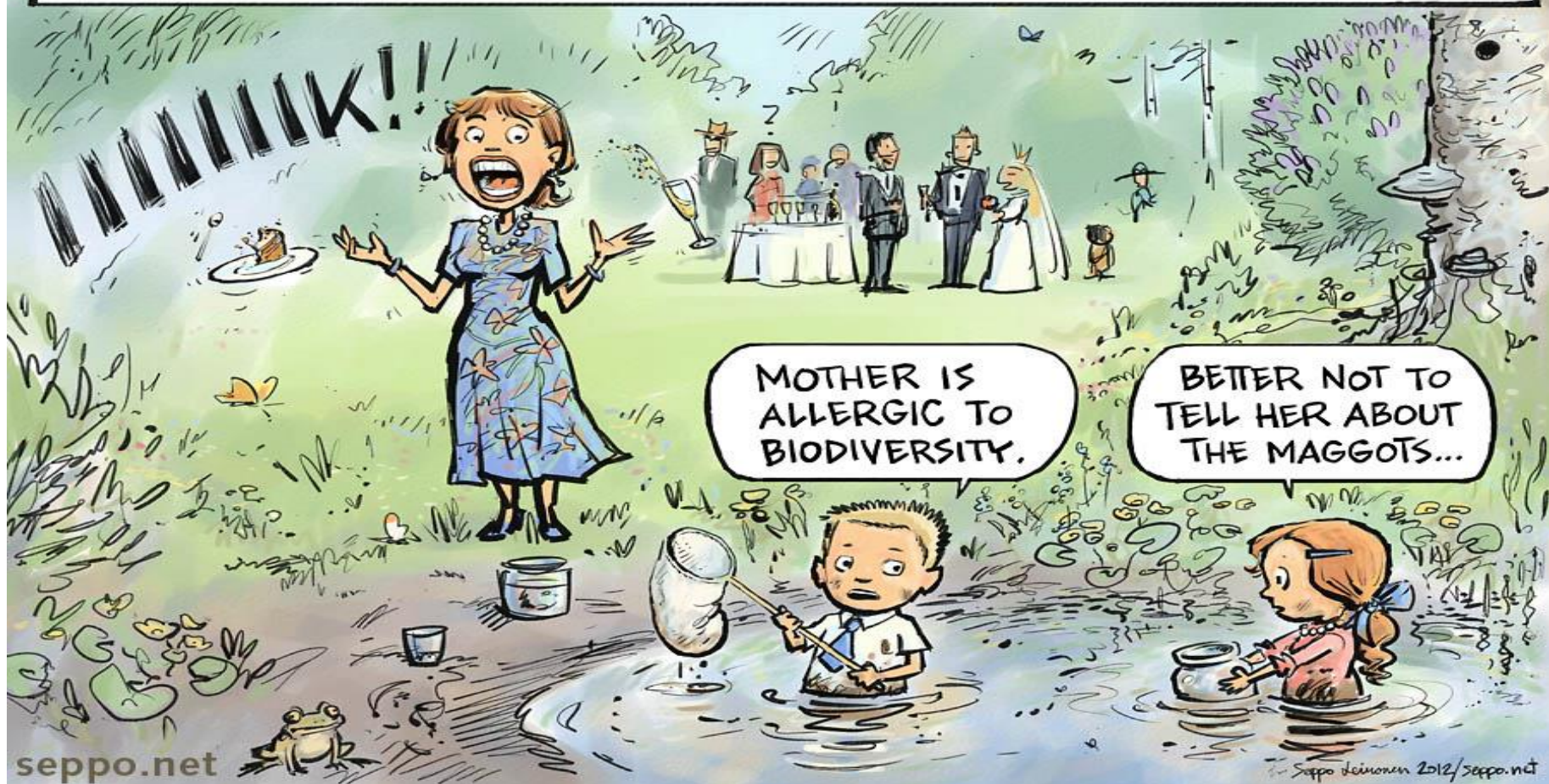


Biodiversity hypothesis of health:

reduced contact with the natural environment and biodiversity may adversely affect the human symbiotic microbiota and its immunomodulatory capacity

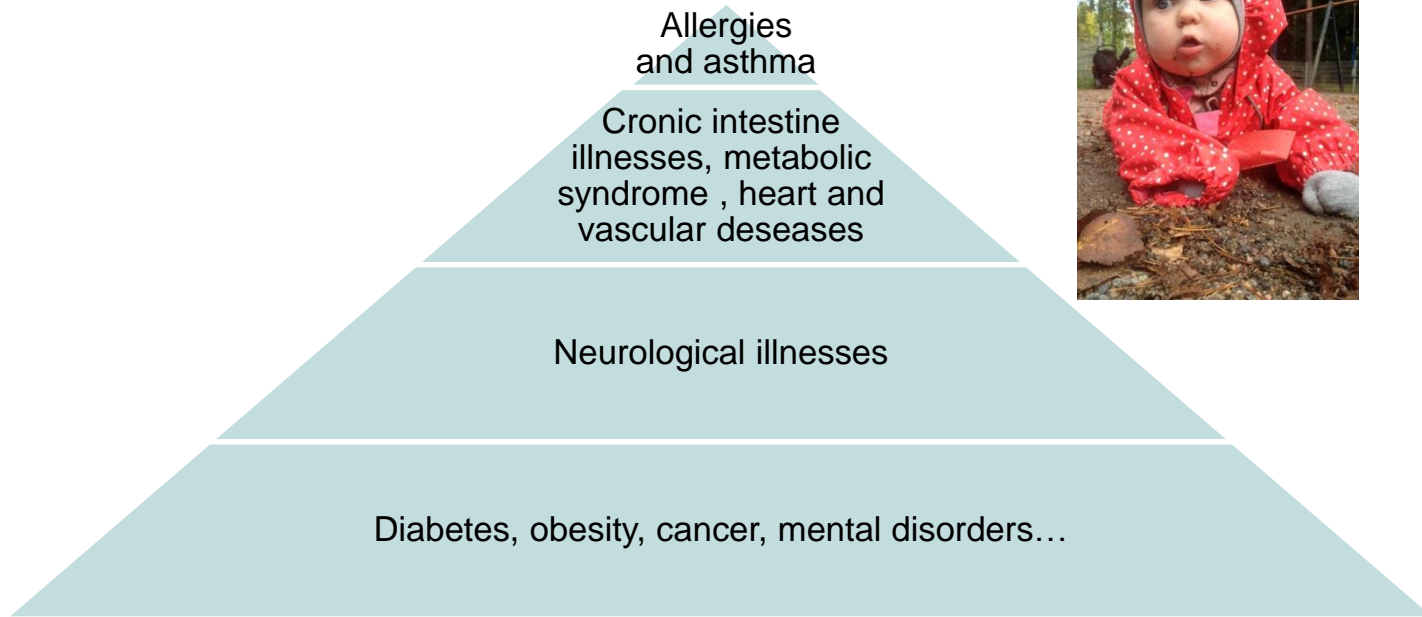


STUDY: BIODIVERSITY LOSS MAY INCREASE ALLERGIES AND ASTHMA.



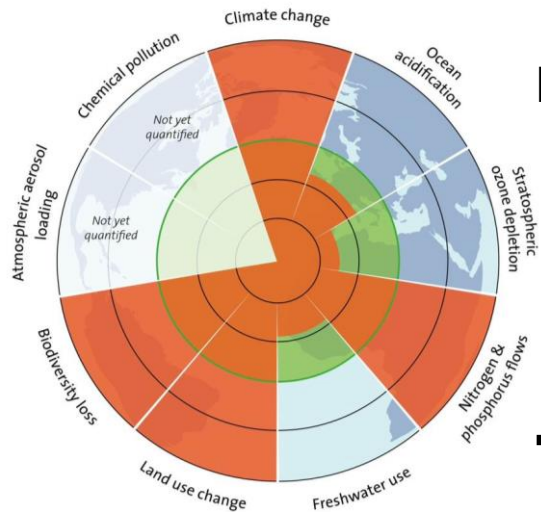


Biodiversity hypothesis: lost contact with environmental microbiota

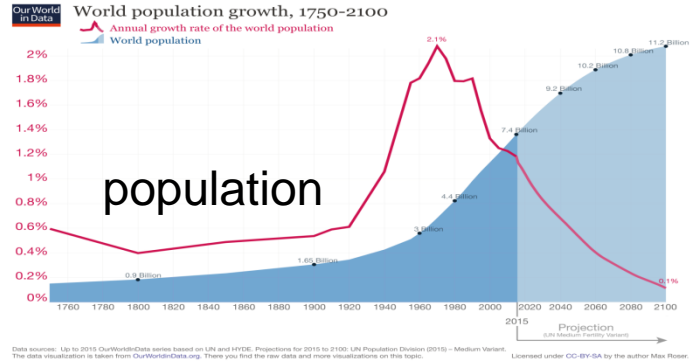


What is the link between biodiversity hypothesis and sustainable development goals?





planetary boundaries

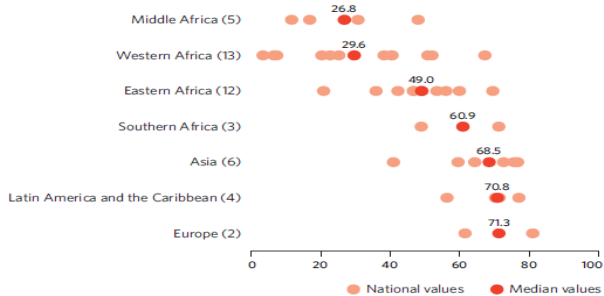


population

The world is not sustainable....

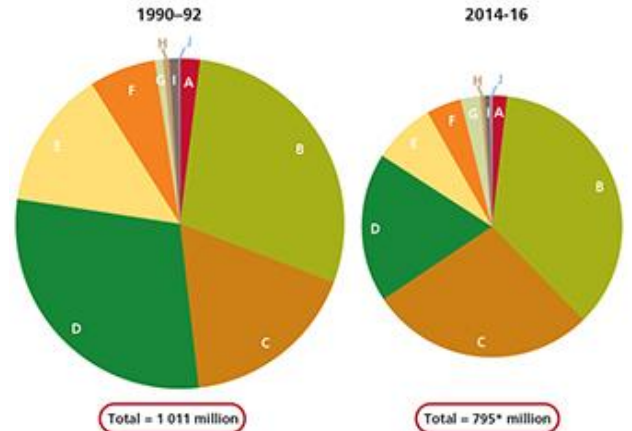
Developed from Rockström et. al 2009 and Steffen et al. 2015

Proportion of women aged 15 to 49 years (married or in union) who make their own informed decisions regarding sexual relations, contraceptive use and health care, 2007-2015 (latest available) (percentage)



Note: The figure reflects available data from 45 countries (covering 7 per cent of the world's population) over the period 2007-2015. The number of countries represented in each region is in parentheses.

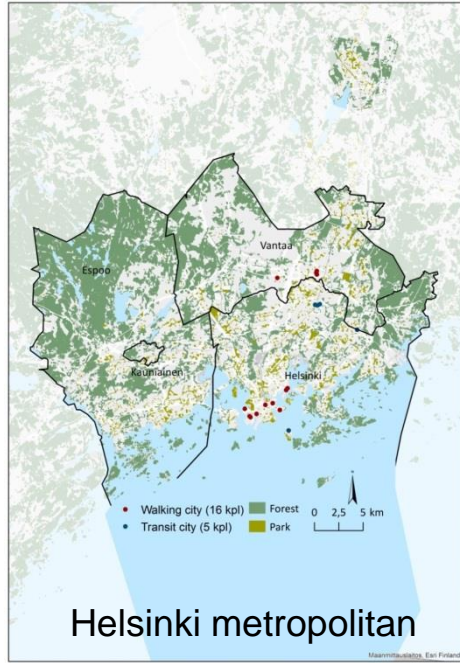
independence of women



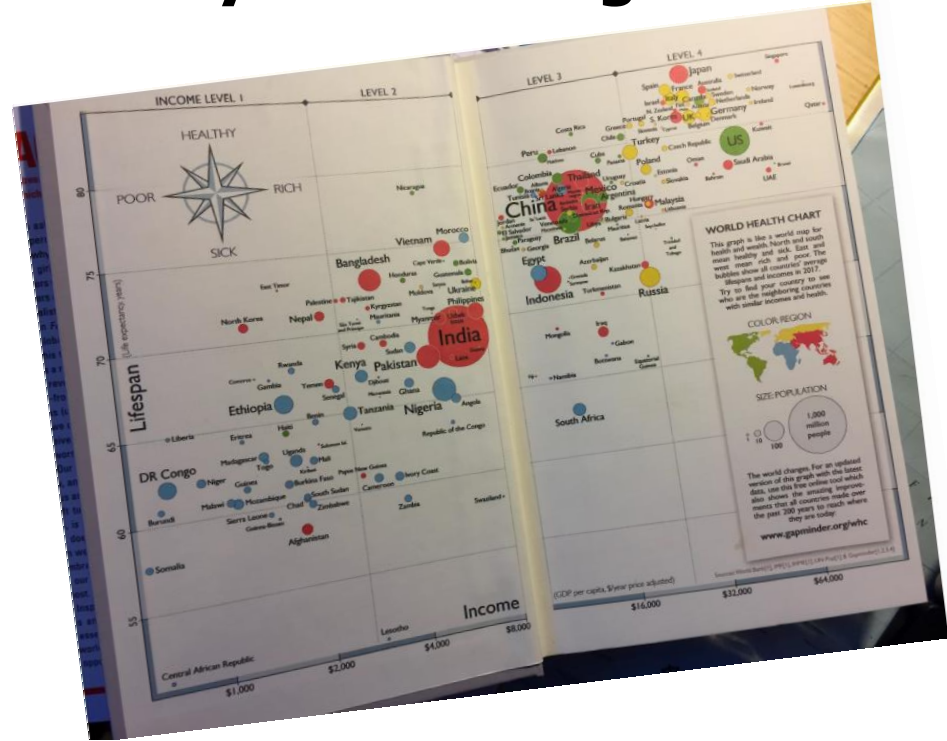
hunger

On the other hand, much good still exists and for many things humanity has made great progress...

Paloniemi, Tiitu & Viinikka SYKE



Green infrastructure in Nordic cities

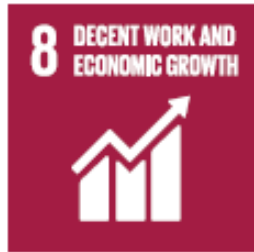


Many countries have made their way from extreme poverty

A close-up photograph of a snail with a brown and tan shell resting on a dark, mossy log in a forest. The background is filled with various types of tree roots and leaves, creating a complex, natural setting. The lighting is soft, highlighting the texture of the snail's shell and the surrounding environment.

If there is not justice for everyone, there is justice for no one

UN Agenda 2030: global sustainable development goals

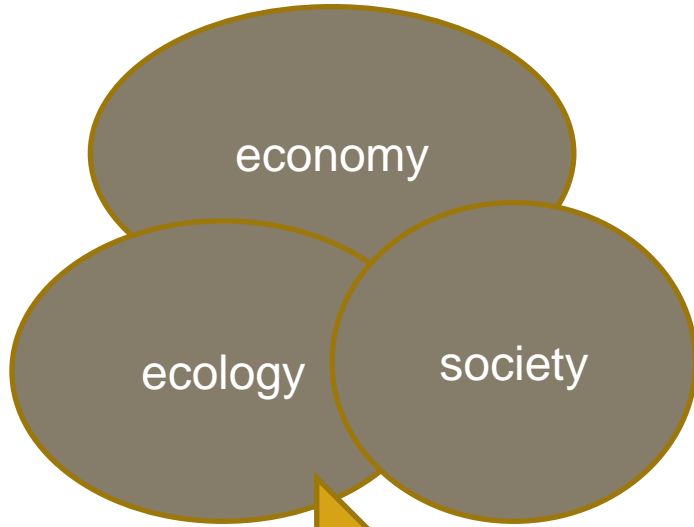


So what is new in the Agenda2030?

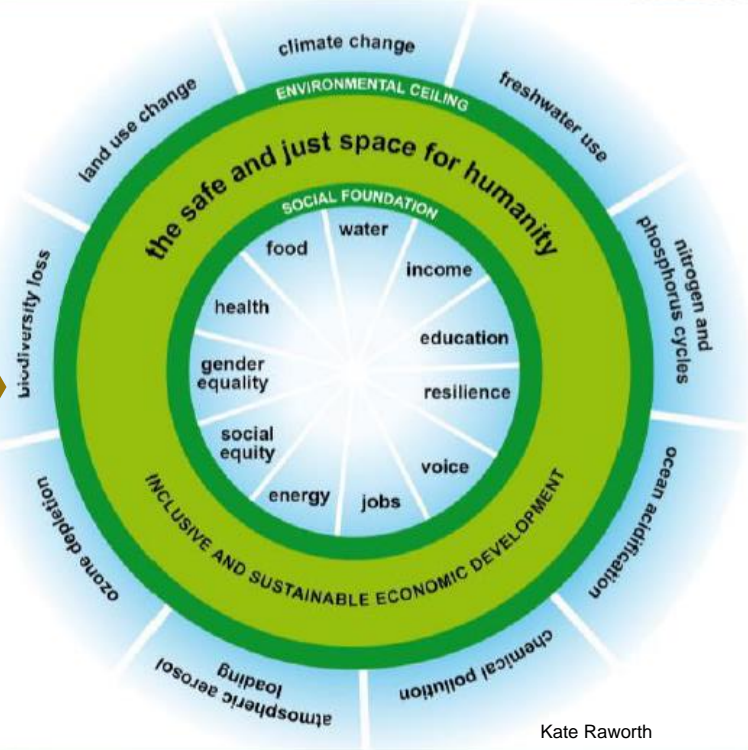
The Secretary-General of the United Nations is the depositary of more than 560 multilateral treaties which cover a broad range of subject matters such as human rights, disarmament and protection of the environment.

Planet Earth and its ecosystems – Partnerships – Mother Earth

Integration



Development

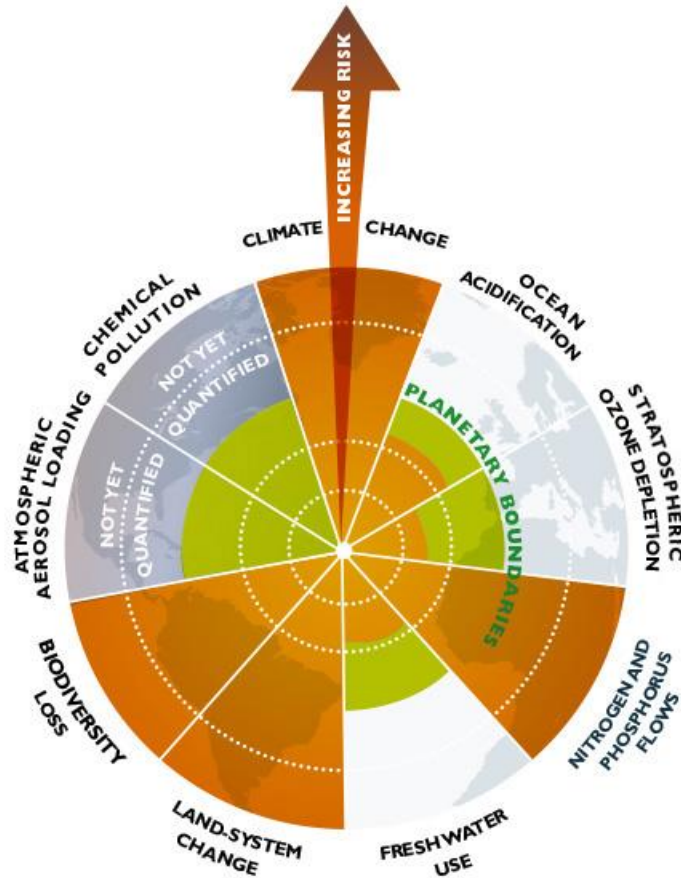


Kate Raworth

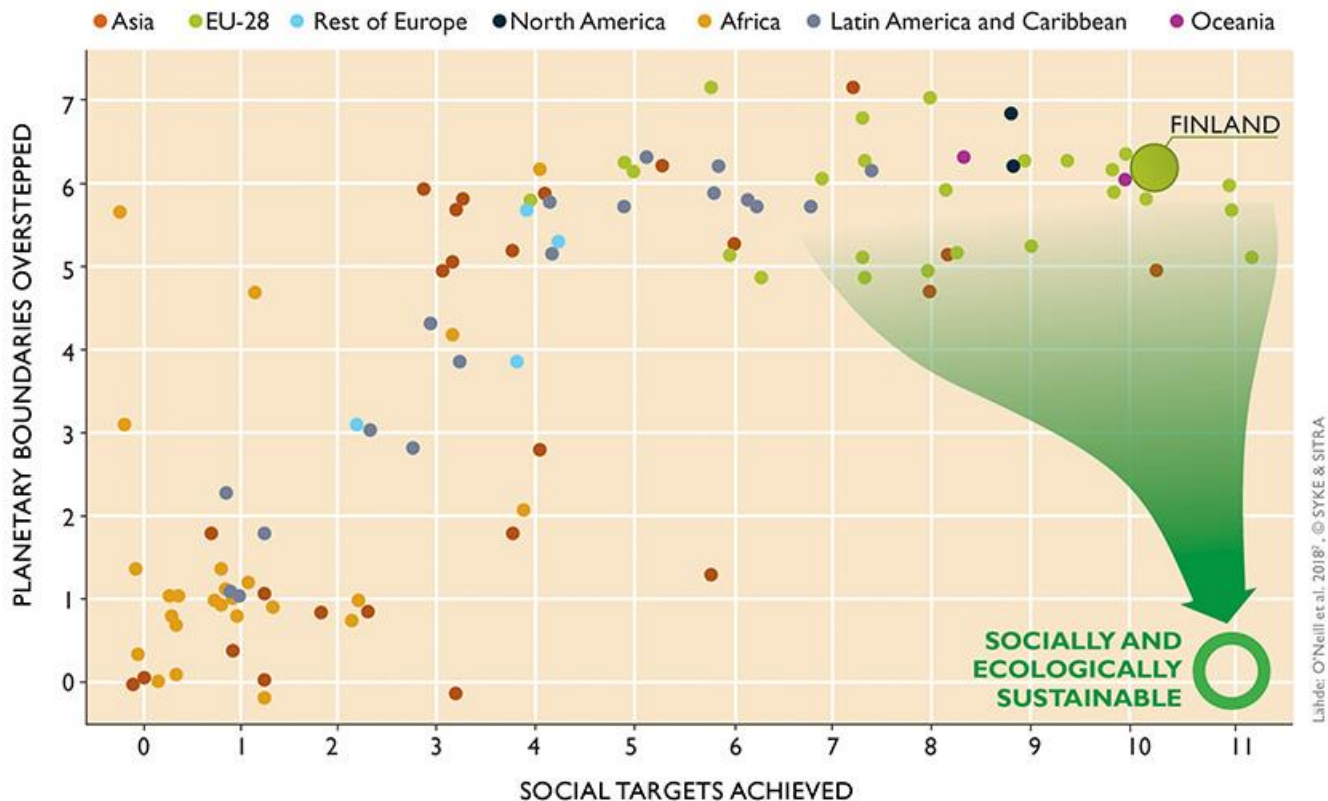
Interaction

All countries commit to act – Universality – No one is left behind

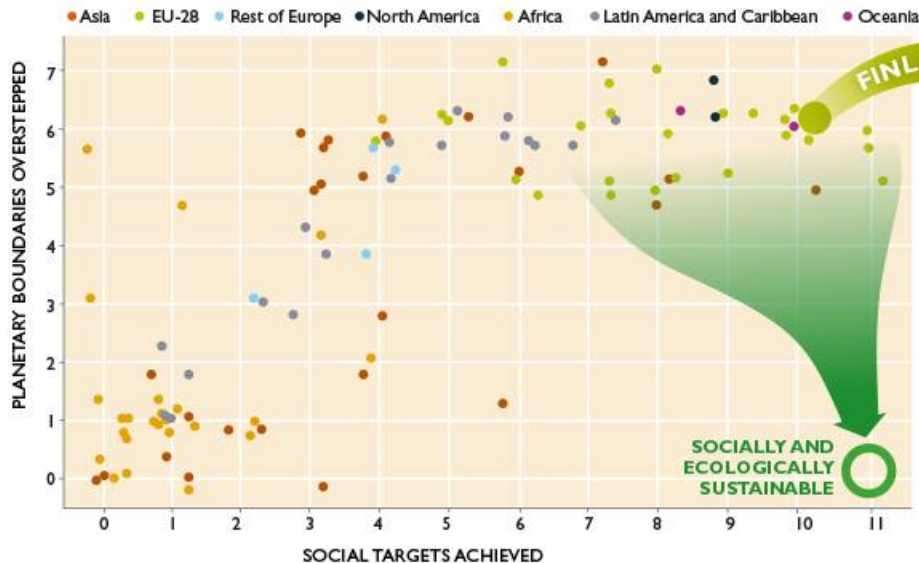
Planetary boundaries are already partly overstepped



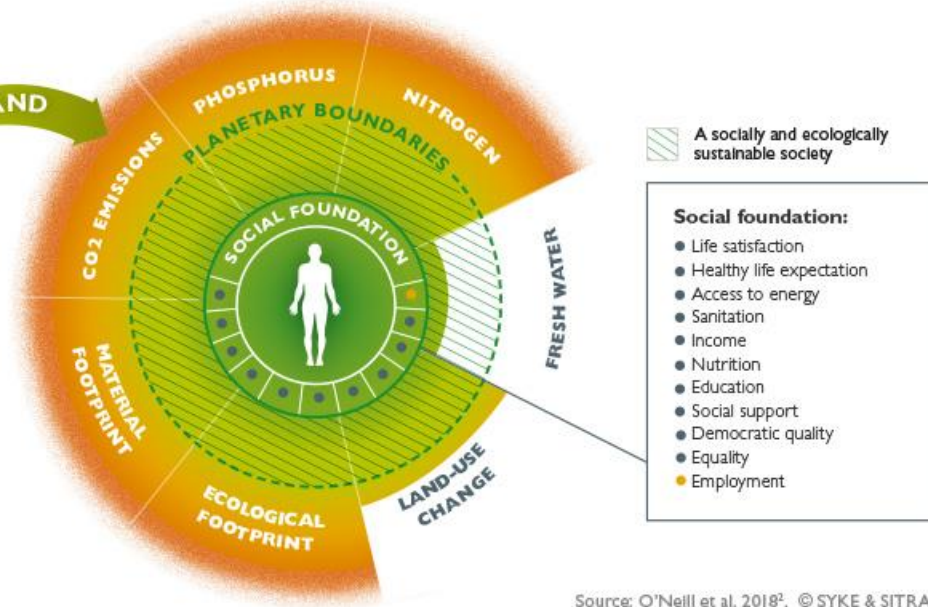
Not a single country has achieved a high level of well-being in an ecologically sustainable way



Not a single country has achieved a high level of well-being in an ecologically sustainable way

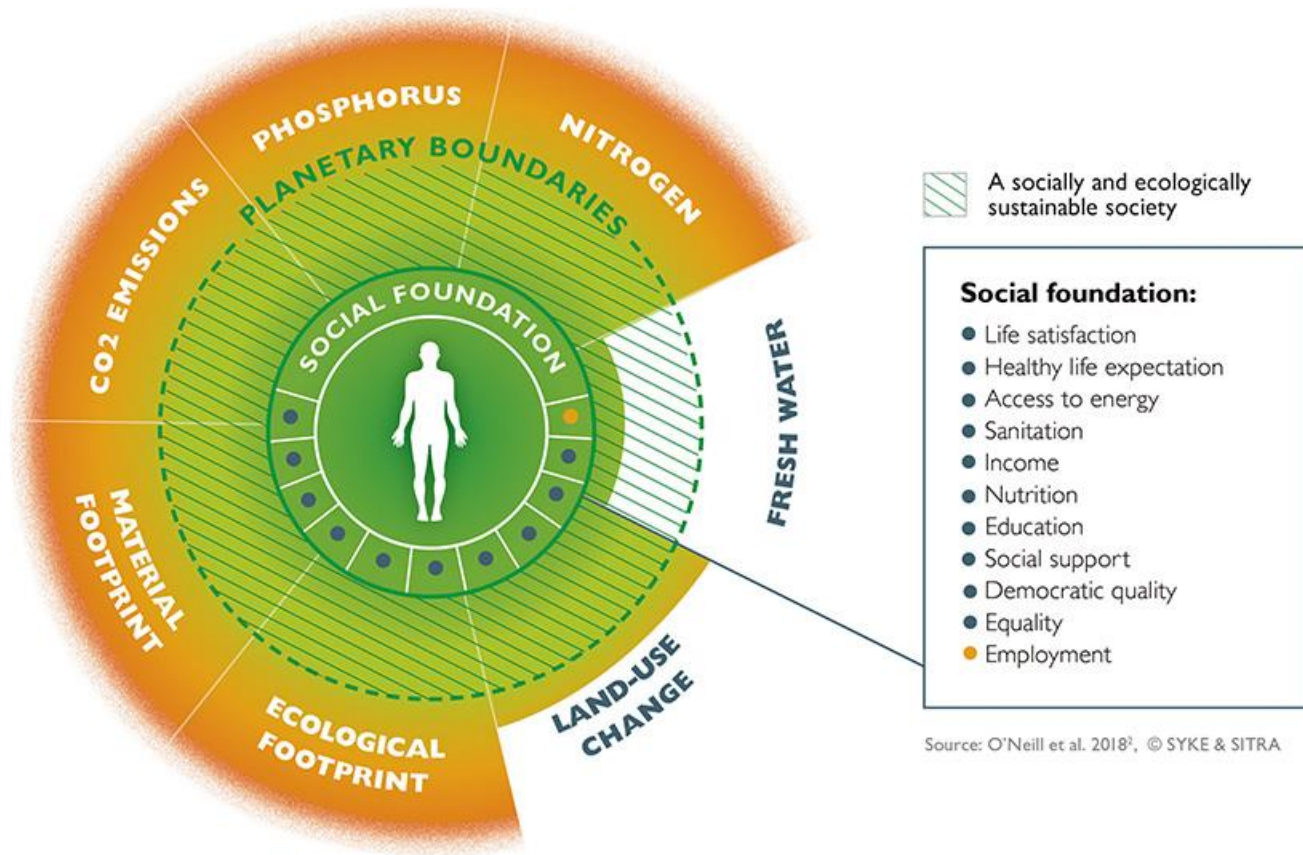


WHICH PLANETARY BOUNDARIES DOES FINLAND OVERSTEP?

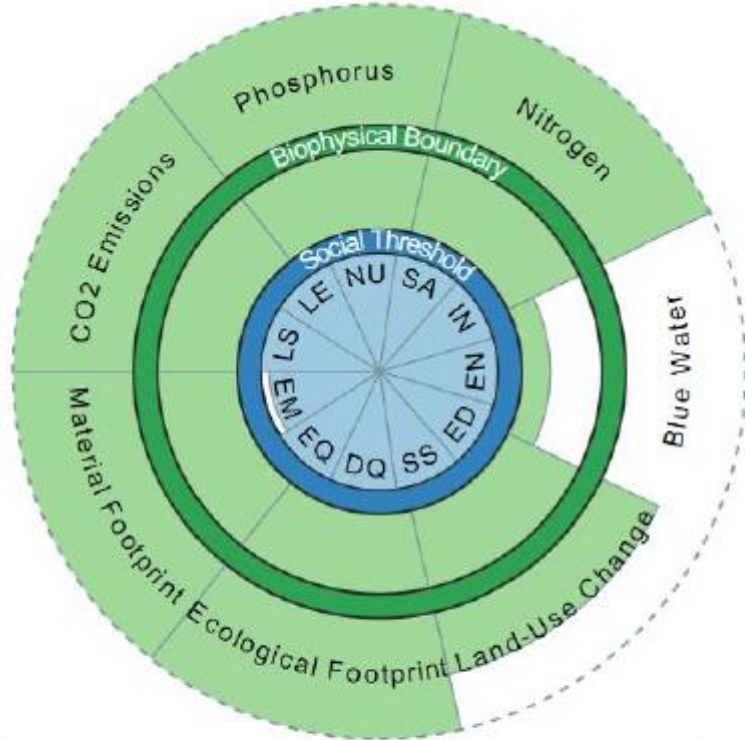


Source: O'Neill et al. 2018², © SYKE & SITRA

Which Planetary Boundaries does Finland overstep?

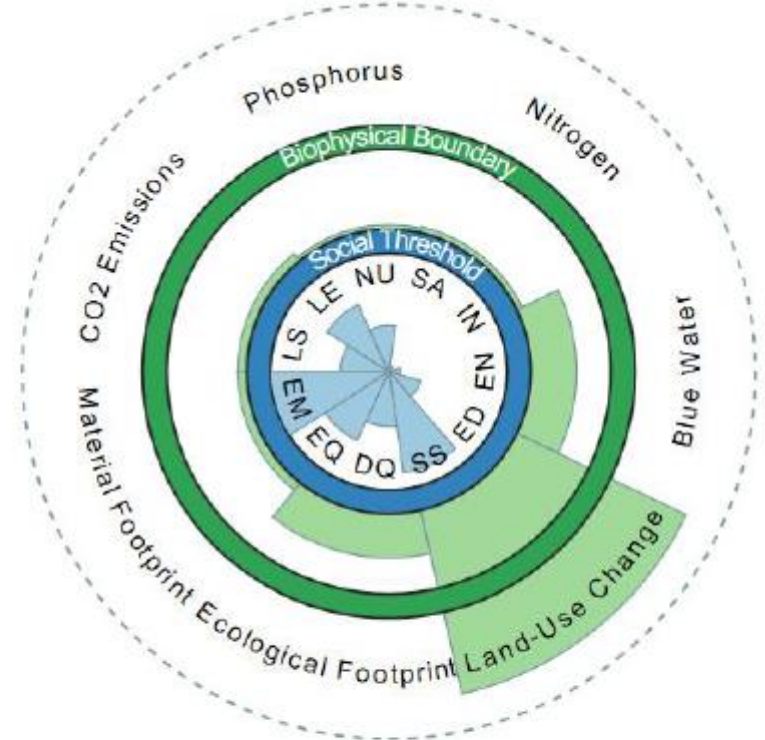


Sweden



- | | |
|------------------------------|-------------------------|
| LS - Life Satisfaction | ED - Education |
| LE - Healthy Life Expectancy | SS - Social Support |
| NU - Nutrition | DQ - Democratic Quality |
| SA - Sanitation | EQ - Equality |
| IN - Income | EM - Employment |
| EN - Access to Energy | |

Madagaskar



**Challenges vary
between countries**

O'Neill et al. (2018) in
Nature Sustainability



Challenge in all countries and regions: implement the SDGs

How to deal eg. with the
interlinkages in practice?

- Policy makers work in silos
 - How to avoid quick and easy matchmaking with the most obvious allies?
- Much of the knowledge on interactions is outdated and wrong
 - How to avoid the use of preconceptions?



**TRANSFORMATIONS – WAYS TO
TACKLE ARISING PHENOMENA**

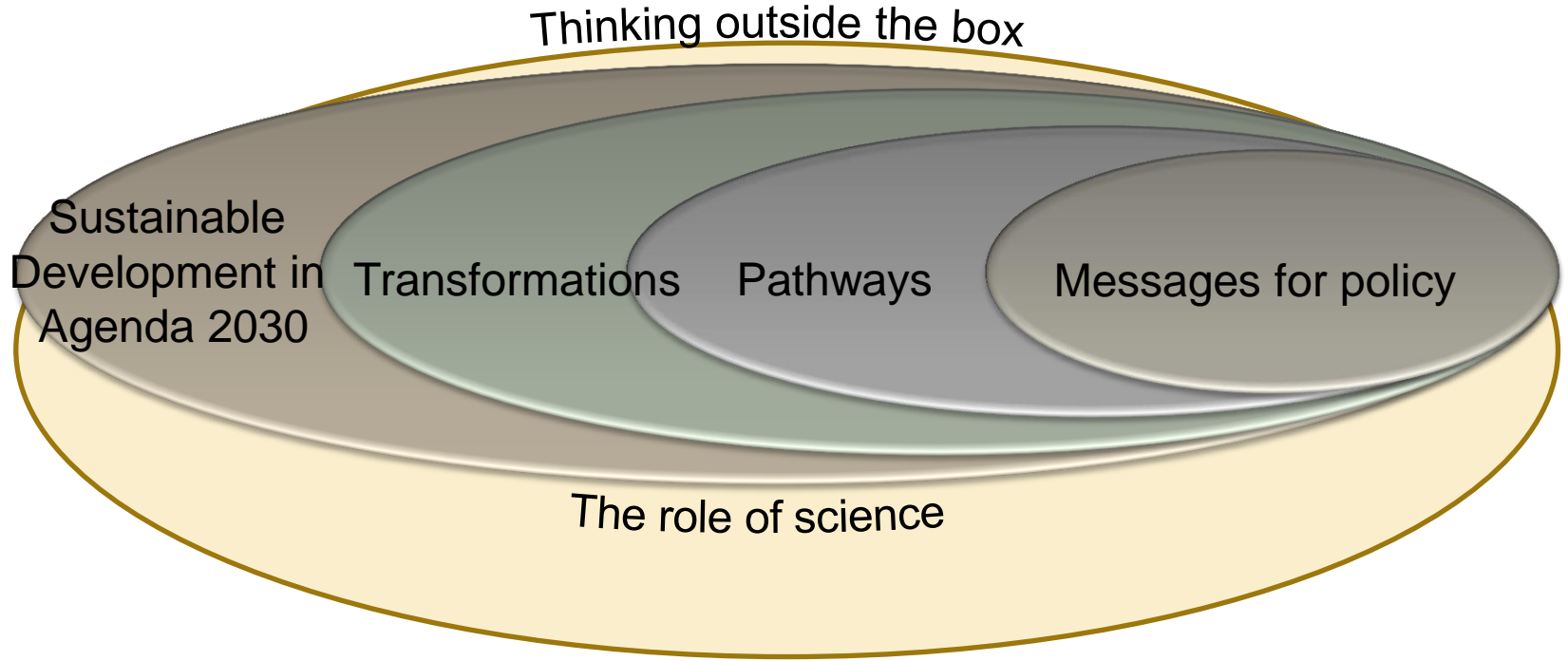


**AGENDA2030 – A
VISION FOR
HUMANITY IN THE
ANTHROPOCENE**

**KNOWLEDGE
– SCIENCE
AND BEYOND**



UN Global sustainable development report 2019



Transformations for solutions

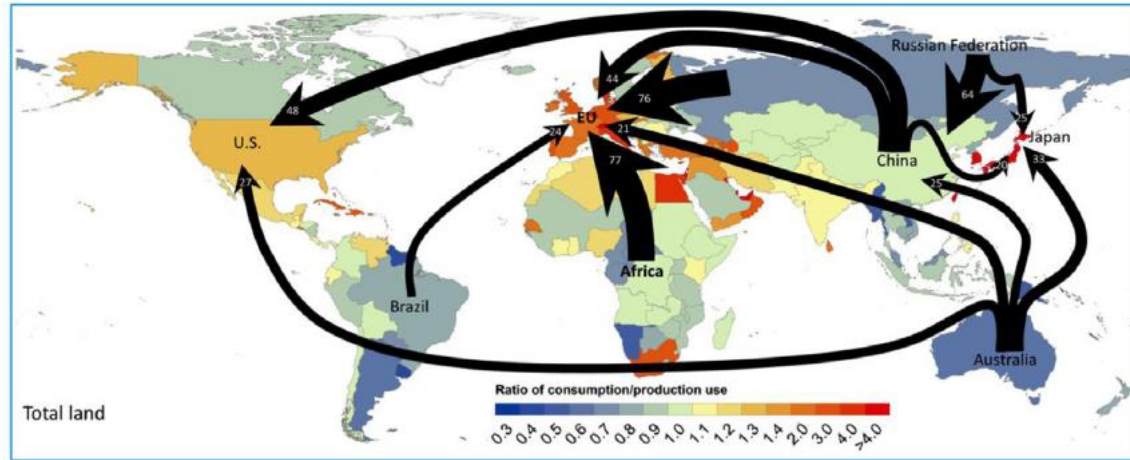


Innovative mechanisms are needed in bilateral and global governance

- Decide together on the use of the commons such as natural capital (co-management)
- Refugees, epidemics, shared rivers, climate, arctic...



Multilevel and global rules for dealing with flows



Yu et al. 2013

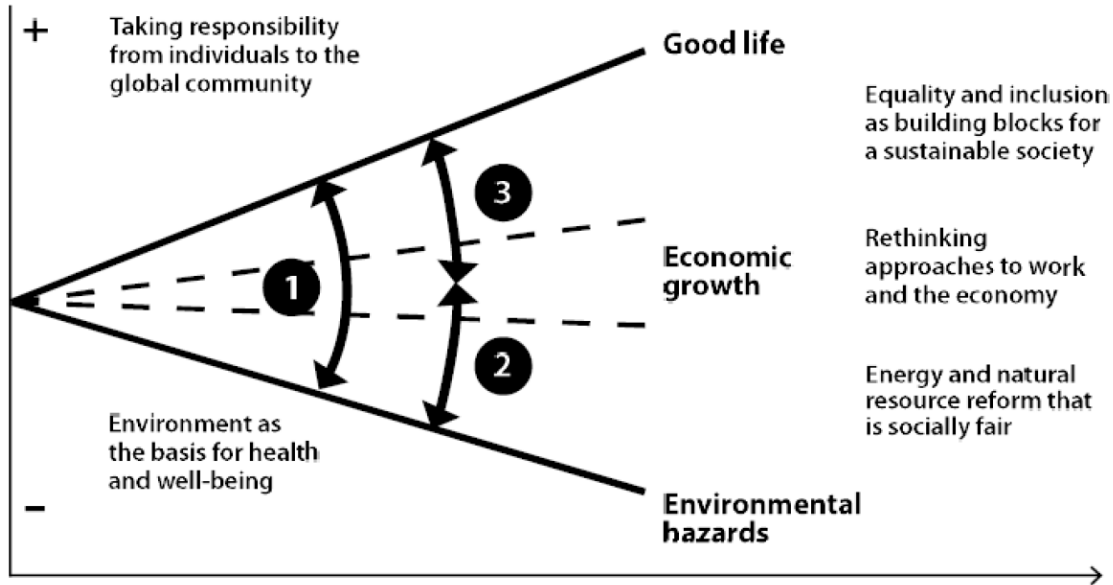
- Present action is unjust and distorts national strategies for striving towards sustainable development
- Environmental impacts arise in both ends of the flows, and in different pace

Joint efforts needed by the business and public sector, and civil society

-> companies can play a leading role in changing practices!

Mainstreaming sustainable development in national policy framework

Key focus areas of sustainable development



Action on local level

- Plenty of potential for radical innovations when encouraged and rewarded
- Joint governance and joint rules for local level
- Experiments, their evaluation and potentially dispersal
- Moving from participation to joint experimentation, acting in groups, learning in groups, changing routines in groups
- Businesses can act as engines for changes in practice



Effective paths towards sustainable development

- food • water • oceans • ecosystem services
- cities • energy • health • education • epidemics • labour • climate change • land use



So! What is the link between biodiversity hypothesis and sustainable development goals?





Biodiversity hypothesis: microbiota connection cut through urbanisation and modern lifestyles



Reduction of communicable and non-communicable diseases

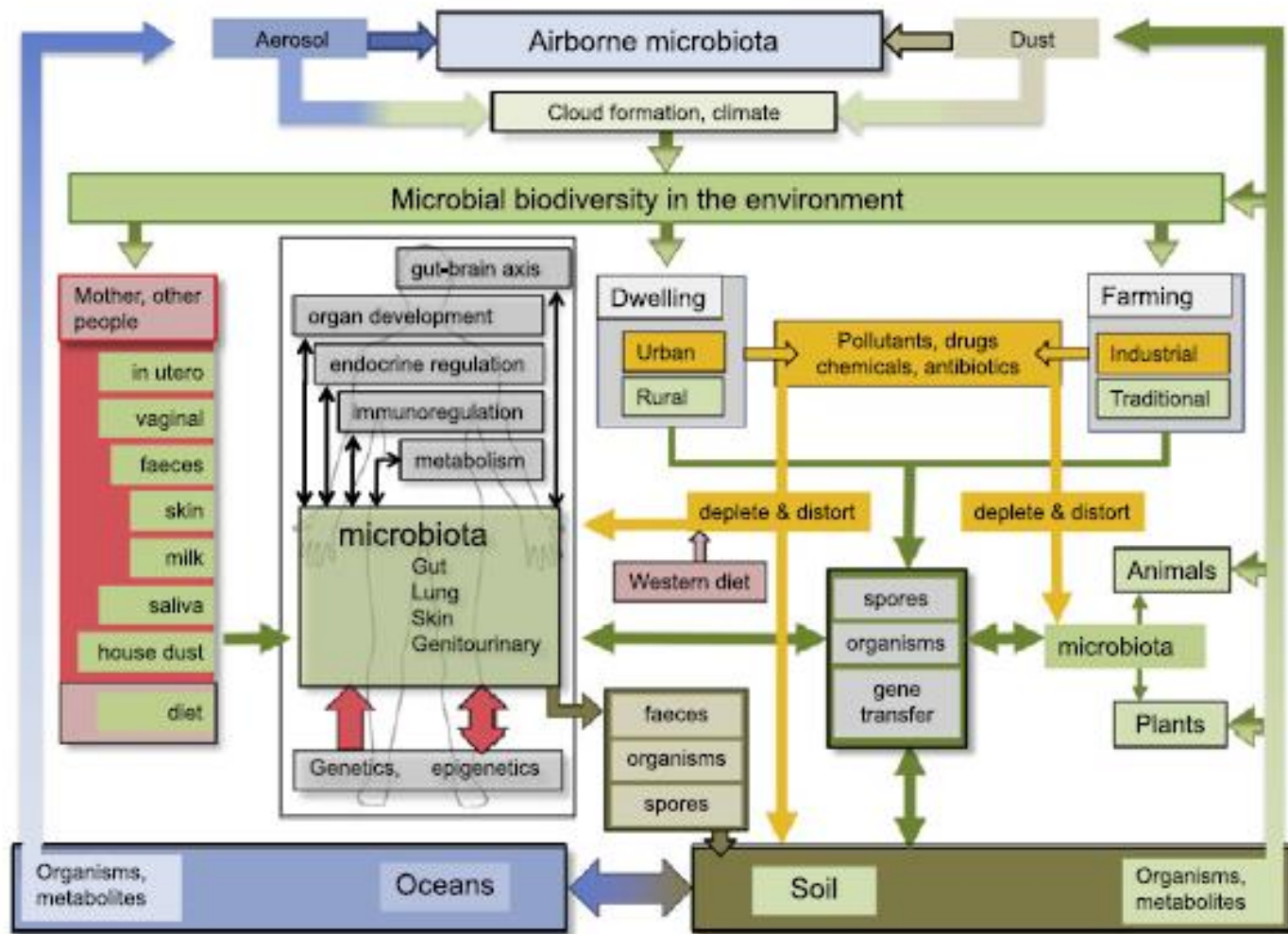
Allergies and asthma

Chronic intestine illnesses, metabolic syndrome, heart and vascular diseases

Neurological illnesses

Diabetes, obesity, cancer, mental disorders...

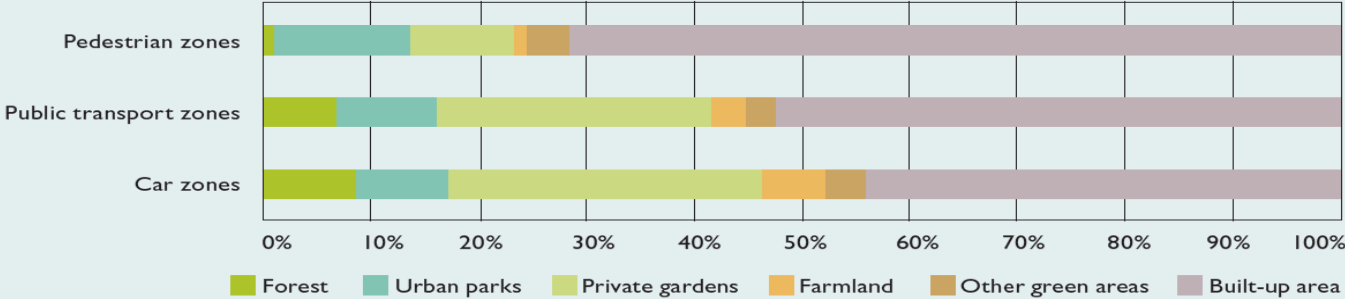




Flandroy et al. 2018

Biodiversity hypothesis: green infrastructure and enabling practices

Natural environments near kindergartens in different urban zones



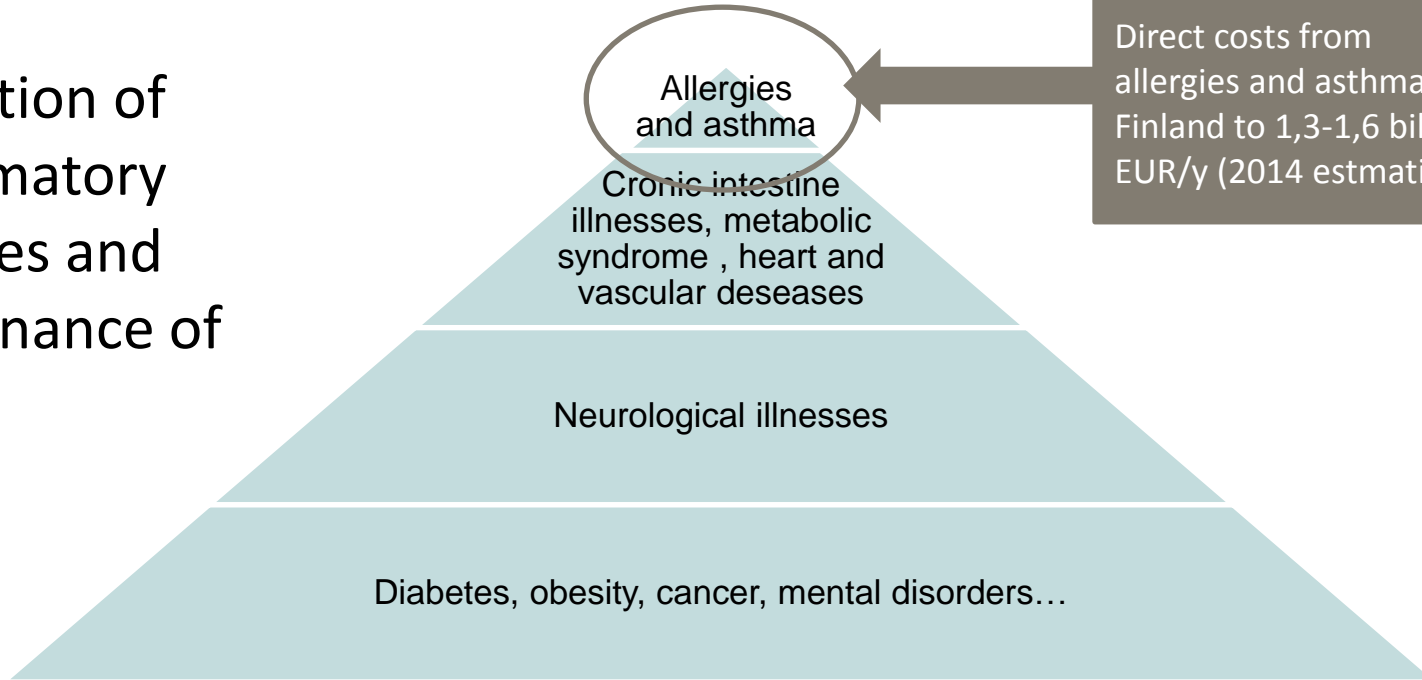
SYKE | Urban zones: SYKE/YKR | Kindergartens: cities of Helsinki, Vantaa, Espoo and Kauniainen | Land cover: Urban Atlas 2012 / EEA





Biodiversity hypothesis: urbanisation and modern lifestyles

Prevention of inflammatory diseases and maintenance of health



Direct costs from allergies and asthma in Finland to 1,3-1,6 billion EUR/y (2014 estimation)

Direct link

- SDG2 Hunger, food security and improved nutrition and sustainable agriculture
- SDG6 Ensure availability and sustainable management of water for all
- SDG11 Make cities and human settlements inclusive, safe, resilient and sustainable
- SDG 14 Conserve and sustainably use the oceans, seas, marine resources for sustainable development
- SDG15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably use forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Indirect link through other SDGs

- SDG1 End poverty
- SDG8 Promote sustained, inclusive and sustainable economic growth and decent work for all
- SDG9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
- SDG10 Reduce inequality within and among countries
- SDG 13 Take urgent action to combat climate change and its impacts

Help in materialising the actions

- SDG4 Ensure inclusive and equitable education and promote lifelong learning opportunities for all
- SDG17 Strengthen the means of implementation and revitalize the global partnership for sustainable development

Interlinkages

- SDG5 Achieve gender equality and empower all women and girls
- SDG10 Reduce inequality within and among countries
- SDG16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels



Implementing in practice:

Planning healthy environments (infrastructure + enabling contact) requires collaboration across administrative sectors on local level and motivation from citizens and businesses

- Planning
- Recreation
- Sports
- Green area management
- Building
- Environment
- Health
- Education



***You are part of the
puzzle...***

***where do you see
your role in building
pathways towards
sustainable
development?***



S Y K E