

**Science and PPP for green  
development of Mongolia:  
Sustainability and transformation of  
pastoral social-ecological systems**

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# Content

- Introduction
  - Sustainability and SD
  - RIO+20: SDGs, green economy and climate change
  - Sustainable Development Index for the post 15 agenda
  - Transformation towards sustainability: Science, traditional knowledge, technology, PPP & LCDP
- Concept of Green Development of Mongolia, approved by the Parliament of Mongolia, June 13, 2014
- Sustainability and Transformation Pastoral Social-Ecological System in Mongolia

# Interconnectedness of global, national and local sustainability

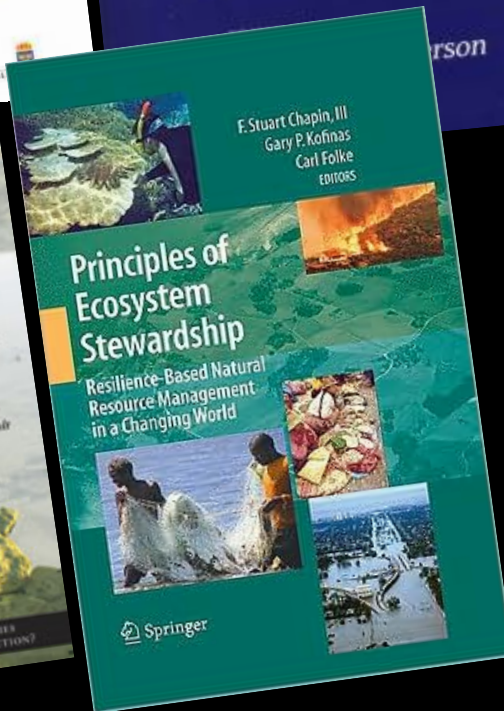
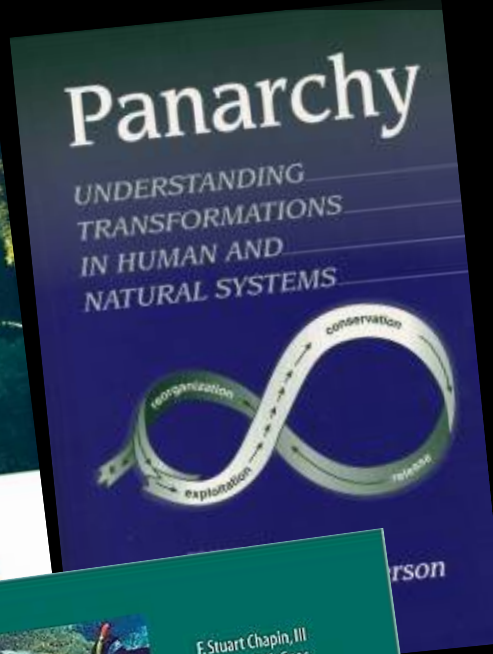
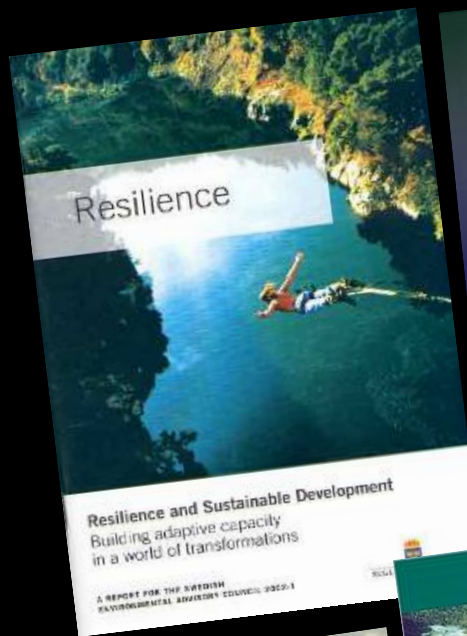


- 3 pillars of Sustainable Development
- Resilience to cope with uncertainties of dynamic world
- Adaptation to critical slow variables such as global warming

# Features of Sustainability



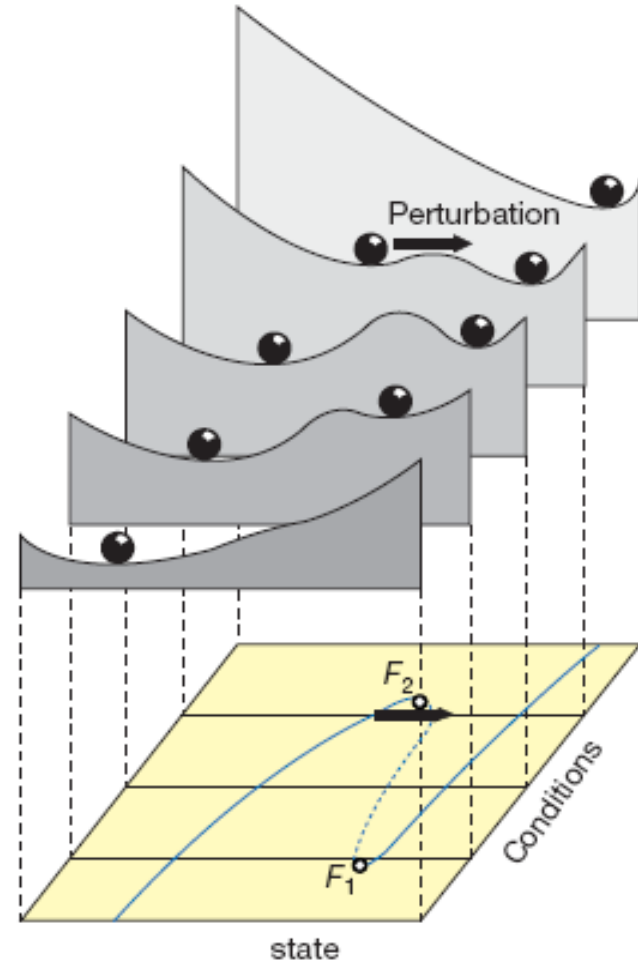
# Resilience – Three features



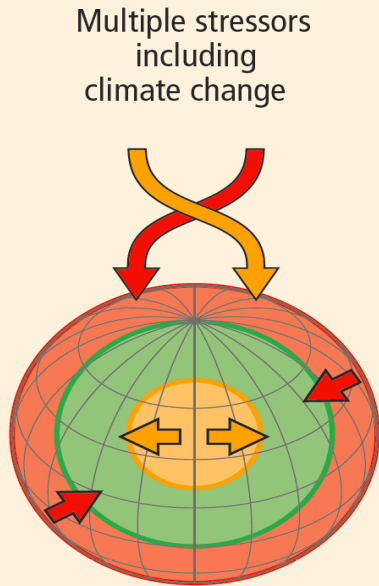
1. **PERSISTENCE** in the face of change, buffer capacity, withstand shocks
2. **ADAPTABILITY** the capacity of people in a social-ecological system to manage resilience e.g. through collective action
3. **TRANSFORMABILITY** the capacity of people in a social-ecological system to create a new system when ecological, political, social or economic conditions make the existing system untenable

# Transitions and regime shifts

Regime Shifts DataBase  
Large persistent changes in ecosystem services

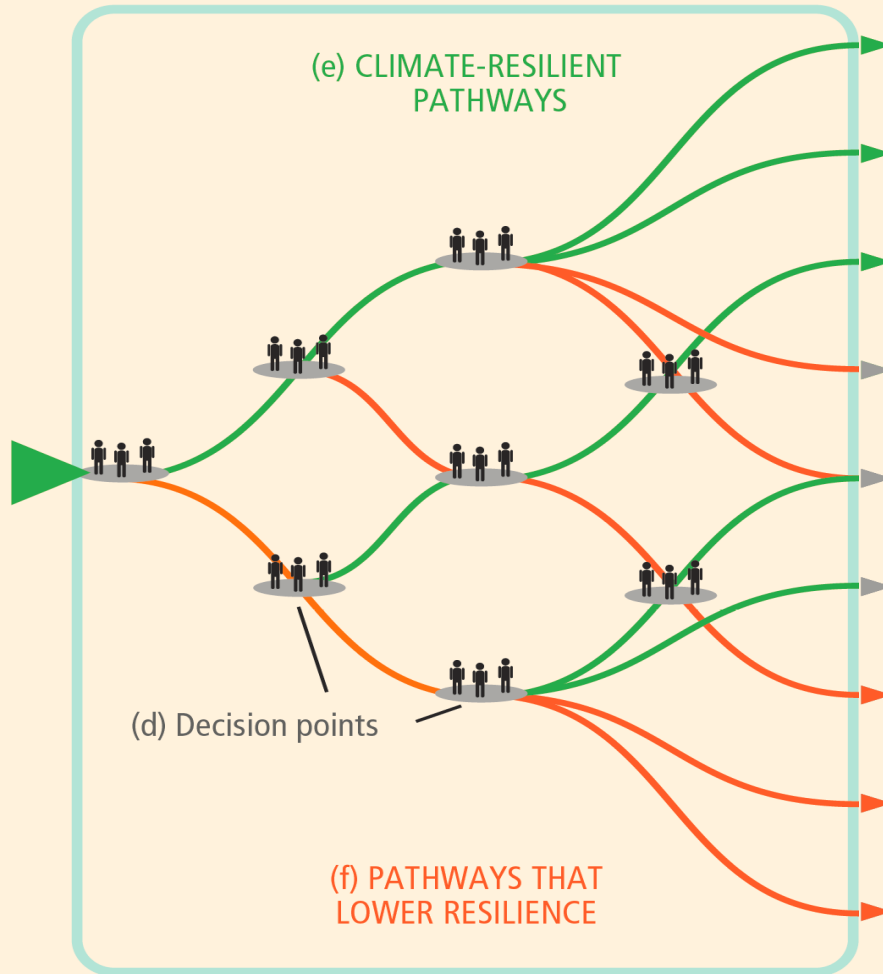


(a) Our world

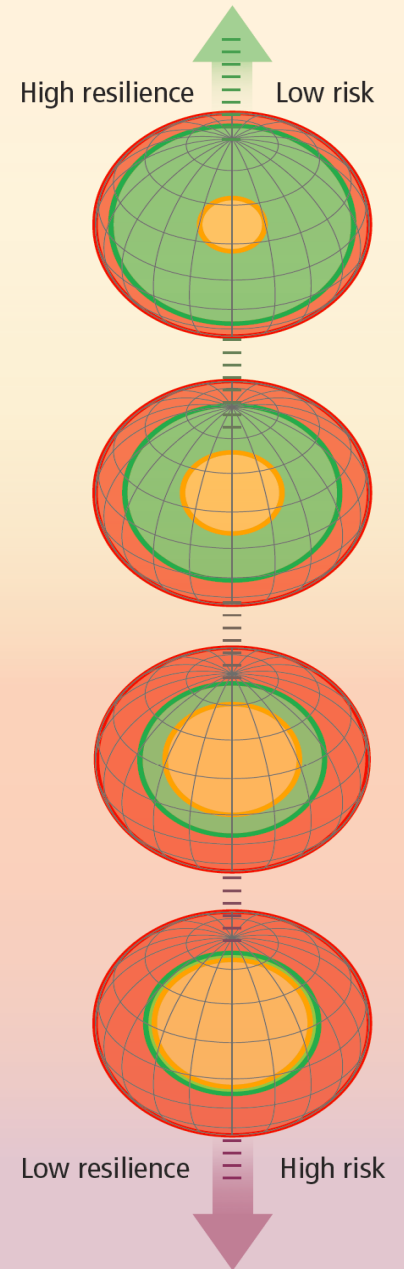


- Biophysical stressors
- Resilience space
- Social stressors

(b) Opportunity space



(c) Possible futures





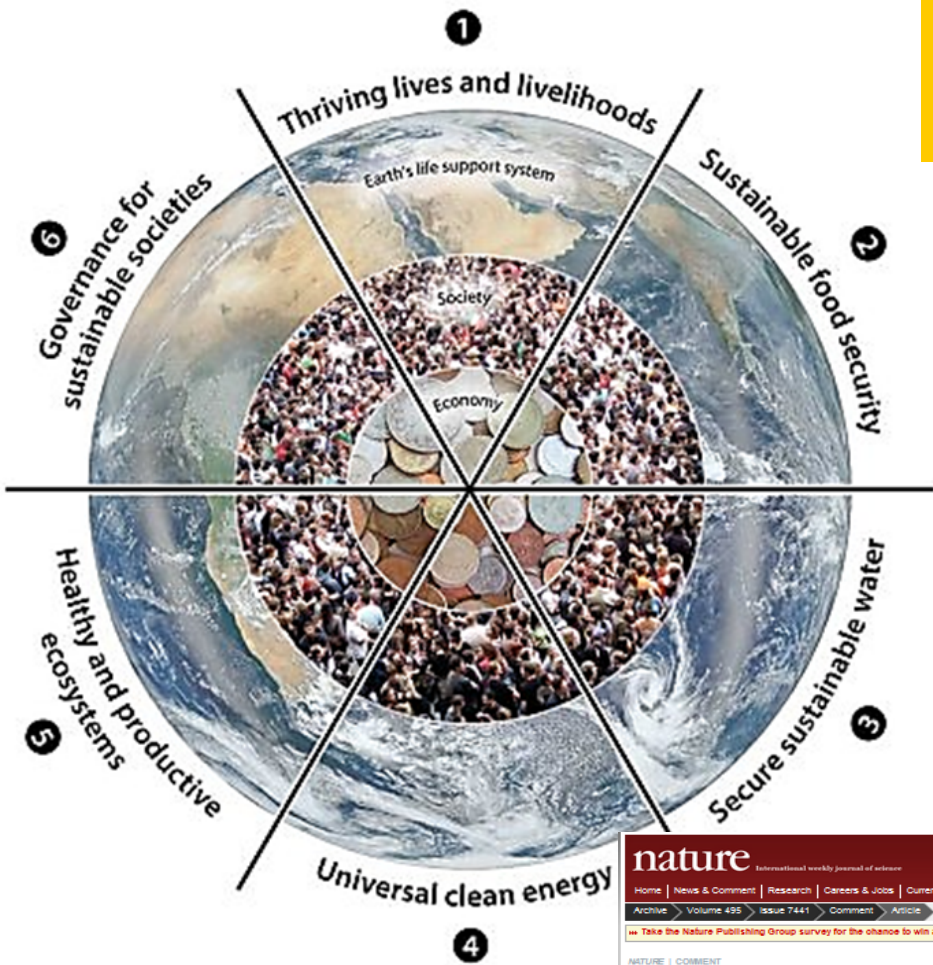


# RIO+20

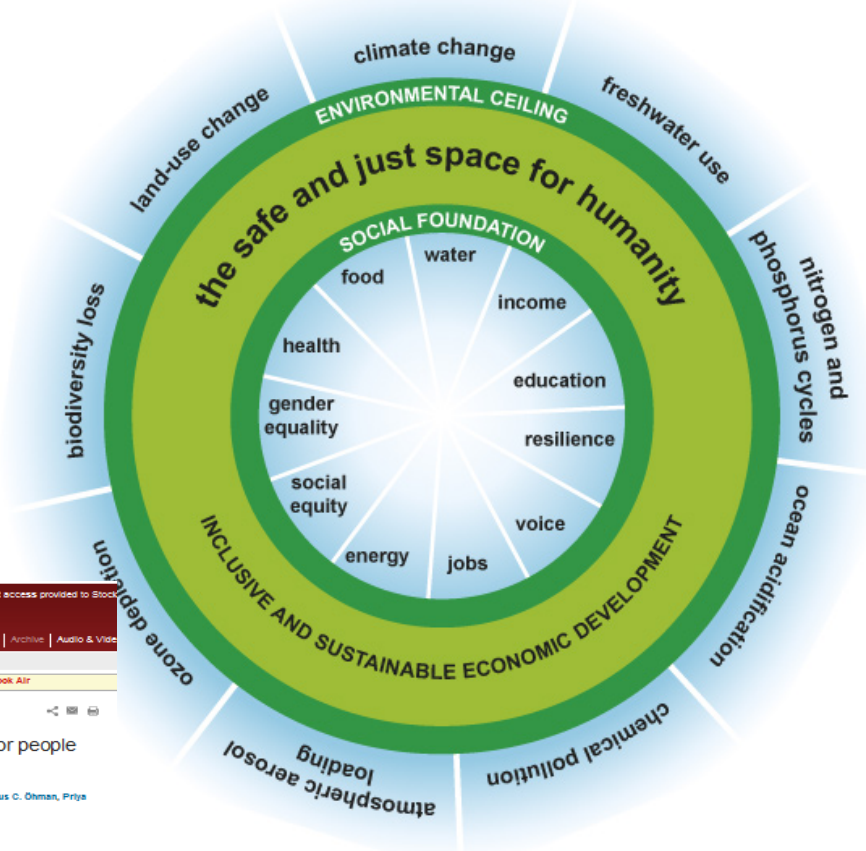
## *the future we want*

- ***Sustainable Development Goals in post-2015***
- ***Green economy - a new tool for sustainable development and poverty eradication***
- ***Climate change - newly emerged challenge***
- ***Governance for sustainable development***

“SDGs must genuinely add up to sustainability”  
(Stafford, 2013)



The safe and just space for humanity



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NATURE | COMMENT

Policy: Sustainable development goals for people and planet

David Griggs, Mark Stafford-Smith, Owen Gaffney, Johan Rookström, Marous C. Ötman, Priya Sthamander, Willi Steffen, Gisbert Glasser, Noriohika Kanie & Ian Noble

Affiliations | Corresponding author

Nature 496, 305–307 (21 March 2013) | doi:10.1038/495305a

Published online 20 March 2013

Full text access provided to Stockholm University

Planetary stability must be integrated with United Nations targets to fight poverty and secure human well-being, argue David Griggs and colleagues.



# SDG's for People & Planet

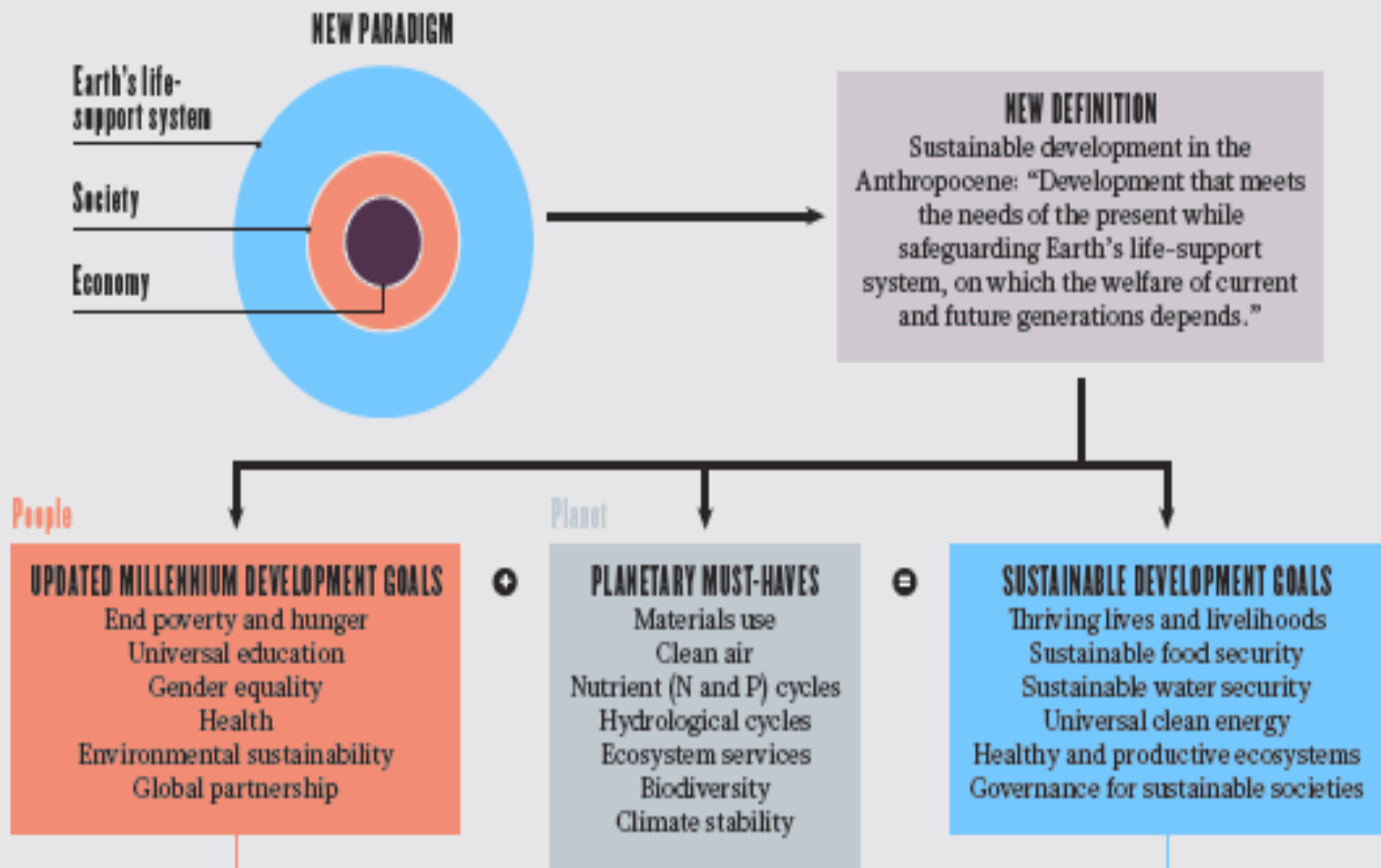
2011).

www.pbl.nl

Planetary boundaries – safe operating space for humanity  
“Donut” model – the safe and just space for humanity

# A UNIFIED FRAMEWORK

A set of six sustainable development goals (SDGs) follow from combining the Millennium Development Goals (MDGs) with conditions necessary to assure the stability of Earth's systems.

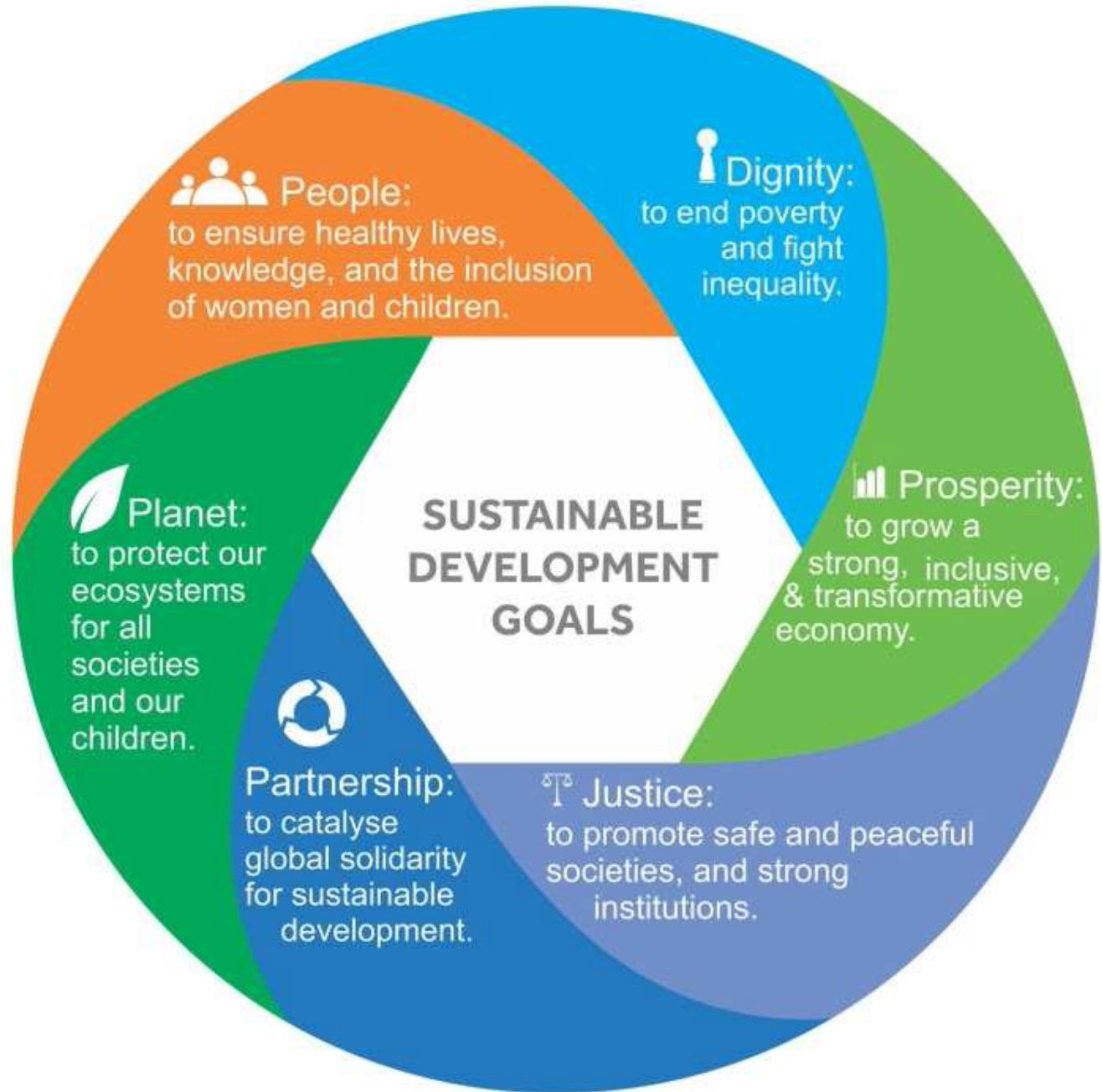


The Road to  
Dignity by 2030:  
Ending Poverty,  
Transforming  
All Lives and  
Protecting the  
Planet

*Synthesis Report  
of the Secretary-  
General*

*On the Post-2015  
Agenda*

*Dec 4, 2014*



Expert group meeting on macroeconomic prospects, policy challenges and sustainable development in Asia-Pacific, 2-4 December 2014, Bangkok, Thailand

# Partnership for Prosperity of People, and the Planet (PPPP)

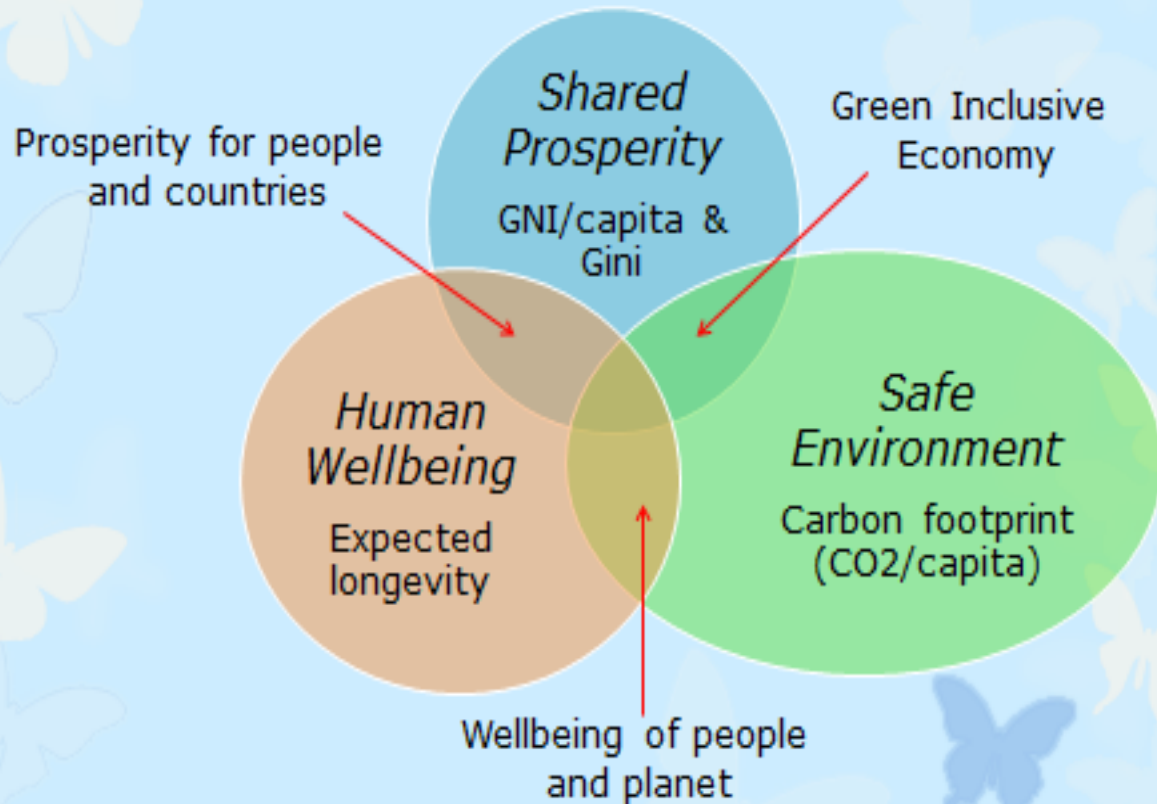
*T. Chuluun*

*Science Advisor to the Minister of EGD*



# Sustainable Development Index for the Post-15 Agenda

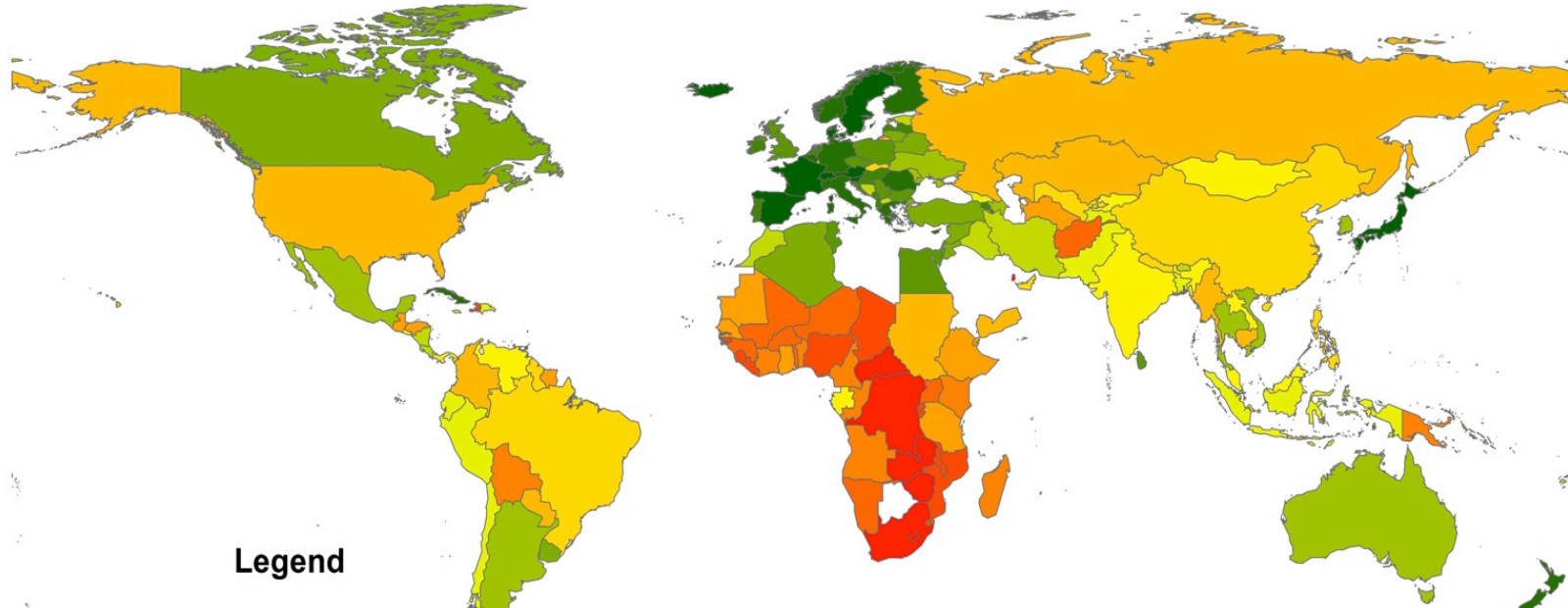
## *Sustainability of People, Countries and Planet*



Human prosperity  
requires global  
sustainability  
- a contribution to  
the Post-2015  
agenda and the  
development of  
Sustainable  
Development Goals

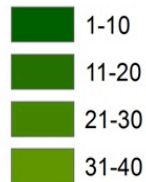
Science review of  
the SDGs (SDG 8)

# Ranking of the countries by the Sustainable Development Index

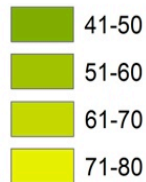


## Legend

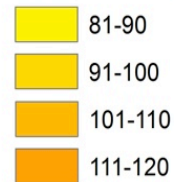
### Very High Sustainability



### High Sustainability



### Low Sustainability



### Very Low Sustainability



# Green civilization in the Anthropocene

Working definition of green civilization:  
“Development that meets the needs of the present while safeguarding Earth’s life-support system, on which the welfare of current and future generations depends.”

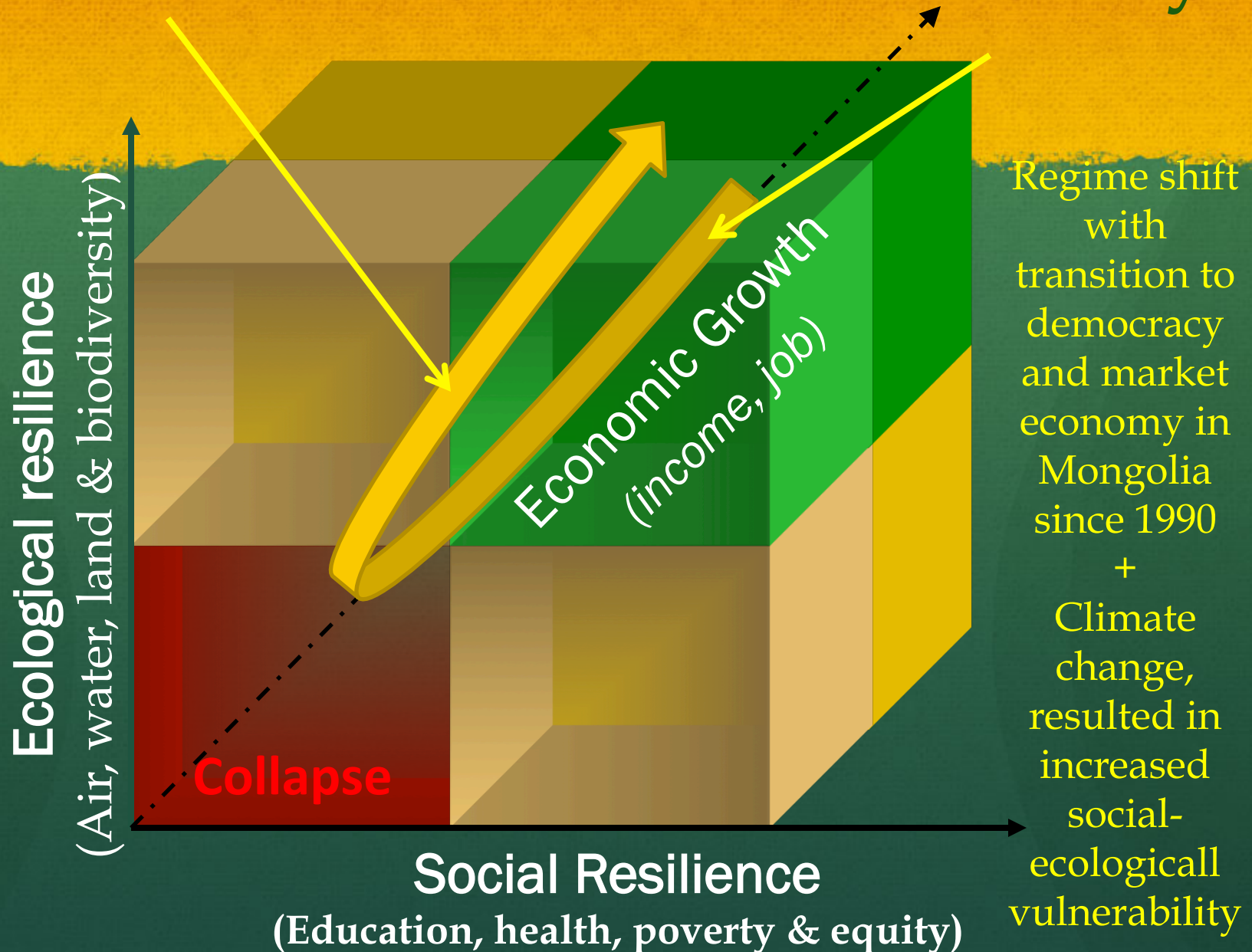
Sustainable development goals for people and planet  
*Nature* 495, 305–307 (2013)

**Earth’s life-support system**

**Civilizations are defined by the economic, political, social, and cultural interactions among them.**

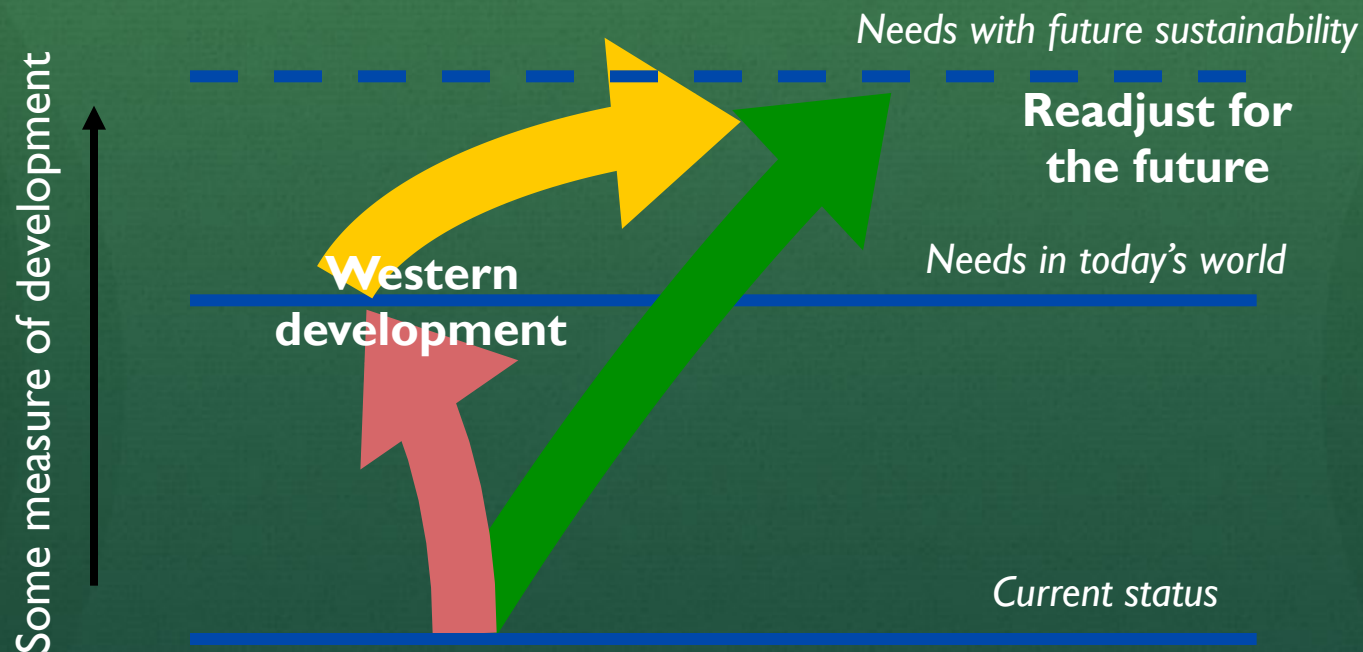


# Transformation towards Sustainability



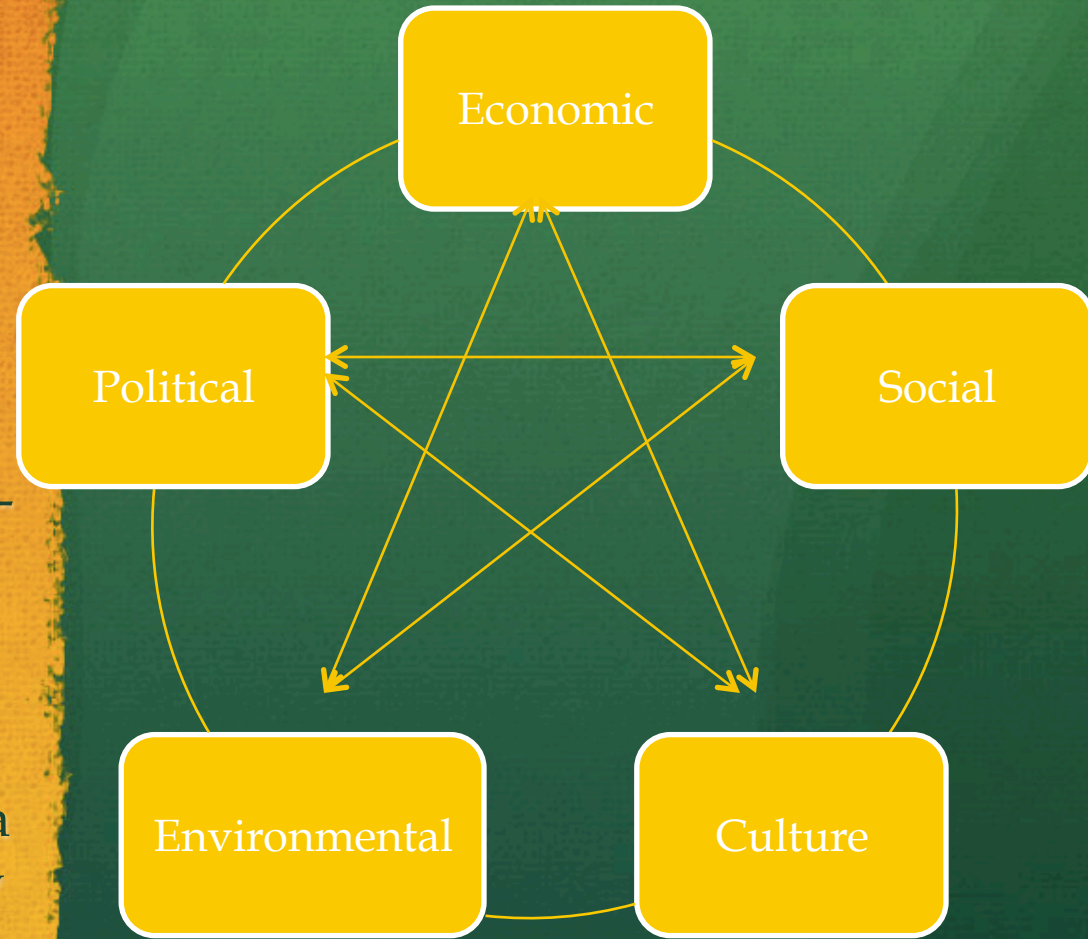
# Green development

- ◎ Seeing it is a 'benefit' of being under-developed!
- ◎ Green development is needed once both human development and global environmental changes are taken into account



# Mongolia as an open complex system

Mongolia is viewed as an **open complex system**, consisted of interconnected political, economic, social, ecological and cultural subsystems as five main organs of the organism, interconnected through father-son and friend-enemy connections (as in folk medicine). For Mongolia's health it is essential to have healthy subsystems. Mongolia made transition to democracy and market economy 2 decades ago, becoming an **open system**.



# Green Development Concept

Political

Sustainable production & consumption

Economic

Green jobs & Poverty reduction

Social

Green economy & finance

Education, Science, Technology & Innovation

Conservation & Restoration

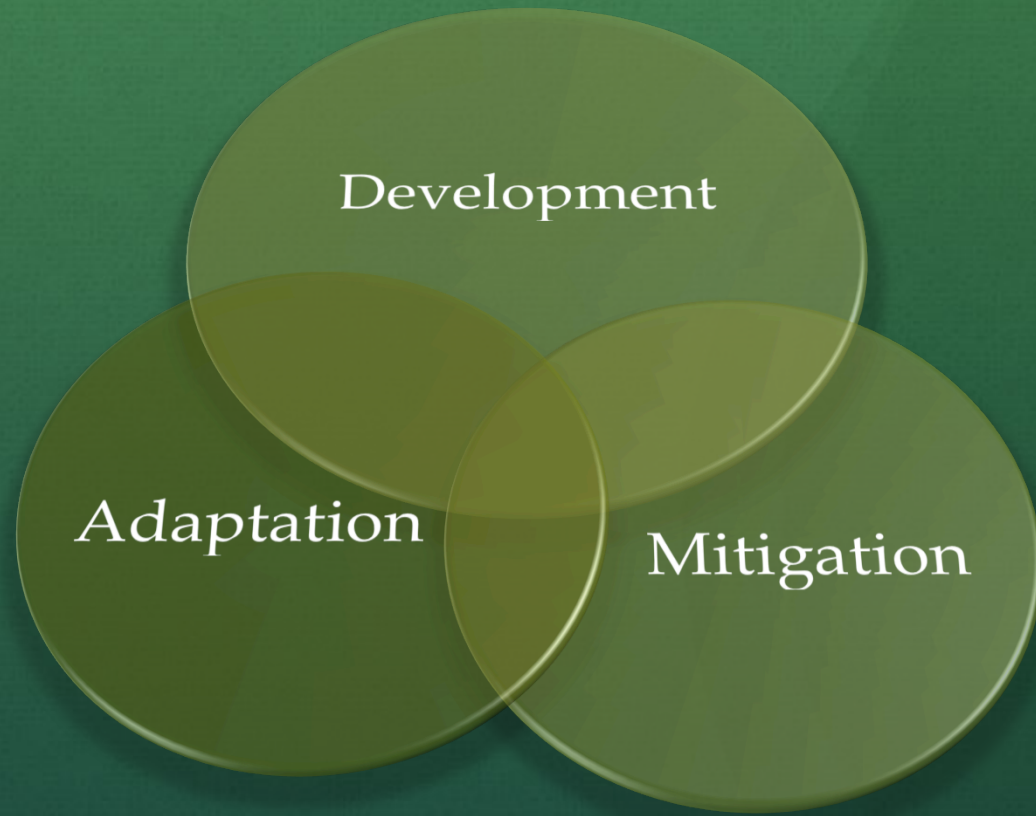
Environmental

Cultural

6 goals  
2014-2020  
2021-2030

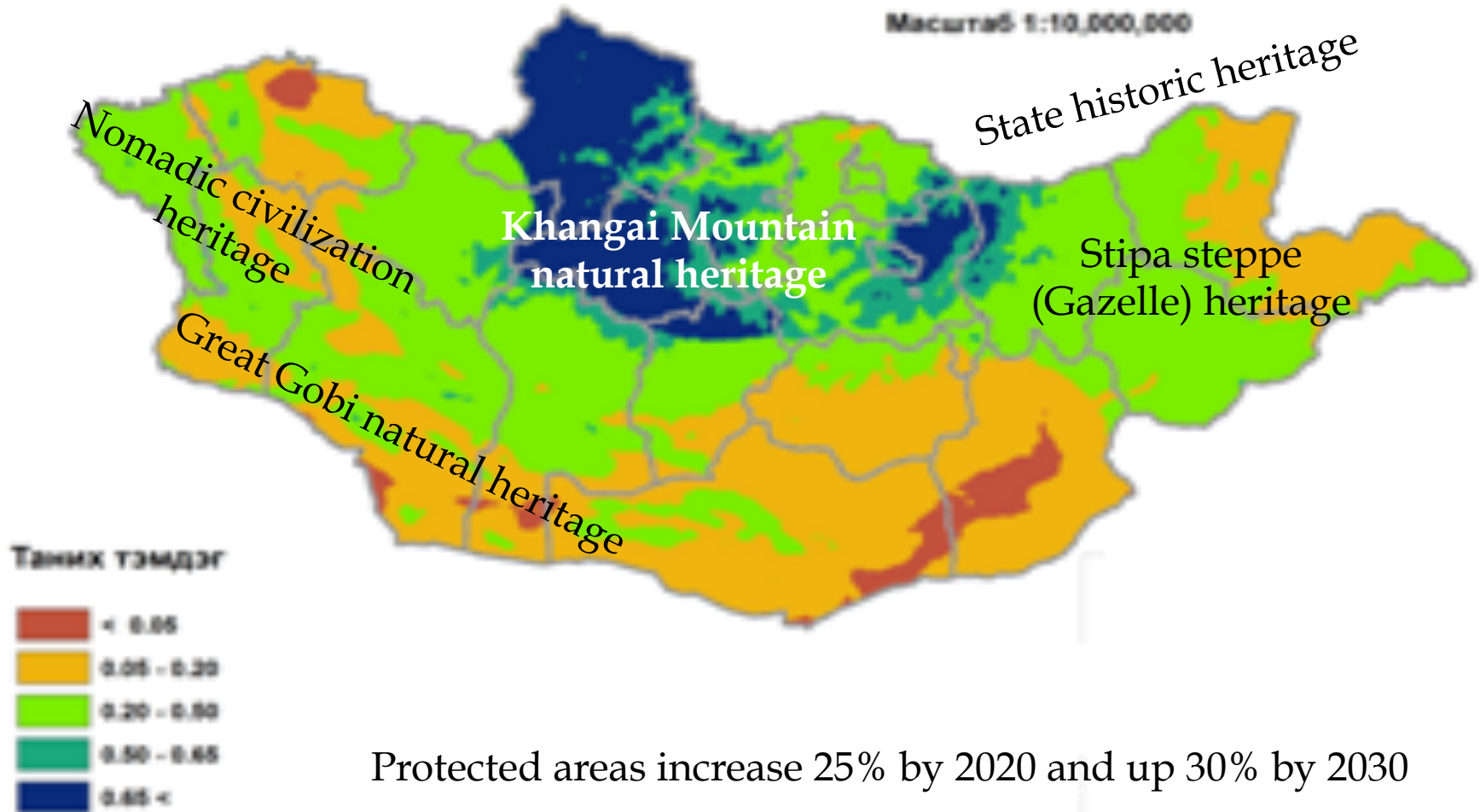
# Sustainable Production and Consumption (SPC)

- **Goal 1.** Resource efficient, low waste and greenhouse gas emission SPC:
- Energy production efficiency 20% by 2030
- Renewable energy fraction in total energy production - 20% by 2020 & 30% by 2030
- Heat loss from buildings - 20% by 2020 & 40% by 2030



# Goal 2. Environmental sustainability

## National Natural, Cultural & Historic Heritages



# *Goal 3: Green Economy & Finance*

- *Green finance for resource efficiency*
  - *Clean technology*
  - *Green purchase*
- *PPP & Corporate social responsibility*



# *Goal 4. Green jobs, poverty and green lifestyle*

- *Supporting green jobs,*
- *reducing poverty,*
- *promoting green lifestyle*
- *increasing quality of life.*



# *Culture and Innovation*

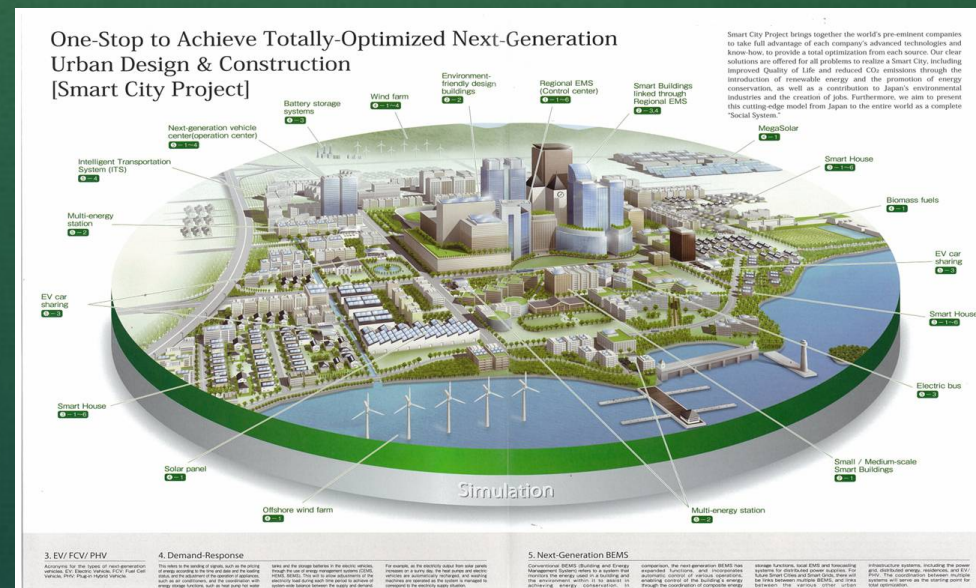
**Goal 5.** *Make education, science, technology, innovation, standards and traditional knowledge as an amplifying mechanism for green development.*

2% of GDP by 2020 and 3% by 2030



# Goal 6. Building green cities and villages, compatible with climate change, natural resources & resilience

- Building green smart cities & villages for quality of life
- Waste reduction - 20% by 2020 & 30% by 2030
- Sustainable public transportation
- Green urban planning



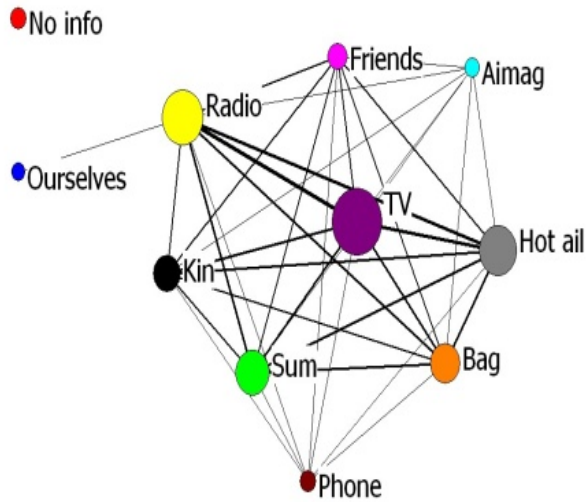
# Green development of aimags

- **Khentii:** Khentii Mountains, Herlen & Onon rivers, Chingis Khaan (& Baganuur),
- **Bulgan, Arkhangai & Ovorkhangai:** Khangai Mountains, Orhon & Selenge rivers,
- **Hovd:** Altai Mountains, diverse ethnic groups
- Khentii, Arkhangai and Bulgan have the largest share of agriculture in the GDP (over 70%), Ovorkhangai and Hovd - (over 60%)

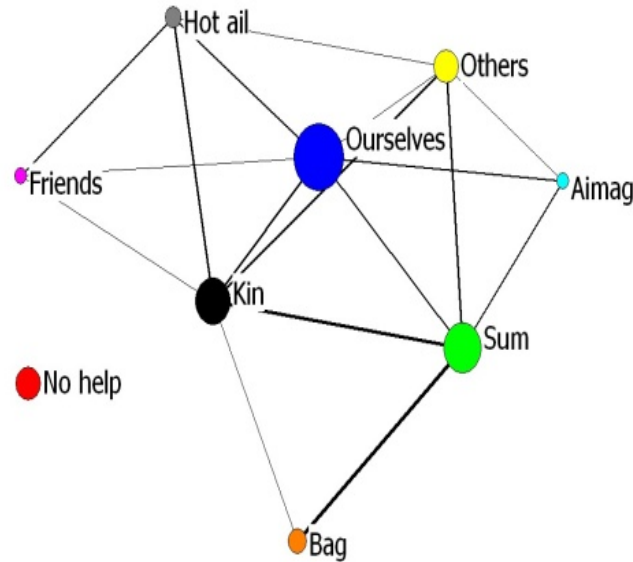
# Factors contributing to vulnerability of rangelands to CC and market

- Climate change (drying trend, water shortage, drought intensity and frequency increase);
- Economic (increased livestock #s, more goats in composition, reduced meat export...);
- Social (increased poverty, reduced education, aging,...)
- Cultural (loss of traditional management like mobility, reserve pastures, informal traditional community)
- State insurance mechanisms (hay preparation, wells, fences, transportation help)
- Legal (lack of strategy, ownership of pastures and water sources...)
- Lack of technological advancement

## Zud Information

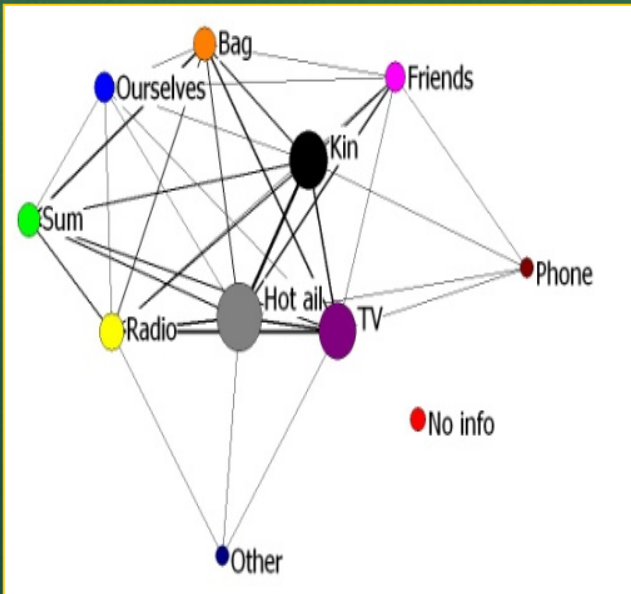


## Zud Help

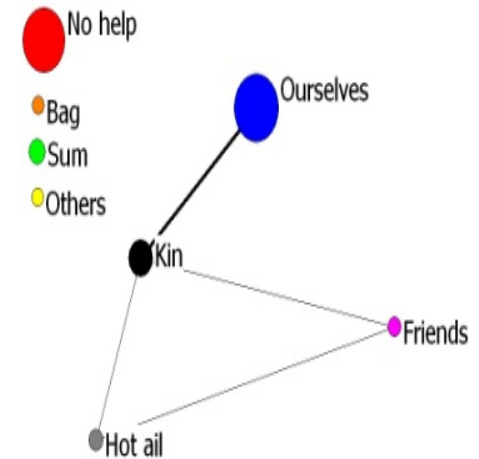


There is poor drought help network, compared to *zud* network!

## Drought Information



## Drought Help



CSU project on  
“Climate  
compatible  
development of  
pastoral system in  
Mongolia”  
Ojima, Chuluun &  
Galvin, 2014

# Key factors for transformation of pastoral social-ecological systems

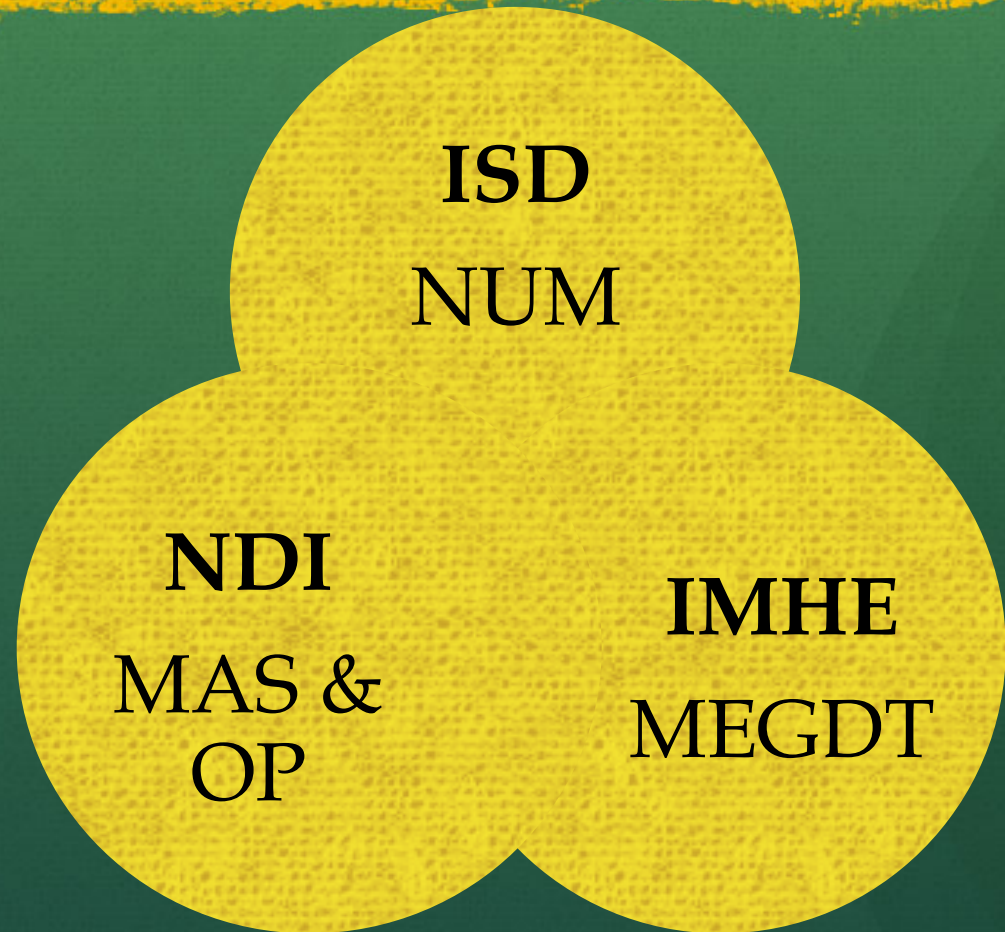
- Public-Private Partnership (PPP)
- Scientific knowledge
  - Permafrost melting
- Traditional knowledge
  - Otor movement
  - Herder Narmandah's experience
- Technology introduction
  - Renewable energy based meat freezing system
  - Koosen (engineering education)

# PPP for transformation of pastoral social-ecological systems

- Rural green development models for:
  - Pastoral systems
  - Sum centers
  - River basins
  - Heritage sites etc.
- Co-design by
  - natural and social scientists,
  - policy makers,
  - engineers etc.
- Co-production & Co-delivery

# ME, Japan (through ChU) enables collaboration for adaptation and GD

- Natural & social scientists
- Science based policy
- R & D
- Green model
- Adaptation planning
- Capacity building
- Teaching at the NUM





# Japan-Mongolia Partnership

- Innovative technology (Hitachi)
- Long-term forecasting of *zud* (IMHE)
- Social-ecological vulnerability (NDI)
- Adaptive capacity (education, community & local PPP) (NUM & ChU)
- Adaptation planning and green development model implementation (NUM & ChU)
  - Introduction of meat freezing system at sum level

# Brief summary



- *Sustainable Development Index* was proposed for the Post 15 development agenda;
- *Green Development Policy of Mongolia* was adopted;
- *Innovative adaptation of pastoral systems in Mongolia*
  - *Science (ChU, NUM, IMHE & NDI)*
  - *PPP: Co-design by scientists, engineers, policy makers, businessmen, producers & consumers (ME, MEGDT, Hitachi)*
  - *International collaboration (Japan & Mongolia)*
    - *Low Carbon Development Partnership*
    - *APAN*

