
EEAC Conclusions Report:

BMUB/EEAC Expert Workshop

Safe Operating Space

**Current State of Debate and Considerations
for National Policies**



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Contents

- Introduction** 5
- 1. State of the Art of the Safe Operating Space (SOS) Framework**... 11
- 2. Bringing the Human Dimension in** 15
- 3. Applying the Concept to European and National Scales** 17
- 4. Strengthening the Salience of the Concept** 19
- 5. Strengthening the Legitimacy of the Framework**..... 21
- SWOT analysis** 23
- References** 26
- Acronyms**..... 28
- Agenda** 29
- List of Participants** 31

This report provides the conclusions extracted by the Network of European Environment and Sustainable Development Advisory Councils (EEAC), from the workshop entitled “**Safe Operating Space: Current State of Debate and Considerations for National Policies**”, held in Brussels on the 23rd -24th of January, 2014.

The workshop was organised by the EEAC and the Advisory Council for the Sustainable Development of Catalonia (CADS), with the financial support of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB).

This report was written by EEAC members Christian Hey (Secretary General of SRU), Sílvia Cañellas-Boltà (CADS Secretariat), Arnau Queralt (Director of CADS), and Michiel de Vries (EEAC Coordinator), with valuable contributions from other EEAC council members, BMUB and workshop participants.

The report is based on the workshop presentations (available at www.eeac.eu) and debates. Part of the content comes from the workshop background paper, which included contributions by Gunther Bachman (Secretary General of the RNE), Sílvia Cañellas-Boltà (CADS Secretariat), Rüdiger Haum (WBGU Secretariat), Christian Hey (Secretary General of the SRU), Carsten Loose (WBGU Secretariat), Jörg Mayer-Ries (Division Head at BMUB), Arnau Queralt (Director of the CADS), Inge Paulini (Secretary General of the WBGU), and Florian Raecke (Desk Officer at the BMUB).

Although the report contains insights expressed by participants during the workshop, the EEAC takes responsibility for the content and unless explicitly stated in no case should it be considered as the opinion of individual participants or organisation partners.

Introduction

The two closely related concepts of “planetary boundaries” and “safe operating space” (see box 1) have gained popularity within the scientific community and with social stakeholders since they were first proposed in 2009 by a group of scientists led by the Stockholm Resilience Centre, in two papers written by Johan Rockström, Will Steffen and others (2009a; 2009b). As discussed in the workshop, they kicked off a rich scientific and political debate on the scientific soundness of the concepts and the nine planetary boundaries proposed¹, on the one hand, and their applicability and consequences for global environmental governance², on the other.

Acknowledging the profound anthropogenic impact on ecosystems, “safe operating space” (SOS) refers to the situation where the capacity of the planet Earth to provide life-support systems for humanity is not endangered, and the adaptive capacities of human societies might not be overburdened. Therefore, there are certain thresholds that should not be surpassed: the planetary boundaries.

Although the SOS concept takes a global –planet Earth– approach, given the integrative potential and communicative capacity of the concept, among other things, it has been argued that the proposed framework could also play a role in environmental policy programmes on a national and European level³.

In order to discuss the relevance of SOS for national policies, in January 2014, the Network of European Environment and Sustainable Development Advisory Councils (EEAC) with the collaboration and financial support of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), organised an international expert workshop with the title **“Safe Operating Space: Current State of Debate and Considerations for National Policies”**. The Advisory Council for the Sustainable Development of Catalonia (CADS), one of the council members of the EEAC network, was responsible for organisational matters.

1. See, for example, the review by Nykvist et al. (2013) and de Vries et al. (2013).

2. See box 4.

3. See the review presented by the ESDN Quarterly Report, October, 2013 (Pisano and Berger, 2013).

The workshop brought together an extraordinary group of 40 participants with different backgrounds and expertise, personally invited for their knowledge and interest in the field. The participants included social and natural scientists from universities and research institutes, high-level policy advisors at international institutions (UNEP and OECD); leading practitioners at European institutions (the European Commission, EESC, EEA), policymakers from national ministries; and members of EEAC network advisory councils, among others.

The two-day workshop included high-quality firsthand presentations –available through the EEAC network website (www.eeac.eu)– followed by informed debates among all the participants. The agenda and list of participants can be found at the end of this report.

This report presents a few strategic conclusions drawn by the EEAC network from the workshop discussions. These are complemented by background information or short presentations on particular topics in the form of separate boxes. The aim is to provide more information for those not familiar with the concepts and to expand on some of the topics that were presented or discussed in the workshop.

The report includes a final part with an overview of the pros and cons of the Safe Operating Space concept that arose in the workshop, taking the form of a SWOT analysis.

We would like to thank all participants for their highly valuable contributions, many of which can be found in this report. However, we would like to highlight that in no case should these be considered as the opinion of individual participants or organisation partners.

It would have been impossible to capture the richness of all the contributions and the in-depth discussions on several topics brought up by speakers and participants. Therefore, we encourage the reader to look at the individual presentations to find further insights.

Safe operating space vs. planetary boundaries

Although “planetary boundaries” is how the concept is better known in the scientific and stakeholder arena, in the workshop we preferred to talk about “safe operating space” (SOS).

SOS includes a notion of precaution in its wording and provides a more positive image than the word “boundary”, which is closely connected to the notion of limits.

On the other hand, SOS might be a more flexible object for policy-making, as it can be applied to different scales of human activity.

Although most participants agreed with this approach, some participants argued that in the international and political arena “planetary boundaries” is how the concept is already named. See, for example, the planetary boundaries discussion within the SDGs and the EU 7th EAP.

Box 1. Safe operating space and planetary boundaries

The concept of a **safe operating space (SOS)** is based on acknowledging that the impact of human activities on the Earth system has reached a scale where abrupt global environmental change can no longer be excluded. This is why scientists refer to a new geological era called *Anthropocene*, which replaces the relatively stable *Holocene* conditions.

The authors proposed a new approach to global sustainability in which they “**define planetary boundaries within which we expect that humanity can operate safely**” (Rockström et al., 2009b).

The planetary boundaries proposed were the following:

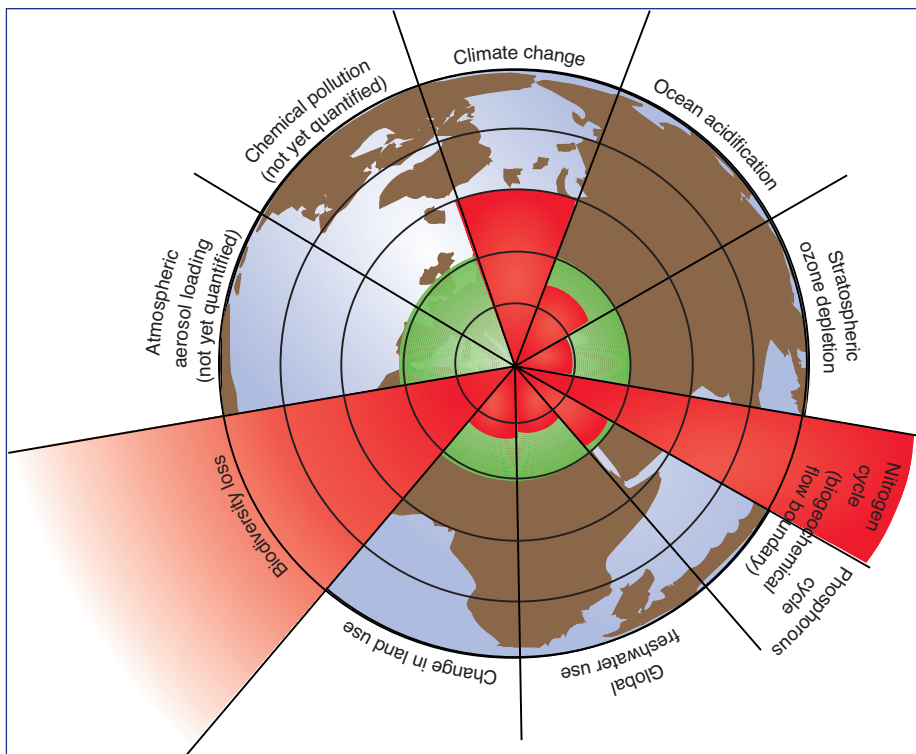
- **climate change** (CO_2 concentration in the atmosphere <350 ppm and/or a maximum change of $+1 \text{ W/m}^2$ in radiative forcing);
- **ocean acidification** (mean surface seawater saturation state with respect to aragonite of at least 80% of pre-industrial levels);
- **stratospheric ozone** ($<5\%$ reduction in O_3 concentration from pre-industrial level of 290 Dobson Units);
- **biogeochemical nitrogen (N) cycle** (limit industrial and agricultural fixation of N_2 to 35 Tg N/yr) **and phosphorus (P) cycle** (annual P inflow to oceans not to exceed 10 times the natural background weathering of P);
- **global freshwater use** ($<4000 \text{ km}^3/\text{yr}$ of consumptive use of runoff resources); land system change ($<15\%$ of the ice-free land surface under cropland);
- the **rate at which biological diversity is lost** (annual rate of <10 extinctions per million species).
- **chemical pollution** (not quantified yet)
- **atmospheric aerosol loading** (not quantified yet).

Transgressing one or more planetary boundaries may be harmful or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental to planetary-scale systems (Rockström et al., 2009b). The authors estimate

that humanity has already transgressed three planetary boundaries: for climate change, rate of biodiversity loss, and changes to the global nitrogen cycle (see figure 1).

More information is available on the Stockholm Resilience Centre website:

<http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries.html>



Credit: Azote images / Stockholm Resilience Centre

Figure 1. The nine planetary boundaries

Box 2. Safe operating space and related concepts

The safe operating space framework can be related to other frameworks that have been present on the international environmental agenda for many decades, from the limits to growth debate started in 1972 by the Club of Rome to the sustainable development framework established by the Brundtland Commission report in 1987 and the Rio principles in 1992. Other related concepts are the carrying capacity of the Earth system, the ecological footprint, strong sustainability, environmental space, ecosystem services and the work of the Millennium Ecosystem Assessment, among others.

There are also other principles of similar political and conceptual outreach, some of which are competing, while others are subsidiary. Some related principles are: the precautionary principle, the principle of emergency response and averting dangerous impact; the no-regret-principle, cooperation, and environmental profit and loss calculation.

A predecessor to the safe operating space was the concept of guardrails developed by the WBGU (German Advisory Council of Global Change) in a series of reports from 1995 onwards (e.g. WBGU, 2006). The WBGU defines guardrails as limits that “demarcate the realm of desirable and sustainable development trajectories.” “A breach of these limits would give rise either immediately or in future to intolerable consequences so significant that even major utility gains in other fields could not compensate for the damage.” It has, *inter alia*, been formulated for climate change (the 2°C guardrail) and for oceans (acidification, sea-level rise, marine ecosystems).

1. State of the Art of the Safe Operating Space (SOS) Framework

The scientific knowledge and refinement of the concept have considerably improved since the first publication mentioned it in 2009. As mentioned by Prof. Will Steffen, one of the main authors of the paper, a “Planetary Boundaries 2.0” is being prepared and will be published soon by the Stockholm Resilience Centre. The new report will have a better understanding of the multilevel and interconnected systemic dimensions of the problems, and out of the 9 planetary boundaries it identifies a few “core boundaries” (climate system, ecosystem integrity, new entities) and better integrates the human dimension into the concept.

On the basis of the overall discussions, we have concluded:

There is a strong case for concern. The SOS framework primarily deals with macro-trends at the global level with long-term impacts on the biosphere and severe risks for human well-being, political stability and economic development. A major issue of concern is the “Great acceleration” of human intervention into the biosphere and the resulting risk of “regime shifts” of historical dimensions leading to a man-shaped *Anthropocene* period characterized by much more hostile, unpredictable and unstable conditions for mankind than the *Holocene* (see box 1 and Prof. Steffen’s presentation).

The level and quality of knowledge is sufficient to stir to action. While each of the suggested parameters for a planetary boundary ensuring a safe operating space for mankind may be subject to scientific discussion and further refinement, there is little doubt that prevailing economic development paradigms need to be changed in order to shift mankind back into the safe operating space. There is enough evidence on state and regime shifts as a consequence of anthropogenic interference, such as climate change, accelerated loss of terrestrial and marine biodiversity, and ecosystem resilience or overuse of natural resources.

Box 3. The new EU 7th Environmental Action Program

In 2013, the EU approved the new 7th Environment Action Program, which will guide the environmental policy agenda until 2020, with the title “Living Well, Within the Limits of Our Planet”. It includes direct references to the concept of planetary boundaries (PB):

- a) In the initial statements: 8.(...) *there is evidence that PB for biodiversity, climate change and the nitrogen cycle have already been transgressed (...)*
- b) Within the priority objective of improving the knowledge and evidence base for EU environment policy: 71.(1).(..) *While available evidence fully warrants precautionary action in such areas, further research into PB, systemic risks and our society’s ability to cope with them will support the development of the most appropriate responses. (..)*
- c) In relation to international environmental policy: 73.(...) *the 7th EAP shall ensure that by 2020:(...) (d) the impact of the Union and its Member States in international science-policy forums is enhanced in order to improve the knowledge base for international environment policy. This requires, in particular: (i) coordinating, sharing and promoting research efforts at Union and Member State level with regard to addressing key environmental knowledge gaps, including the risks of crossing environmental tipping points and PB; (...)*
- d) In relation to EU consumption impact abroad and the post-2015 framework: 106.(c).(viii) (...) *ensuring that economic and social progress is achieved within the carrying capacity of the Earth, by increasing understanding of PB, inter alia, in the development of the post-2015 framework in order to secure human well-being and prosperity in the long-term.*

The SOS concept is useful to raise consciousness and develop solutions.

The relevance of the concept is to raise political consciousness regarding the limits of our planet, the essential role of life-supporting systems for a human well-being, non-linear system responses to human interference, and key issues for policy attention. So it is a starting point for developing solutions. Other positive features of the framework are that the image (figure 1) has a

strong communication power and that the nine planetary boundaries form a limited set of key issues.

There is a need for a more systemic approach to the different themes.

The main challenges for the future are to strengthen the understanding of the interlinkages between different environmental themes, to more carefully elaborate the multilevel, multi-scale dimension of the concept and to improve the systemic quality of the approach. For example, differentiating between earth system parameters (e.g. climate system, ecosystem integrity) and key pressures (e.g. nutrient loads, excess resource use). A systemic view

Box 4. Safe operating space at the international arena

At the international level, planetary boundaries have been argued to be relevant for the integration of the environmental dimension into the upcoming framework of the UN sustainable development goals (SDGs).

It was present at the preparations for the Rio+20 Summit held in June 2012 and other international forums. For example, the report from the UN Secretary General's high-level panel on global sustainability (2012), *Resilient People, Resilient Planet: A Future Worth Choosing*, makes broad references to planetary boundaries, environmental thresholds and tipping points.

The Nordic Council of Ministers has been active in suggesting planetary boundaries to play a role in the definition of the Sustainable Development Goals (see e.g. Schultz et al., 2013). In November 2013, Finland, in cooperation with Sweden, Norway, Denmark, UNEP and the Stockholm Resilience Centre (SRC) organized an international workshop called *Planetary Boundaries and Environmental Tipping Points: What Do They Mean For Sustainable Development and The Global Agenda?* The focus of the workshop was to increase the understanding of the importance of biophysical boundaries in sustainable development and to recognize the social and economic aspects linked to it.

The co-chairs' summary note and more information can be found on the workshop website: <http://www.ym.fi/planetaryboundaries>

of the interlinkages between different environmental issues also improves awareness of unwanted side effects of policies, such as creating new problems while pursuing overly narrow policy solutions. Bioenergy support is a well-known case in point.

The human dimension in the framework needs to be strengthened. What is needed is a better understanding of the results of surpassing critical thresholds for human societies (e.g. the cost of inaction), of capacities and strategies for transitions back into the “safe operating space” and a target-oriented communication strategy in order to engage powerful actors. The concept should be better linked to essential human values such as safety, well-being and welfare, human and environmental rights, non-violence and peace or quality of life in order to broaden societal understanding and support.

The SOS framework may become a sound starting point for environmental programming also at national and European levels. It delivers a benchmark for formulating policy targets and timetables and for assessing the depth of the transitions needed. The 7th Environmental Action Programme of the EU “Living Well within the Limits of the Planet” already contains a mandate to develop policies in line with the SOS concept (see box 3). Also some Member States are planning to link their national environmental programs or sustainable development strategies to the framework. At the global level, the framework is promoted in order to integrate environmental and Millennium Development goals into a new set of Sustainable Development Goals (see box 4). This will feed back into national or regional programming processes. But the SOS framework is not sufficient as a stand-alone. It is part of a discourse on problem areas which must be linked to the discourse on solutions in order to gain societal momentum.

2. Bringing the Human Dimension in

The considerable progress already made to bring the human dimension back into the concept is to be appreciated and welcomed. A stronger integration of the human dimension into the framework is vital, as in democratic societies salience and legitimacy are as important in finding acceptance by political majorities⁴ as the scientific solidity of the concept.

A first and most important addition is the widely accepted concept of the “safe and just operating space”, known as the “Doughnut approach”. As proposed by Kate Raworth in her presentation, achieving sustainable development means ensuring that all people have the resources needed –such as food, water, healthcare, and energy– to fulfil their human rights. The “safe

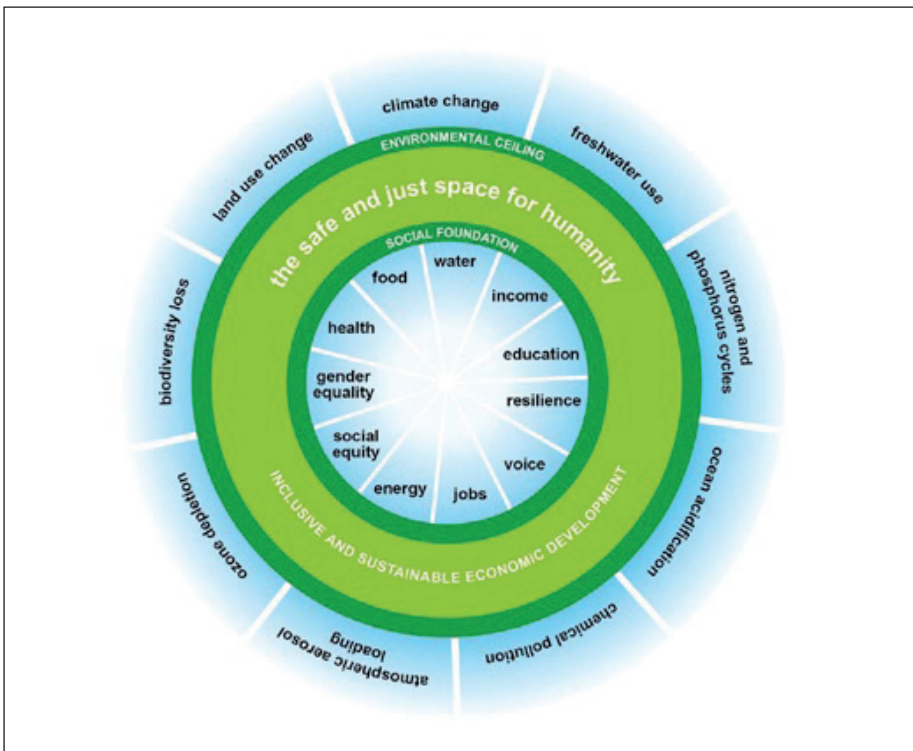


Figure 2. A safe and just space for humanity (Raworth, 2012)

4. See Hey (2012).

and just operating space” hence has an upper environmental ceiling and minimum social levels to allow decent living conditions for 9 billion people. In a visual representation (figure 2), it is a doughnut rather than a circle. The Doughnut approach calls for differentiated economic development strategies. Whereas the main challenge for rich industrialised countries is to reduce natural resource consumption back to safe levels, emerging economies might need a mixture of both and poor countries may have some environmental space for prioritizing a social agenda.

For the EEAC it is clear that the framework calls for a new economic development paradigm and deep transformations, although this goes beyond the conclusions set out by the concept authors. It is not certain if the existing frameworks, such as ecological modernization, green economy, green growth or resource efficiency will fully deliver the changes needed. They are helpful to go some way, but the lessons from a recent EEA report (presented by Thomas Henrichs), that the EU is relatively successful on “resource efficiency” indicators, but rather fails on “resilience” indicators should be taken seriously for further strategy framing. On the other hand, it is not advisable to link the SOS concept too rapidly with the emerging degrowth agenda, as this would endanger the political acceptance of the framework. A case by case approach linked to specific problem areas seems to be more appropriate.

Closer attention should be paid to the equity dimension of the concept. Any notion of “biophysical limits” also implies that there are certain budgets for acceptable resource use or emissions. This raises the critical question of a fair distribution of users’ rights in an extremely unequal world, as raised by Kate Raworth and Joan Martínez-Alier’s presentations. Some lessons may be drawn from the “contraction and convergence” approach in the climate debate, which at least in Europe has been accepted as guiding long-term European greenhouse reduction targets. A bottom-up approach also needs to be strengthened, starting with “environmental rights” especially for those groups which are most affected and most vulnerable to the loss of ecosystem resilience.

3. Applying the Concept to European and National Scales

The Safe Operating Space Framework should better integrate the multi-scale dimension of environmental pressures. Only a few processes are genuinely earth system types – others only have a global dimension due to their aggregate or ubiquitous nature (e.g. excess nutrients) or due to system-interlinkage (e.g. climate change and water-scarcity). For environmental concerns it is of utmost importance to be sensitive to local sensitivities and hotspot situations which might be overlooked by a purely global approach. Furthermore, from a governance perspective it is sometimes easier to sustain local commons (e.g. drinking water reservoirs) than to find agreement for safeguarding global commons. So from both a problem perspective as well as a governance perspective the multi-scale dimension of the safe operating space is important.

The SOS framework can be used to introduce the dimension of the external impact of domestic consumption into environmental policies. National and European Environmental Programmes, such as the 7th EAP of the European Union, can play an important role if they properly address the respective geographical scales and also establish national or regional responsibility for global commons. We appreciate the work done or prepared in Sweden (box 5), Switzerland (box 6), Germany and the European Union (box 3) to apply the SOS framework for national or regional environmental programming.

Although not exclusive of this approach, the Swedish and Swiss examples show that the framework is useful for dealing with the external dimension of domestic consumption, this is, the responsibility of each citizen, country or region for impact produced beyond its own borders. In that sense, the external dimension of consumption patterns should be carefully assessed, and as shown by Pascal Peduzzi there are various methodological options. Whereas production in industrialised countries has become cleaner, polluting activities have been outsourced to exporting countries. For example, as stated by Andreas Hauser, in Switzerland more than 60% of all environmental impact due to Swiss consumption occurs abroad, as a result of imported goods and services (box 6).

Box 5. Swedish study on planetary boundaries

The Swedish Environmental Protection Agency commissioned a report to the SRC on “National Environment Performance on Planetary Boundaries” (Nykvist et al., 2013), presented by Björn Nykvist and Katrin Zimmer at the workshop.

The report is the first attempt to downscale the planetary boundaries framework to the level of a country. The objective was to study whether the PB framework can be used to assess the “generational goal”, this is *“[t]he overall goal of Swedish environmental policy is to hand over to the next generation a society in which the major environmental problems in Sweden have been solved, without increasing environmental and health problems outside Sweden’s borders”*.

The report compares the 9 planetary boundaries (PB) to the Swedish national environmental objectives and found a strong correlation. The authors propose different indicators that translate the global PB into *per capita* boundaries, and then they compare performance among countries. Interestingly the report uses consumption-based indicators to capture the impact of the Swedish economy beyond its own borders. Moreover, they analysed whether PB are matched with existing multilateral environmental agreements (MEAs), and found that all boundaries are covered by MEAs except for ocean acidification. The main problem is the limited progress on already existing goals.

4. Strengthening the Saliency of the Concept

Earth system science is systemic, aggregated and relatively abstract. Even though the loss of ecosystem resilience is a matter of overall concern, those groups potentially affected may not be fully aware. Political momentum can be increased by improving saliency, e.g. by better communicating and by translating systemic threats into stakeholder concerns. Some concepts that have the potential to enhance the saliency of the SOS framework were presented in the workshop:

The Resource-Nexus translates general concerns into a specific local or regional context. As presented by Raimund Bleischwitz, the resource nexus approach looks into constellations of interacting environmental and social problems, such as water scarcity, climate change, food availability and political stability for a given region. Such problem hotspots receive a great deal of attention from communities and stakeholders normally not primarily interested in environmental issues, such as the business sector or security experts. A very recent example is Coca-Cola warning about the impact of climate change on the availability of drinking water resources.

The Economics of an Ecosystem Services Approach helps to translate a basically natural science-based concept into the language of economic decision-makers. Even though the TEEB approach primarily helps to decide trade-offs in specific situations, as explained by Laurence Jones, it is also useful for at least partly communicating the issue of ecosystem resilience to an audience concerned with economic issues. One caveat, however, must be expressed: that prices can never tell the ecological truth – as the market price system and ecosystems follow different logics.

Of utmost importance is the foreseen OECD Circle Project (The Cost of Inaction and Consequences for Long-Term Growth): The project, presented by Shardul Agrawala, analyses the feedback slope between resilience loss and the economy. The analysis may be broader and more comprehensive than the TEEB approach, as it looks into the overall impact on GDP. The project examines the hypothesis that the GDP will be considerably lower without overall mitigation. This is of critical importance to bring the Safe Operating Space framework into the core of economic concerns and hence to close the feedback loop from anthropogenic interference to vital earth systems back to human welfare.

Box 6. Swiss study on green economy and planetary boundaries

Following a popular initiative for a constitutional amendment submitted in 2012 to reduce the Swiss ecological footprint to one Earth in 2050, the Government committed to reducing environmental impact in Switzerland, taking into account impact caused abroad. In this context, some reports were commissioned to measure the impact of Swiss production and consumption⁵ and to set the targets for environmental policy.

Researchers at UNEP-Grid Geneva are conducting a study called “Green Economy: Translating the Limits of Our Planet into Environmental Targets for Switzerland”, inspired by the Swedish report (see box 5). The aim is to set environmental targets for each globally important environmental aspect (e.g. the nine planetary boundaries). Expected outcomes of the project are recommendations for a carbon footprint target, a nitrogen footprint target, a land-use footprint target etc. on the national level. A consumption perspective is taken to capture the impact that takes place abroad.

5. For instance, Frischknecht et al. (2013): Tracking Important Environmental Impacts Related to Domestic Consumption

5. Strengthening the Legitimacy of the Framework

The article of Rockström et al. (2009a) in *"Nature"* on Planetary Boundaries was a successful wake-up call from concerned scientists to the political sphere. It is remarkable how this article kicked off further scientific work, raised the attention of policy advisory councils, such as the EEAC, but also many others at national and international levels. We can see an emerging epistemic community around the concept. It is now necessary to deepen the interaction and to promote institutionalised cooperation between the scientific, the policy advisory and respective political communities in order to broaden support. In that sense, this workshop was a good starter. But further work is necessary to strengthen the solidity and political acceptance of the SOS Framework.

Science-Policy interfaces working on matters relevant for the SOS Framework at all levels need to be strengthened or established. Interfaces such as the IPCC, the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), the International Resource Panel (IRP), the recently established UN Scientific Advisory Board (SAB) play a pivotal role in communicating and in strengthening interaction, mutual learning and acceptance for work within global environmental regimes. Similar structures can also be identified at regional, European or national levels. The EEA, the network of European Environmental Protection Agencies, the EEAC, European Academies Science Advisory Council, may play a catalytic role to offer the necessary scientific evidence, while environmental programming at national and European levels may strengthen political demand for science-based advice. Both need to cooperate closely in order to develop a policy agenda which is up to the challenges ahead.

More attention should be given to a target group-oriented communication of the SOS Framework. Of pivotal importance are strong narratives, which are helpful in forming and strengthening coalitions, which may advocate for the necessary transitions to a society living well within the limits of our planet. Isolated approaches only addressing negative effects on ecosystem resilience or only highlighting the business opportunities of

a green and resource-efficient economy will fall short of the challenge. The narratives should not only communicate problems and solutions together, they should also address the concerns and key interests of different societal groups.

SWOT analysis

The workshop discussions included several thoughts on the pros and cons of the Safe Operating Space concept as a science-based, policy-oriented concept. Here we present a wide range of such reflections using the form of a SWOT analysis (this is: Strengths, Weaknesses, Opportunities and Threats).

Strengths

The notion of the original SOS concept:

- Is policy oriented and easy to communicate politically
- Is a strong argument for transformative policy action
- Broadens perspectives beyond the current focus on climate change
- Echoes current trends to think “holistically, integrative and cross-sectorally”
- Brings natural and social sciences together
- Helps to inform as a goal/target and evidence-based governance approach
- Supports a global, integrated view of the earth system
- Is a benchmark for assessing green growth, decoupling or transformation strategies and for thinking beyond

The nine different dimensions of the SOS concept:

- Show conservation/protection aspects of natural systems besides utilization aspects
- Show the relevance of natural resources in a broad sense
- Underline the multitude of natural systems we all depend on
- Offer linkage to systemic interdependence, nexus, resilience approaches

Opportunities

The notion of the SOS concept:

- Defining the concept opens debate, conceptual work and may become a sound starting point for renewed environmental governance and programming
- The human/equity dimension is getting increasing attention in the further development of the concept (safe and just environmental space)
- Through the linkages between the dimensions, the external effects of human activities at local, regional and national levels may become visible
- It attracts the attention of policy-makers at all levels to take the interlinkages of the nine dimensions and boundaries into account, e.g. for the SDG/post2015 agenda
- It may serve to focus research and monitoring activities
- Transferring lessons from climate target setting to other pressing environmental issues

Weaknesses

The notion of the original SOS concept:

- A boundary cannot be exactly established
- Provides little guidance for local, national or regional thresholds/limits
- Does not translate easily into e.g. first mover advantages or strategic national interests
- Is not explicit in value judgments: thresholds between safe/unsafe space depend on the degree of societal risk aversion/ level of precaution
- The selection of themes is debatable. New boundary proposed: use of non-renewable resources?
- The social and economic dimension is neglected

Threats

The notion of the SOS concept:

- Some uncertainty about the development of the concept due to current revision
- Translating systemic threats into stakeholder concerns is difficult
- Stressing linkages between the nine boundaries as well as the linkages between the concept and other related concepts threatens the original simplicity and intuitive rationale of the concept
- The leading paradigm of “progress” as “growth” in political and societal thinking could infringe upon the introduction of boundaries and limitations as made by the SOS concept
- Difficulties in setting boundaries for (coupled) systems
- It is framed as a global public good, which could be an incentive to “free-ride” behavior
- It needs global governance architecture to succeed, while far-reaching uncertainties and the missing political binding character make the concept non-viable as basis for burden-sharing

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Acronyms

BMUB - German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

CADS – Advisory Council for Sustainable Development of Catalonia

EEA – European Environmental Agency

EAP – Environmental Action Programme

EEAC – Network of European Environment and Sustainable Development Advisory Councils

EESC - European Economic and Social Committee

EU – European Union

GDP – Gross Domestic Product

OECD – Organisation for Economic Co-operation and Development

PB – Planetary Boundaries

SDG – Sustainable Development Goals

SOS – Safe Operating Space

SRC – Stockholm Resilience Centre

SRU – German Advisory Council on the Environment

TEEB – The Economics of Ecosystem and Biodiversity

UNEP – United Nations Environmental Programme

WBGU - German Advisory Council on Global Change

Agenda

1st Day

Safe Operating Space and Environmental Policy Planning – State of the Art	
13.30 h	<p>Introduction: Objectives of the workshop</p> <p>Dr. Jörg Mayer-Ries, Head of Division General and Strategic Aspects of Environmental Policy, Environmental Protection and Sustainability Strategies. German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB).</p> <p>Mr Arnau Queralt, Director of the Advisory Council for the Sustainable Development of Catalonia (CADS).</p>
13.45 h	Tour de Table – Background, Concerns and Interest
14.30 h	<p>Session I. Safe Operating Space – State of Knowledge and Current Scientific Background</p> <p>Introduction and moderation: Dr. Christian Hey, Secretary General of the German Advisory Council on the Environment (SRU).</p> <p>Keynote: Prof. Will Steffen, Climate Change Institute at the Australian National University.</p> <p>Complementary and critical comments concerning:</p> <ul style="list-style-type: none"> – Economic aspects: Ms Kate Raworth, Senior Visiting Research Associate. Oxford University’s Environmental Change Institute. – Environmental Justice within Planetary Boundaries: Prof. Joan Martínez-Alier, Autonomous University of Barcelona. Former President of the International Society for Ecological Economics (ISEE). – Governance aspects: Dr. Falk Schmidt, Academic Officer Executive Office. Institute for Advanced Sustainability Studies (IASS) Potsdam.
16.30 h	Coffee-Break
16.45 h	<p>Session II: Underlying concepts</p> <p>Introduction and moderation: Ms Agneta Andersson. International Coordinator, Dutch Council for the Environment and Infrastructure (RLI).</p> <ul style="list-style-type: none"> – The value of Ecosystem Services as key argument. Dr. Laurence Jones, Researcher at Centre for Ecology and Hydrology. Environment Centre Wales. – The systemic dimension, security and precaution: Interlinkages and Interdependence. A resource nexus perspective: Prof. Dr. Raimund Bleischwitz. BHP Billiton Chair in Sustainable Global Resources. University College London, Institute for Sustainable Resources. – Resource Efficiency and Resilience: when is the one fit of the other? Mr Thomas Henrichs. Project Manager. Integrated environmental assessments. European Environment Agency (EEA).
19:00 h	<p>Dinner</p> <p>Speech by Prof. Hans Bruyninckx. Executive Director. European Environment Agency (EEA).</p>

2nd Day

Safe Operating Space and Environmental Policy Planning – Perspective	
9.00 h	Wrap-up of Day 1
9.15 h	<p>Session III. International Policy Dimension of Planetary Boundaries</p> <p>Introduction and moderation: Mr Jan Mertens. Belgian Federal Council for Sustainable Development.</p> <ul style="list-style-type: none"> – Dr. Shardul Agrawala. Head of the Environment and Economy Integration Division. Environment Directorate (EEI/ENV). Organisation for Economic Co-operation and Development (OECD). – Mr Jakub Wejchert. Policy Officer for Global Sustainability. European Commission (DG ENV). – Dr. Pascal Peduzzi. Head of Global Change and Vulnerability Unit. DEWA/GRID-Geneva/United Nations Environment Programme (UNEP).
10.30 h	Coffee Break
10.45 h	<p>Session IV. The EU and national relevance of the concept</p> <p>Introduction and moderation: Dr. Jörg Mayer-Ries, BMU.</p> <p>Dr. Björn Nykvist. Research fellow at Stockholm Environment Institute (SEI) and Stockholm Resilience Centre (SRC).</p> <p>A national perspective:</p> <ul style="list-style-type: none"> – Ms Katrin Zimmer. International cooperation unit, Swedish Environmental Protection Agency. – Mr Andreas Hauser. Scientific Officer, Federal Department of the Environment, Transport, Energy and Communications, Switzerland – Prof. Dr. Maarten Hajer, Director, PBL Netherlands Environmental Assessment Agency.
12.30 h	Lunch
13.30h	<p>Open Debate</p> <p>Introduction and moderation: Prof. Dr. Miranda Schreurs. Chair of the EEAC and member of SRU.</p>
15:15 h	<p>Summary</p> <p>Dr. Jörg Mayer-Ries, BMUB.</p> <p>Dr. Sarah Cornell. Coordinator of the Planetary Boundaries Research Initiative. Stockholm Resilience Centre (SRC).</p>
15.30 h	Farewell

List of Participants

Name	Position	Organisation
Shardul Agrawala	Head, Environment and Economy Integration Division. Environment Directorate	Organisation for Economic Co-operation and Development (OECD)
Agneta Andersson	International Coordinator	Dutch Council for the Environment and Infrastructure (RLI)
Gábor Bartus	Secretary General	National Council for Sustainable Development Hungary (NFFT)
Raimund Bleischwitz	BHP Billiton Chair in Sustainable Global Resources	University College London UCL Institute for Sustainable Resources
Hans Bruyninckx	Executive Director	European Environmental Agency (EEA)
Sílvia Cañellas-Boltà	Desk Officer	Advisory Council for Sustainable Development of Catalonia (CADS)
Sarah Cornell	Coordinator of the Planetary Boundaries Research Initiative	Stockholm Resilience Centre (SRC)
Arthur Eijs	Policy Advisor	Department of International Affairs. Dutch Ministry of Infrastructure and Environment
Heidi Foth	Council Member	German Advisory Council on the Environment (SRU)
Maarten Hajer	Director	PBL Netherlands Environmental Assessment Agency
Andreas Hauser	Scientific Officer	Federal Department of the Environment, Transport, Energy and Communications. Switzerland
Thomas Henrichs	Project Manager - Integrated Environmental Assessments	European Environmental Agency
Christian Hey	Secretary General	German Advisory Council on the Environment (SRU)
Laurence Jones	Researcher	Centre for Ecology & Hydrology. Environment Centre Wales

Name	Position	Organisation
Marcel Kok	Senior Scientific Researcher	PBL Netherlands Environmental Assessment Agency
Frank Wugt Larsen	Project Manager - Biodiversity Assessments and Networks	European Environmental Agency
Annika Lindblom	Ministerial Adviser, International Affairs	Ministry of the Environment. Finland
Joan Martínez-Alier	Emeritus Professor	Institute for Environmental Science and Technology, Autonomous University of Barcelona
Jörg Mayer-Ries	Head of Division for General and Strategic Aspects of Environmental Policy, Environmental Protection and Sustainability Strategies	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)
Jan Mertens	Scientific Staff	Belgian Federal Council for Sustainable Development
Björn Nykvist	Research Fellow	Stockholm Environment Institute (SEI)
	Post Doc	Stockholm Resilience Centre (SRC)
Derek Osborn	Board of Directors/Non-Executive Director	Stakeholder Forum
Pascal Peduzzi	Head of Global Change and Vulnerability Unit	Division of Early Warning and Assessment (EWA)/ Global Resource Information Database (GRID)-Geneva. United Nations Environment Program (UNEP)
Angelica Picciocchi	Commission for the Infrastructure Network, Transport, Energy Policy and Environment	Italian Council for the Economy and Labour
Umberto Pisano	ESDN office team	ESDN - European Sustainable Development Network
	Research Fellow	Institute for Managing Sustainability Vienna University of Economics and Business

Name	Position	Organisation
Pere Puig	Head of the Delegation	Delegation of the Government of Catalonia to the European Union
Arnau Queralt	Director	Advisory Council for the Sustainable Development of Catalonia (CADS)
Florian Raecke	Desk Officer. Division for General and Strategic Aspects of Environmental Policy, Environmental Protection and Sustainability Strategies	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)
Kate Raworth	Visiting Fellow in Economics	International Institute for Environment and Development
	Senior Visiting Research Associate	Environmental Change Institute, Oxford University
Falk Schmidt	Academic Officer Executive Office	Institute for Advanced Sustainability Studies e.V. (IASS)
Miranda Schreurs	Council Member	German Advisory Council on the Environment (SRU)
	Chair	Network of European Environmental and Sustainable Development Advisory Councils (EEAC)
Alexander Schuelke	Project Officer	German Federal Environment Agency (UBA)
Jan De Smedt	Executive Director	Belgian Federal Council for Sustainable Development
Will Steffen	Researcher	Australian National University (ANU)
	Council Member	Climate Council of Australia
Andreas Versmann	Sustainable Development Observatory	European Economic and Social Committee (EESC)
Michiel de Vries	Strategic Advisor	Dutch Council for the Environment and Infrastructure (RLI)
	Coordinator	Network of European Environmental and Sustainable Development Advisory Councils (EEAC)

Name	Position	Organisation
Jakub Wejchert	Policy Officer for Global Sustainability	DG Environment. European Commission
Julia Werner	Desk Officer. Division for European Union, Bilateral Cooperation with EU Member States, Officer for European Affairs, European Law	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)
Monica Westernen	Implementation of the 7th Environment Action Programme	DG Environment. European Commission
Katrin Zimmer	International Cooperation Unit	Swedish Environmental Protection Agency

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The **EEAC** is a network of advisory bodies established by national or regional governments. EEAC members offer independent advice to their respective national or regional governments, proposing solutions and new understandings of the critical challenges facing our societies and the planet (www.eeac.eu).

The **CADS** is the advisory body of the Government of Catalonia in relation to sustainable development. Created in 1998, it is an active member of the EEAC network (www.gencat.cat/cads).

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