



Contents lists available at ScienceDirect

The International Journal of Management Education

journal homepage: www.elsevier.com/locate/ijme

Research Notes

The Gap Frame - Translating the SDGs into relevant national grand challenges for strategic business opportunities

Katrín Muff Ph.D. ^{a,*}, Agnieszka Kapalka Ph.D. ^a, Prof. Dr. Thomas Dyllick ^b^a Business School Lausanne, Switzerland^b University of St. Gallen, Switzerland

ARTICLE INFO

Article history:

Received 20 December 2016

Received in revised form 4 March 2017

Accepted 5 March 2017

Available online xxx

Keywords:

True business sustainability

Gap frame

Collaboratory

Sustainable development goals

SDG compass

ABSTRACT

The global agenda of Grand Challenges until 2030 is set: the Sustainable Development Goals (SDGs) enjoy broad global governmental acceptance and increasing business awareness. This paper takes a concrete look at how we can reach a state-of-the-world by 2030 that is 'safe for all of us'. Getting there requires relevant national measures that are easily accessible for business, which is considered a key transformative force with its innovation power. The global nature and focus of the SDGs make it challenging to serve as a relevant source for measuring national progress. This paper offers a solution to this challenge by introducing the Gap Frame; a normative framework built on the SDGs and developed in a multi-step expert-consultation approach. The Gap Frame supports the global SDG by enriching the SDG Compass, a planning tool developed by GRI, UNGC and WBCSD. Building on the SDG Compass, this paper shows how the Gap Frame translates the SDGs into relevant actions for different nations, and how it can be used as a strategic business tool and as an educational tool for business schools.

© 2017 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The **United Nations Sustainable Development Goals (SDGs)** were agreed upon in September 2015 by the global community after an extensive political alignment process among multiple stakeholders including global business and NGOs. The SDGs replace the Millennium Development Goals (MDGs) that served to prioritize the global agenda between 2000 and 2015. For the period 2015–2030 the SDGs now set the new global agenda, with 193 nations having signed up to the 17 underlying goals.

Significant progress that has been made in resolving some of the big issues addressed by the Millennium Development Goals. For example: extreme poverty has decreased from 1.9 billion in 1990 to 836 million in 2015, with most progress having occurred since 2000. The number of child deaths has been reduced from 12.7 million in 1990 to almost 6 million in 2015 globally. ([The Millennium Development Goals Report, 2015](#)) Yet, at the same time, the planet, the state of government, the economy and our societies are in many ways worse off than at the turn of the millennium. Humanity's ecological planetary overshoot has grown from 36% to 64% in the period of 2000–2012 ([Global Footprint Network, 2016](#)). In 2014 the income gap between rich and poor has reached its highest levels in most OECD countries ([OECD, 2014](#)), resulting in increasing dissatisfaction with the economic and political systems around the world. It has become clear that a single player alone, be it

* Corresponding author.

E-mail address: katrin.muff@gmail.com (K. Muff).

government or business or civil society, cannot resolve these increasingly complex global challenges. Much hope rests, however, on the innovation power of business with its far-reaching global presence and influence.

The SDG Compass developed by the Global Reporting Initiative (GRI), the U.N. Global Compact (UNGC), and the World Business Council of Sustainable Development (WBCSD) provides a generic five-step process for business to apply the SDGs for business planning:

- Step 1: Understanding the SDGs
- Step 2: Defining priorities
- Step 3: Setting goals
- Step 4: Integrating
- Step 5: Reporting & communicating

This paper builds on the SDG Compass by enriching it with process knowhow and content expertise in order to facilitate its application in the strategy processes of business and in business school education. This paper will focus on the first three steps, by adding the Gap Frame in step 1, Business Sustainability 3.0 (BST 3.0) in step 2 and the Collaboratory in step 3 as additional tools (see Fig. 1).

Business schools as an educator of the next generation of leaders and partners of business, play an important role in unleashing this innovation power in the coming decade. UNPRME-schools represent a growing group of business schools around the world that endorse this challenge and actively seek to contribute to progress with innovative solutions in research and education. Helping business understand and embrace the opportunity the SDGs provide will be a key priority for business schools in the next decade.

While the Business Sustainability Typology (Dyllick & Muff, 2016) with its BST 3.0 proposition and the Collaboratory method (Muff, 2016) have been used already as tools to help business on their sustainability journey, the Gap Frame is a new tool. It has been developed in parallel with the SDGs and provides a framework with ideal objectives for the different goals where all citizens can live well on one planet. This paper will focus primarily on introducing the Gap Frame as a new tool, while it will only touch on BST 3.0 and the Collaboratory in order to provide a concrete pathway for working with the SDGs.

Section 2 provides a brief overview of the methodology and the systematic process used to develop the Gap Frame. The following three sections illustrate the application of the Gap Frame following steps 1 to 3 of the SDG Compass. Switzerland is used as a case in point. Section 3 outlines step 1 of the SDG Compass on understanding the SDGs, using the Gap Frame. Section 4 focusses on step 2 of the SDG Compass outlining how such a normative framework can help business to define priorities by adopting an “outside-in” perspective to identify long-term white-spot opportunities. Section 5 addresses step 3 of the SDG Compass and outlines how a co-creative multi-stakeholder process serves to translate the SDGs into long-term business opportunities. Section 6 focusses on how business schools might be using these tools and how PRME schools can make a difference in helping companies on their journey towards true business sustainability. Section 7 presents concluding thoughts on limitations and next steps forward.

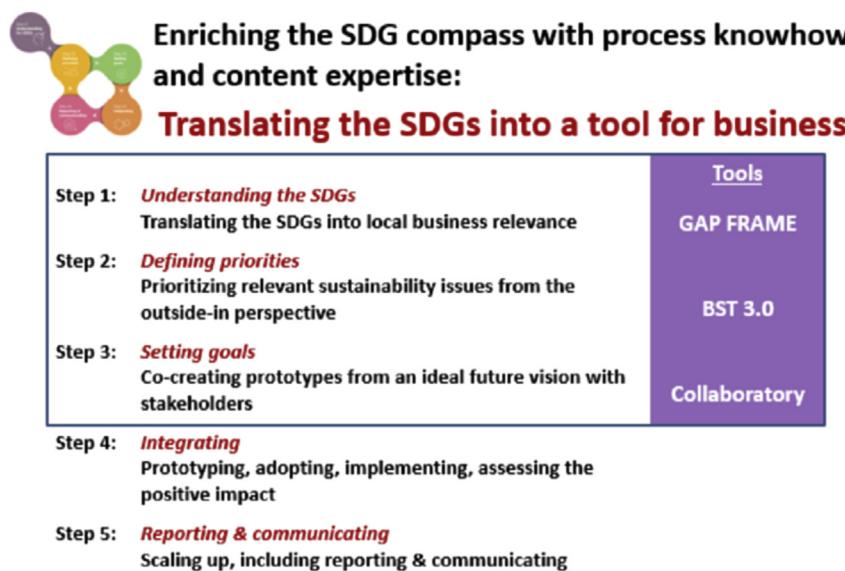


Fig. 1. The 5-step SDG Compass enriched in steps 1 to 3.

2. Developing the Gap Frame

There have been a large number of sustainability frameworks on a national level presented in recent years in order to better manage a country's sustainable development. They have been developed by organizations as different as the U.N., OECD, WEF, Avina Foundation, New Economics Foundation (2006), or RobecoSAM (see Appendix 3). Their emergence and prominence mirror the rapidly increasing importance of the issues and challenges they address. When we take a closer look, however, we realize how different these frameworks are in their approach, with regard to the relevant dimensions and indicators used, but also with regard to the perspectives taken. Many of them use the term "sustainability" to define their model, but they clearly mean very different things. This should not come as a surprise as they are developed by very different groups (governmental organizations, NGOs, scientists, think tanks and consultants) who pursue very different goals. Also, the sustainability concept is still quite young, very general and broad, used in very different ways and it is an evolving concept. Putting some order into these frameworks and their intended goals should help to get a better overview and create a deeper understanding. Based on the Business Sustainability Typology developed by Dyllick and Muff (2016), we distinguish three types of national sustainability:

- **National Sustainability 1.0 (NST 1.0):** These frameworks integrate social, environmental and sometimes governance aspects in varying degrees into their economic assessments in order to come up with a more complete, inclusive or longer-term assessment of countries. Their goal, however, remains purely economic. They are focused on rating the current and future potential for growth, wealth creation or competitiveness of different nations. We consider this a typical inside-out perspective focusing on an enriched focus of a particular nation's economy.
- **National Sustainability 2.0 (NST 2.0):** These frameworks enlarge the relevant goals of national sustainability and include a broad set of measures of well-being, social progress or social development. Many of these frameworks depart from the concern that standard macroeconomic statistics like GDP fail to give a true account of people's current and future well-being and of a country's success in creating different values for its people. Still an inside-out perspective, albeit much broader than NST 1.0.
- **National Sustainability 3.0 (NST 3.0):** The NST 3.0 frameworks change the perspective from inside-out to outside-in. They start out from the outside considering global sustainability challenges as defined by science and politics and measure the contributions by nations, business or civil society actors in reaching these goals. They allow various actors to apply global goals inside their institutional context. A true shift in perspective.

Analyzing 12 well-known national or global sustainability frameworks (see Appendix 3), these can be grouped into the three different types of national sustainability (see Table 1).

Agenda 21 (1992), the Swiss Cercle Indicateurs (2015) and the SDGs (2015) are the three frameworks that use an outside-in perspective to assess the country's contribution to solving global sustainability problems. They address either the global level (Agenda 21 and SDGs) or the regional/city level of action (Cercle Indicateur) and span 25 years of SD thinking. The Gap Frame embraces an outside-in perspective and offers a state-of-the art approach of a NST 3.0 approach that combines the insights of the three relevant NST 3.0 frameworks, prioritizing the SDGs in the process (see Appendix 4 with a detailed comparison of the three NST 3.0 and the Gap Frame issues).

Within the limitations of this paper, the process that has been followed to establish, test, verify, amend and complete the Gap Frame can only be summarized. We will first describe how the SDGs were translated into the Gap Frame and what the Gap Frame is, then we will look at the process used to develop the Gap Frame.

The Gap Frame (Fig. 2) builds on the idea of a "safe operating space" as developed by Raworth (2012). Her model suggests that there is certain safe space within which humanity must operate, considering both outer planetary boundaries (Rockström et al., 2009) as well as certain minimum levels of social requirements (inner boundaries) to ensure that all 9 billion citizens can live well on the one planet we have (WBCSD, 2010). In order to encourage key actors to work together towards moving into such a safe space, it is necessary to assess where we are regarding this ambition in each of the four big

Table 1

Overview of National Sustainability Frameworks ordered by type and year created.

NST 1.0	NST 2.0	NST 3.0
<ul style="list-style-type: none"> - Sustainability-adjusted Global Competitiveness Index (2011) - Country Sustainability Ranking (2013) - Sustainable Competitiveness Index (2013) 	<ul style="list-style-type: none"> - Happy Planet Index (2006) - Sust. Society Index (2008) - Sustainable City Index (2008) - Better Life Index (2011) - World Happiness Report (2012) - Social Progress Index (2014) 	<ul style="list-style-type: none"> - Agenda 21 (1992) - Cercle Indicateurs (2015) - Sustainable Development Goals (2015)

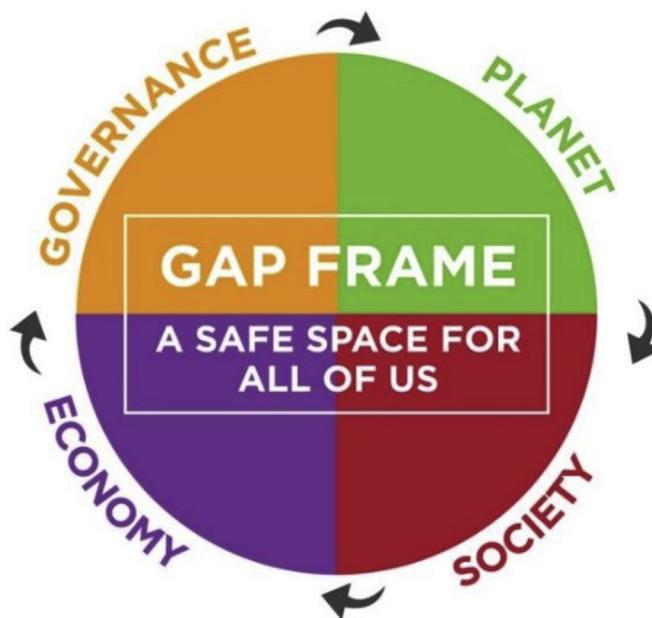


Fig. 2. The Gap Frame – a normative framework for a safe space for all of us (gapframe.org).

sustainability domains: planet (environment), society, economy and governance. Using a 10-point scale with 0 representing the worst value and 10 representing an ideal value, we define the “safe space” at the 80% point (using a range from 75% to 88%) as the space that is sufficient, if indeed achieved across all issues and indicators. Rather than pushing single issues to 100% perfection, it is important to work on those issues that are furthest away from their safe space with the objective to achieve such a “strong sustainability” across all issues and dimensions.

Different scaling measures were tested, resulting in a five-colored list of criteria, based on a ten point scale as outlined in Fig. 3. How good this scale works can only be revealed in the future and the ongoing review of the tool will include adaptations of the criteria chosen should changes become necessary. For the first Gap Frame release, the following five criteria have been defined:

1. **Threat:** Any issue with a score below 5, resulting from the average of the underlying indicators, is considered a burning issue that represents a threat for that country and for humanity: urgent attention and significant improvement are needed to drive change towards the ideal value.
2. **Critical:** Issues with a score between 5.1 and 6.6 are considered as being critical and require urgent action. They are far from the safe space and are harming the well-being of living beings on the planet in one way or another.

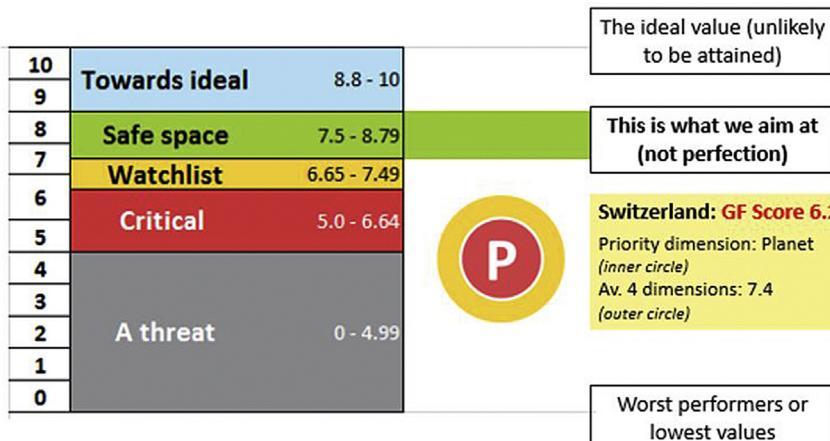


Fig. 3. The scale of the issues and indicators of the Gap Frame (www.gapframe.org).

3. **Watchlist:** Any issue with an average score between 6.7 and 7.4 is considered as being on the watch list. These issues need closer examination to determine if things are moving into the right direction.
4. **Safe space:** Using the logic of the 80:20 principle, we define a range around the 80% mark (from 7.5 to 8.8) which defines what we call a “safe space”. It does not represent the maximum or ideal value of a given issue but it can be considered as “good enough” in the context of the four dimensions used.
5. **Towards ideal:** Any score above 8.8 is considered approaching an ideal state. Following the logic of the 80:20 principle improving beyond the 80% mark requires 80% of all efforts, while reaching it requires only 20% of all efforts. Therefore, it does not seem to be sensible to strive for the last 20% of perfection. We rather want to draw the attention to those issues that need urgent action first (below 6.6).

The Gap Frame includes 24 issues and 68 indicators, averaging about 2.8 indicators per issue. Since the indicators are used both to measure the condition of an issue and to illustrate different aspects of the issue, we have opted not to identify the statistically most relevant indicator by issue, but use as many indicators as available and required to satisfy both applications. For statistical purposes we could have reduced the indicators to about half and still provide a reliable scoring value, however being able to illustrate an issue broadly took priority in our choice. For example, in Switzerland “equal opportunity” is one of the issues where the country does not perform very well (see Table 2). It has proven helpful to be able to point to the fact that Switzerland has an issue with the number of women on boards (score 3.5 of 10), that female representation in parliament is not that great (score 5.3 of 10) and that the gender pay gap and the income distribution are serious issues (global ranks 22 and 24).

Table 2

The four indicators that substantiate the “equal opportunity” issue using Switzerland as an example.

5.2 Equal opportunity in Switzerland	Score	Rank
Gender pay gap	5.4	22
Female representation in parliament	5.3	17
Women presence on boards	3.5	14
Income distribution	6.8	24

We have used data sources that are publicly available (see Table 3):

Table 3

Overview of data sources used for establishing the indicators for the Gap Frame.

Data sources used for the underlying indicators of the Gap Frame	
1. Better Life Index (OECD database)	8. National Carbon Emissions (Global Carbon Budget)
2. Corporate Responsibility Report (KPMG)	9. National Footprint Accounts (Global Footprint Network)
3. Environmental Performance Index (Yale University)	10. OECD database
4. Global Competitiveness Index (World Economic Forum)	11. Sustainability Governance Index SGI (Bertelsmann)
5. Global E-Waste Monitor (United Nations University)	12. Social Progress Index (Avina, Skoll Foundations and Deloitte)
6. Global Terrorism Index (Wikipedia)	13. Sustainable Society Index (Sustainable Society Foundation)
7. Living Planet Report (WWF)	14. Worldbank database

Some indicators themselves represent a composite value or are themselves based on different publicly available sources. Using public data has advantages and disadvantages. The advantage lies in the ready availability of data across a large field globally. The disadvantage of course is the variability of the data quality both across different data sources and across different countries. We recognize these limitations, and concluded that for our purposes the advantages surpass the disadvantages. We do hope and count on a continuous improvement in data quality and shall continue to look for the best possible sources for

our indicators when planning for periodic reviews. There are a number of indicators that we wish we had data for but there is none available at a global level. For example, we would like to include measures of hazardous waste in waste treatment and we would like to consider the well-being of children when we look at the quality of life. Similarly, we would like to include individual meat consumption when looking at sustainable consumption patterns and include fossil fuel subsidies and true cost considerations when looking at sustainable production. In the area of structural resilience, we are missing indicators in the area of speculation and cyber-attacks and we would like to see indicators that allow measuring interstate conflicts when looking at peace & cooperation. For us, business integrity should include government incentives for sustainable and just business practices for which there are no available global indicators yet. The wish list items in [Appendix 2](#) provide further insights.

The Gap Frame offers two different national measures: The “lowest score” is the official Gap Frame Score while the “average result” serves to complete the picture:

1. The **lowest score** is the score of the lowest dimension among the four dimensions (planet, society, economy, governance). Used for the Gap Frame score, it allows highlighting immediately where focus and urgent action are needed. At this point, no single country has all of its dimensions in the “safe space”. Even the top four countries in the world (3%) are placed on the “watchlist”, meaning that they have a dimension that is not yet in the “safe space”, requiring more work. It is noteworthy, that according to this “strong sustainability score”, nearly half of the countries (75 countries or 48%) have a dimension with burning issues that represent a threat to the well-being of all of us. We consider this a realistic assessment of the current state of the world.
2. The **average result** is calculated using the average score of the four sustainability dimensions. Naturally, it shows a better global picture that may result in a sense of relative comfort that seems inappropriate to us at this point. Of the 155 countries that have a complete dataset, 24 countries (15%) are doing well with 4 countries in the safe space and 20 on the watchlist. 19 countries (12%) have burning issues (threats) that require urgent action, although another 112 countries are below the minimum requirements for the safe operating space (critical).

Experts suggest that average results promote a “weak” understanding of sustainability whereby one dimension could easily be sacrificed in favor of another (e.g. the environment at the expense of economic concerns). Using the lowest score instead ensures focusing on the sore spot and promotes a “strong” understanding of sustainability. This is precisely the purpose of the Gap Frame: to highlight the biggest gap for a country to focus on. We anticipate that only this can motivate a country to quantum leap from where it is to where it needs to be. We thus provide an average country result only as an additional reference point but do not use it for our Gap Frame ranking.

Looking at Switzerland highlights the difference of the two measures:



- The **lowest score** places Switzerland with 6.2 on place 16 in the global ranking with its lowest value dimension (planet) at a critical level (red). For Switzerland, this means: more than anything, critical attention is needed in the area of the environment (planet).
- The **average result** puts Switzerland with 7.4 on the watchlist and on the 5th place globally, while the four best countries are in the safe space. Despite the fact that Switzerland could do even better and move up to the “safe space”, being placed on the “watchlist” may not trigger much urgency for action.

These two different measures are of critical importance for Switzerland in order to mobilize action among business and other stakeholders on their journey towards a globally safe space.

Developing the Gap Frame has been a yearlong co-creative process involving expert reviewers at various stages. What we discussing here is a first launch version that has matured out of the initial Beta Version of March 2016. Further amendments are anticipated and an ongoing and regular review process with experts is anticipated. A first large circle expert review of the Gap Frame is anticipated and planned for 2018, a year after the Gap Frame data was first compiled and made public. A bi-

annual revision is envisaged with an updated Gap Frame and new data including trend analysis and systems analysis in 2019. Here is an overview of the steps involved in developing the Gap Frame to date:

Step 1: Compilation of the indicators and underlying measures of the three existing National Sustainability Typology (NST) frameworks, namely the Sustainable Development Goals the Agenda 21, the Swiss Cercle Indicateur, followed by a comparative analysis of these frameworks.

Step 2: A detailed review and analysis of relevant national sustainability frameworks, in particular those 12 covered in the NST assessment, with the purpose to identify further indicators to complement the three NST 3.0 frameworks. The result was a long-list of 200 indicators and 24 issues.

Step 3: An independent researcher compiled the data of the long-list for one sample country (Switzerland) for all 200 indicators across the 24 issues, differentiating between hard and soft data and establishing a first basis for a quantitative assessment and comparison of the data.

Step 4: A first expert peer review assessed the data, removing obvious overlaps and triaging data sources for quality and global availability, reducing the long-list to 160 indicators.

Step 4: A review of the data for statistical independence ensured that we are not measuring the same thing through similar indicators. This assessment reduced the indicators to 120 items.

Step 5: Using the country data of the Social Progress Index, a representative sample of 14 countries was selected covering all stages of development.

Step 6: A second expert peer review assessed the 120 indicators across this global sample and attempted a first balancing across the issues and categories, reduced the indicators to 90, and highlighted potential gaps.

Step 7: One co-author collected the data for the 90 indicators and 14 countries from the previously established public data sources and calculated initial OECD and world values.

Step 8: The raw data were calibrated and adjusted, using standard statistical data reversal methods, in order to translate the various source data in order to develop a scale from 0 to 10 with 10 representing an ideal value.

Step 9: A third expert review verified and determined the ideal values for all indicators. Some indicators had to be rejected as there was no ideal value (example: there is no ideal value for the number of species in any given country), reducing the indicators to 73.

Step 10: The 73 indicator data points for the 14 countries were scaled against the ideal value (= 10) and the worst value in the sample (= 0).

Step 11: A fourth expert peer review approved the 69 indicators of the Beta Version against five validity criteria:

- a) data comes from a reliable, publicly available, open source
- b) data is available both in terms of historic and anticipated future values
- c) data set is available at sufficient breadth, ideally beyond but at least covering the OECD
- d) data within any issue combines indicators that are relevant for countries across all stages of development (least developed, developing and developed countries)
- e) data allowed to be measured against an ideal value and generated no unintended misinterpretation of users.

Step 12: A white paper was written analyzing and contextualizing the data sample of the Beta Version. It was shared with a larger group of experts who had knowledge in the many specific dimensions of the involved themes. These experts reviewed and commented the data, methodology, interdependencies, overlaps, assumptions, intentions and ambitions in a 6-months process.

Expert Panel (17 detailed reviews)

Andreas Hauser (Swiss Federal Office of the Environment & Nature FOEN), Mathis Wackernagel (Global Footprint Network), André Schneider, Bruno Oberle, Lorenzo Massa and Albert Merino-Saum (EPFL Switzerland), Mathias Binswanger (FHNW Switzerland), Mark Halle und Laslo Pinter (IISD), Sally Jeanrenaud (University of Exeter, UK), Basil Bornemann (University of Basel), Thomas Dyllick (University of St. Gallen), Christian Kobler, Doris Hauser and Antoinette Hunziker-Ebneter (Forma Futura), Eckhard Plinke (Vescore), Alexander Barkawi (Oikos Foundation).

Step 13: In parallel, the Gap Frame tool was prototyped in connection with the True Business Sustainability Typology ([Dyllick & Muff, 2016](#)) and tested in a sequence of workshops with representatives from three different industries: food, energy, and banking.

Step 14: The Beta Version was entirely overhauled and improved in the following areas: a) the country total was replaced by a ranking of the lowest score to prevent weak sustainability thinking, b) the biodiversity indicator was developed bottom-up with the IUCN research center, c) the climate issue was replaced by a carbon quotient indicator that was developed internally based on existing data, d) the governance issues and indicators were entirely revised and restructured using an input, process, output logic, d) replacement and improvement of a variety of indicators and issues resulting

in changed terminology, e) a systematic approach to the calibration of data in accordance with strict principles, f) the U.N. definition for regions of the world was selected for additional granularity of data. This resulted in the final list of 24 issues and 68 indicators. There are still a dozen indicators on the wish list for future data measurement (see [Appendix 2](#)).

Step 15: Data collection for 196 countries across the 68 indicators and data transformation, calibration and scaling on our 0–10 scale.

Step 16: Determination of a minimum amount of data to be included in the Gap Frame at the indicator, issue and dimension levels, resulting in solid data for 155 countries across all regions of the world.

Step 17: A fifth expert team review of the initial data analysis and conclusions based on the data set (current values only, no historic data collection completed yet) in preparation of the public launch of the framework. Identification of future needs for analysis in the area of systems thinking and interconnectivity of indicators and issues, both within and beyond the different dimensions.

Before we look at how a business may use the Gap Frame to identify strategic opportunities, let us glimpse at what the Gap Frame tells us in terms of country-by-country performance. We were curious how countries fare when comparing their state of development with their sustainability performance as generated by the Gap Frame. [Fig. 4](#) shows an overview of the 155 countries for which the Gap Frame has a complete dataset to generate a Gap Frame score. On the x-axis, we use the Sustainable Progress Index with the three ranges of development: least developed countries (blue squares), developing countries (red circles) and developed countries (grey triangles). The two axes represent the Gap Frame score (y-axis) and the Social Progress Index (x-axis). There is an indication that the less developed a country is the more threatening issues it is facing, which prevent all of us from being in a safe space. Yet development itself is not the answer, as none of the most developed countries is in the safe space with all of their sustainability dimensions.

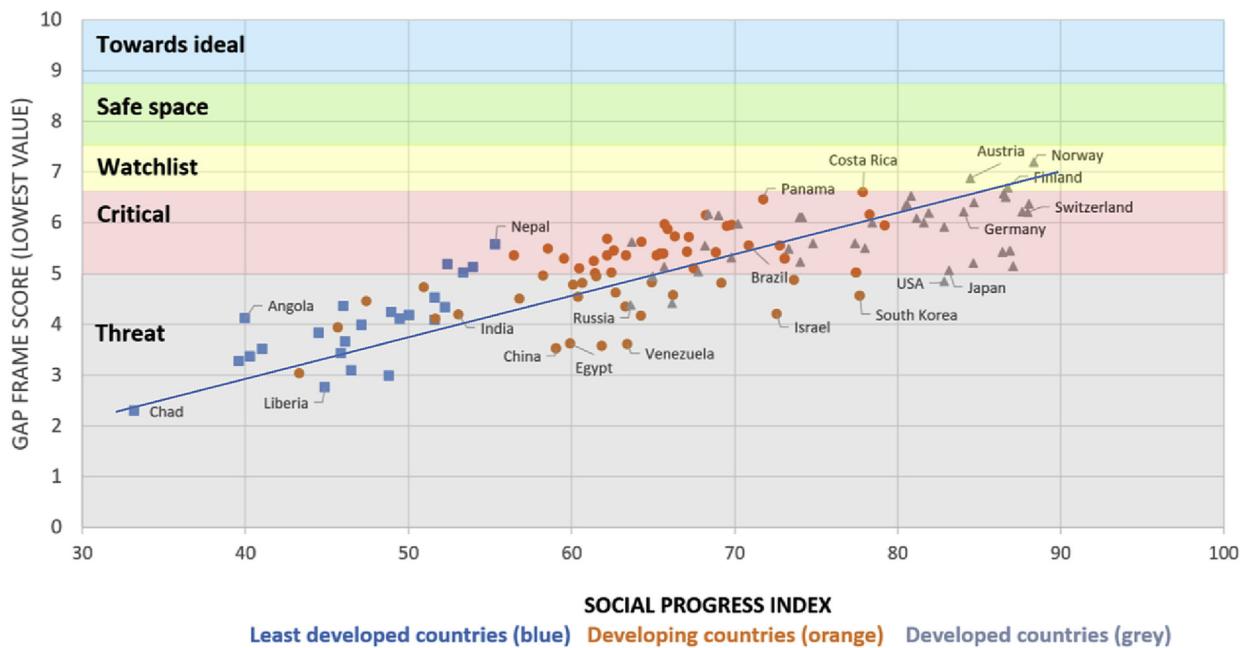


Fig. 4. The Gap Frame: relationship between development and progress towards safe space.

Looking at individual countries, we see that an increasing level of development seems to be positively correlated with an increasing ability to address the sustainability issues. Northern and Western European countries (Norway, Finland, Austria) do best, while other developed countries such as the USA and Japan are negative outliers. The Central American nations and in particular Costa Rica and Panama are positive examples among developing countries, while China, Egypt, Venezuela, South Korea and Israel are lying way behind and contribute negatively to the global situation. Among the least developed countries, Nepal is a positive example, while Liberia is a negative outlier.

Let us have another look at the sustainability performance of different nations and the crucial role of a strong sustainability approach. First reports on how different nations rate with regard to the 17 SDGs indicate that developed countries score very well with North America, Europe and Australia achieving 70% or more of the SDGs already in its first year ([SDSN, 2016](#)). These results suggest that the focus on SDG-related action is put on the developing and least developed countries of this world, and in particular on Africa and the Indian subcontinent as can be seen very well in [Fig. 5](#). This initial assessment raises the question if such an assessment is realistic given the state of the world. The [Footprintnetwork \(2016\)](#), for example, points out, that all but one of the top 20 countries in this assessment have an ecological footprint of over 5 gha per person compared to 1.7 gha

per person available globally. This points to the fact, that the “good” performance of the highly developed countries seems to be based on an extraordinary high use of the globally available biocapacity. This concern highlights the need for a strong sustainability approach rather than a weak sustainability approach, preventing that one weak sustainability dimension can be compensated with a strong dimension. In other words, it should not be allowed to compensate an extraordinary and critical use of natural resources with good governance or wellbeing of the same country.

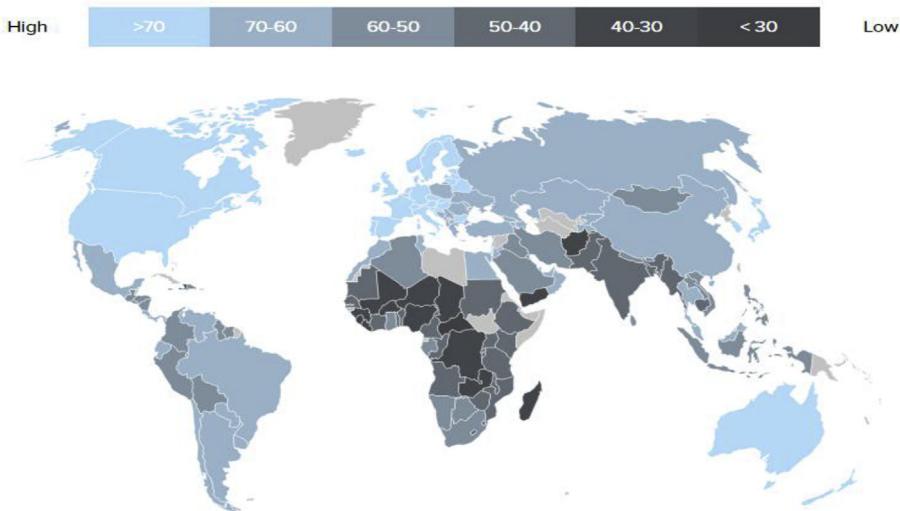


Fig. 5. The SDGs country performance – with lighter colors signaling higher achievements with regard to the SDGs, and darker colors lower achievements (sdgindex.org by SDSN, 2016).

A strong sustainability, as used in the GapFrame, requires that every country moves all its indicators across all four sustainability dimensions into a safe space for all of us. This can be seen well in Fig. 6, which shows a very different picture with regard to the sustainability performance of nations based on the GapFrame results. It provides a distinctly different perspective, highlighting the fact that burning issues that represent a threat to humanity are as prevalent in the developed, the developing and the least developed countries. Only a couple of Scandinavian countries and Austria are above a critical state, while the large majority of all countries are in a critical state or pose even a state of threat. Fig. 6 illustrates the underlying need for the Gap Frame, namely to provide clarity – country by country, region by region – about the size and extent of the challenge to get us from where we are today to where we need to be so that all of us can live well on the one planet we have.

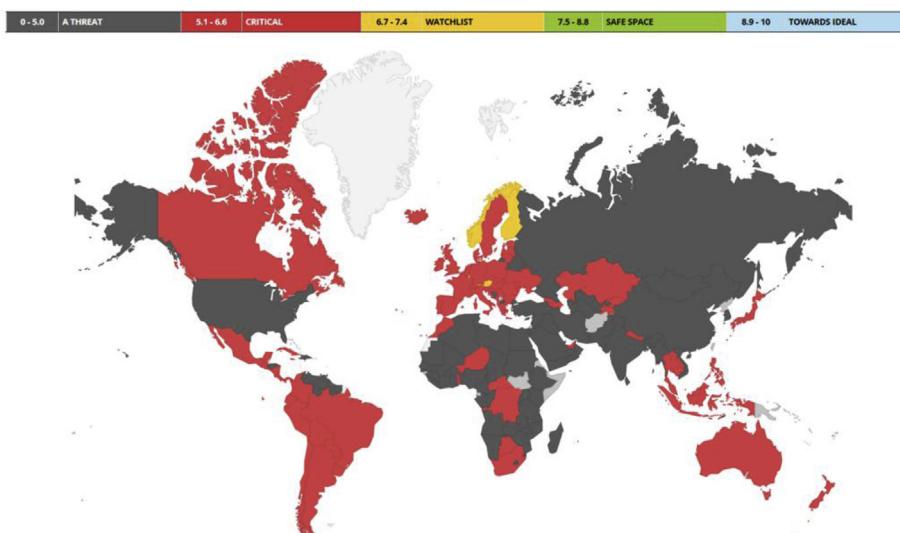


Fig. 6. The Gap Frame country performance using the lowest score assessment – with darker colors signaling a higher urgency for action to ensure that we advance towards a globally safe space (www.gapframe.org).

While the data is available for 155 countries (see [gapframe.org](http://www.gapframe.org)) it is interesting to look at the different regions of the world. Europe occupies the top 3 ranks using the Gap Frame lowest score method, with Western and Northern Europe being either on the watchlist or in the safe space in the society, governance, and economy dimensions. While North America does relatively well in terms of societal, and economic issues, it performs miserably in terms of the dimension planet, being ranked after its South American neighbors. While planet-related issues dominate the priority list in Europe, North America and large parts of Asia as well as the Middle East; the Indian sub-continent, Eastern Asia as well as much of Africa suffer from burning governance-related issues. East and West Africa suffer most from societal issues well reflected in the SDGs. In other words, while the OECD countries need to most urgently address planetary issues, the world overall suffers most from societal and governance issues.

3. SDG compass step 1: understanding the SDGs - with the Gap Frame

Once the Sustainable Development Goals (SDGs) have been adopted as the Global "Agenda 2030" by the U.N. General Assembly in September 2015, the United Nations Global Compact (UNGC), the World Business Council for Sustainable Development (WBCSD) and the Global Reporting Initiative (GRI) adopted these them as the unifying call for business to serve society. Any business conversation about creating a better world must thus embrace these SDGs as a starting base.

The 17 SDGs are global goals with the aim of "leaving no one behind", addressing primarily (but not exclusively) social issues in the global South. Existing data demonstrate that developed nations fulfil many if not most of the SDG already today (see [Appendix 1](#) for Switzerland). Yet, the ecological footprint of the highly developed countries is anything but exemplary for developing countries. If the world lived like the United States, we would need five planets, if it lived like Europe, we would need three planets, creating a highly unsustainable situation globally – quite the opposite from what is required to create a safe space for all of us.

The Gap Frame addresses these shortcomings by providing a national assessment of where each country is compared to where it should be regarding these goals. Translating the SDGs into the Gap Frame involved a number of translation steps ([Fig. 7](#)):



Fig. 7. The Gap Frame: translating the 17 SDGs into 24 issues relevant to all nations and to business (www.gapframe.org).

First, the Gap Frame categorizes the 17 SDGs into four sustainability dimensions (planet, society, economy and governance).

Second, where needed global goals were adapted and completed in order to become relevant and measurable for every single country (details of the methodology are available on [gapframe.org](#)).

Third, three issues were added to the governance dimension (business integrity, public finance, transparency) which are either missing or underrepresented in the SDGs. One issue each is added to economy (resource use), society (social integration) and planet dimensions (clean air). Further, the SDG Goal 12 (sustainable consumption and production) is divided into two separate issues given the relevance and impact of each, particularly for business.

Third, the resulting 24 issues are substantiated with 68 indicators all of which are selected and tested for the requirement to be measured with an ideal and a worst value, using publicly available data (see [Appendix 2](#) for an overview of all issues and indicators).

Fourth, the data is compiled for 197 countries, resulting in complete datasets for 155 countries, allowing a calibration of the current values against ideal values.

Fifth, in the future trend data will be collected to allow for an assessment of how a country will be evolving over time.

The resulting 24 issues in the four extended sustainability dimensions are:

Let us look at Switzerland as an example. [Fig. 8](#) provides a summary overview of the 24 issues of the four Gap Frame dimensions. Switzerland performs exceptionally well in three issues: water (dimension planet), living conditions (dimension society), and resources use (dimension economy). As highlighted in the previous section, the average result of all four dimensions would place the country among the top 5 countries with a value of 7.4, at the upper edge of the watchlist. When looking at the dimension that needs most attention, we can see that “planet” is at a critical state (red) with a score of 6.2 (Gap Frame Score). [Fig. 6](#) highlights the priorities for Switzerland in a quick overview: 1) reducing its carbon footprint as expressed in its negative carbon quotient, 2) reversing its unsustainable levels of consumption (import of “stuff”), 3) addressing its deteriorating biodiversity, 4) ensuring equal opportunity, 5) embracing clean energy, 6) reducing the phosphate use in agricultural production to improve its contribution to the dire state of the oceans, 7) further advancing in the implementation of renewable energy, and 8) improving the recycling rate of electronics in solid household waste. While Switzerland does provide a safe space in terms of its societal, economic and governance dimensions (all in “green”), the Gap Frame suggests that the country’s performance in terms of the planet is lacking (“red”). The Gap Frame also shows that working on improving living conditions, resources use or water quality and availability is not a priority for the country (all close to an “ideal state”).

When comparing the assessment in [Fig. 8](#) with the SDG assessment by the Sustainable Development Solutions Network (SDSN) ([Fig. 9](#)), we discover an important and insightful difference. While the Gap Frame provides us with a clear list of priority issues to solve, the SDG results suggest that the country does very well, and that Switzerland should focus on SDG goal #17, namely developing better partnerships to implement the global goals, rather than its environmental issues (as the Gap Frame suggests).

If a business wants to understand the important sustainability issues for the region in which it operates, the Gap Frame provides a clear answer. Offering data for 20 world regions and 196 countries (for 155 countries with a complete data set across all dimensions), [gapframe.org](#) allows generating easy and quick data sorting and analysis. For a Swiss business we have identified in this section the eight most important issues to consider. Let us now look how a business can translate these issues into real long-term business opportunities.

4. SDG compass step 2: defining priorities - with BST 3.0

What is thus needed to turn these priority issues into real business opportunities? This section outlines the concept of True Business Sustainability, which may well explain why business organizations have not yet seen the kinds of benefits they had anticipated by investing in sustainability over the past decade. Most sustainability efforts to date have focused on what [Dyllick and Muff \(2016\)](#) call an “inside-out” perspective, rather than the radically different “outside-in” perspective of “true business sustainability”. The Business Sustainability Typology outlines this fundamental difference in three types of business sustainability:

- BST 1.0 is a refined shareholder value model where companies consider sustainability as an enabler to improve their economic performance (*inside-out* perspective).
- BST 2.0 reflects a triple-bottom line approach where companies measure the value they create for a broader set of stakeholders and the three dimensions of sustainability, i.e. economic, social & environmental value (still *inside-out* perspective).
- BST 3.0 introduces an issue-centered perspective where a company addresses big sustainability challenges and applies its resources, competencies and innovation power to contribute to resolve them (*outside-in* perspective).

[Dyllick and Muff \(2016\)](#) suggest that a shift in perspective from “inside-out” to “outside-in” will not only lead to business being celebrated as a source for public good, but will allow business to fully reap the benefits of sustainability. While current

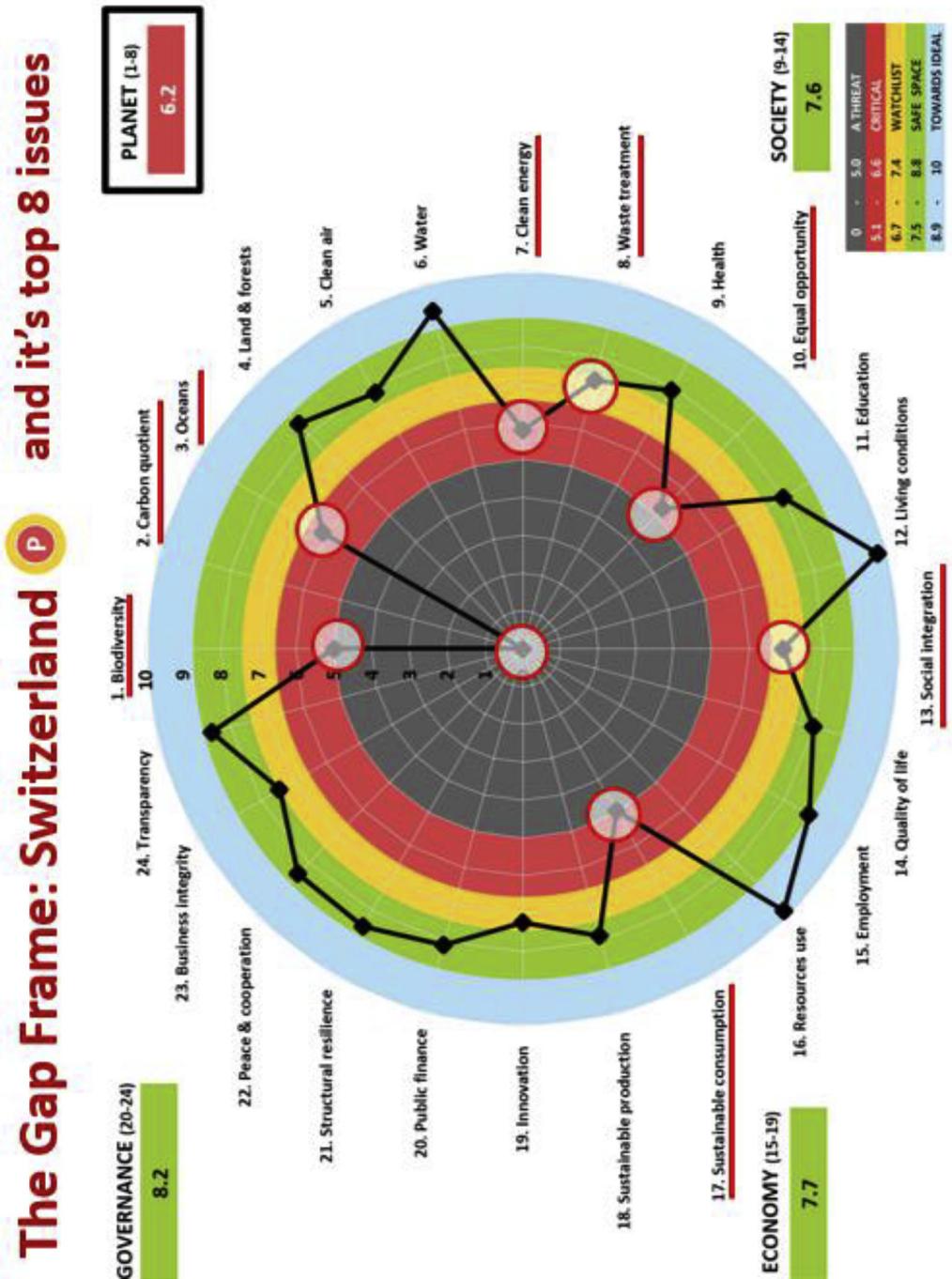


Fig. 8. The critical eight priorities for Switzerland provided by the Gap Frame (www.gapframe.org).

AVERAGE PERFORMANCE BY SDG

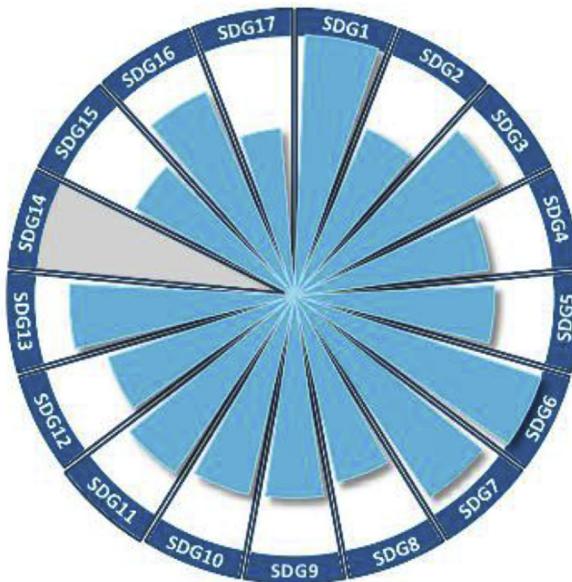


Fig. 9. The [SDGindex.org](#) assessing Switzerland against the SDGs and other indicators ([SDGindex.org](#)).

“inside-out” efforts might well protect business in the short term, it does little to embrace a business’ long-term viability or solve the various sustainability issues in the world.

The Gap Frame provides a starting point for an “outside-in” perspective by highlighting the most critical issues in a country or region in the domains of environment, society, economy and governance. Business and multi-stakeholders can thus refer to the Gap Frame analysis to cooperate in translating these issues into long-term white-space business opportunities that [Dyllick and Muff \(2016\)](#) call true business sustainability (see [Table 4](#)).

Using Switzerland as an example and the previously identified eight critical issues for the country, multi-stakeholders at a Swiss food industry workshop have identified the following strategies that can illustrate the difference of an inside-out and outside-in perspective ([Table 5](#)). While inside-out strategies focus on reducing the footprint of the existing business, the outside-in perspective considers entirely new fields of business activities in each of the eight priority issues of Switzerland, using different capacities of players in the food industry.

Table 4
The 24 issues in the four dimensions of the Gap Frame.

Planet	Society
1. Biodiversity	9. Health
2. Carbon quotient	10. Equal opportunity
3. Oceans	11. Education
4. Land & forests	12. Living conditions
5. Clean air	13. Social integration
6. Water	14. Quality of life
7. Clean energy	
8. Waste treatment	
Economy	Governance
15. Employment	20. Public finance
16. Resource use	21. Structural resilience
17. Sustainable consumption	22. Peace & cooperation
18. Sustainable production	23. Business integrity
19. Innovation	24. Transparency

Table 5

Illustrating the difference of an inside-out and outside-in perspective.

Example: Food Industry in Switzerland
(multi-stakeholder workshop organized by the Swiss Sustainability Hub in spring 2016)

Country priority issues	Inside-out (risk/opp current bus.)	Outside-in (white-space future opportunities)
1. Carbon quotient Carbon footprint relative to net bio-capacity available after farming		Reducing meat production to reduce CO2 footprint
2. Sustainable consumption Carbon consumption (incl. import), energy savings (over time)	Further reducing energy use in production	Favoring local & seasonal products in offer
3. Biodiversity Extinction rate of animals, protected terrestrial habitat areas		Replacing sugar with local honey
4. Equal opportunity GINI, gender wage gap, women presence in boards and parliament	Becoming an equal pay company	Role-modeling women's contribution to decisions
5. Clean energy Renewable energy, domestic use of solid fuels	Shifting to renewable energy in production	Promoting renewable energy along entire value chain
6. Oceans Fish stock, phosphate consumption relative to cultivated land		Eliminating phosphor in agriculture
7. Social integration Integration, minority discrimination		Training for refugees Recipes from immigrants
8. Waste treatment Recovered/recycled solid municipal waste, waste water treatment	Increasing internal recycling	Replacing plastic in packaging, eliminating packaging

Example: Food Industry in Switzerland (Multi-stakeholder workshop organized by the Swiss Sustainability Hub in spring 2016).

When trying to better understand what is behind the 24 Gap Frame issues, the Gap Frame offers a further level of granularity. It substantiates the 24 issues with underlying indicators, all of which are measured against an ideal value. Let us look at what this means for the world as compared to OECD countries. Fig. 10 shows what the world's five priority issues are: waste treatment, social integration, innovation, clean energy, peace & cooperation. They are closely followed by structural resilience, land & forests, business integrity, and transparency. These issues are spread out across all four dimensions. It is to be noted that we don't have data for equal opportunity, quality of life, resources use and sustainable production; any of these issues may or may not be a world priority as well.

For the OECD the four top priority issues are as follows: carbon quotient, oceans, equal opportunity, and waste treatment. These are followed by: biodiversity, clean energy, social integration, public finance, sustainable consumption, land & forests, quality of life, and innovation. We are not aiming to decide which of these issues are more or less important, but we are showing where the world and the OECD are as compared to where they should be in each of these issues. We have thus identified the issues where the need for change is greatest in order to reduce the gap between the current state and the desired future state ensuring a global "safe space".

Beyond providing comparative data for countries and regions, the Gap Frame enables an issue-based focus and index. Such issue-centered data provide an excellent tool for sectors, industries or individual business (and other) players to better understand and guide their actions in the sustainability field so that we are approaching a global safe space. Let us illustrate this point by considering a select number of issues in the "society" dimension. The Gap Frame suggests that in terms of "health", which is measured by child survival, sufficient food, obesity rate and alcohol abuse, Singapore can be considered a best-practice example globally. If we consider "living conditions", which are measured by access to electricity, access to an improved drinking water, safe sanitation and safety on the road, most European countries do extremely well. In terms of "social integration" countries like Iceland, Sweden and Ireland stand out. It may well be useful for decision-makers of other countries to learn from such best-practice cases when considering its own long-term strategy for an issue. Table 6 completes the issue-centered perspective by indicating the leading countries in each of the four sustainability dimensions (e.g. planet, society, economy and governance). As outlined earlier, a score of 7.5 or higher is considered as a "safe space for all of us", which many of these countries achieve (exception: planet) and thus offer a diverse range of potential interesting best-practice cases to study, evaluate and share.

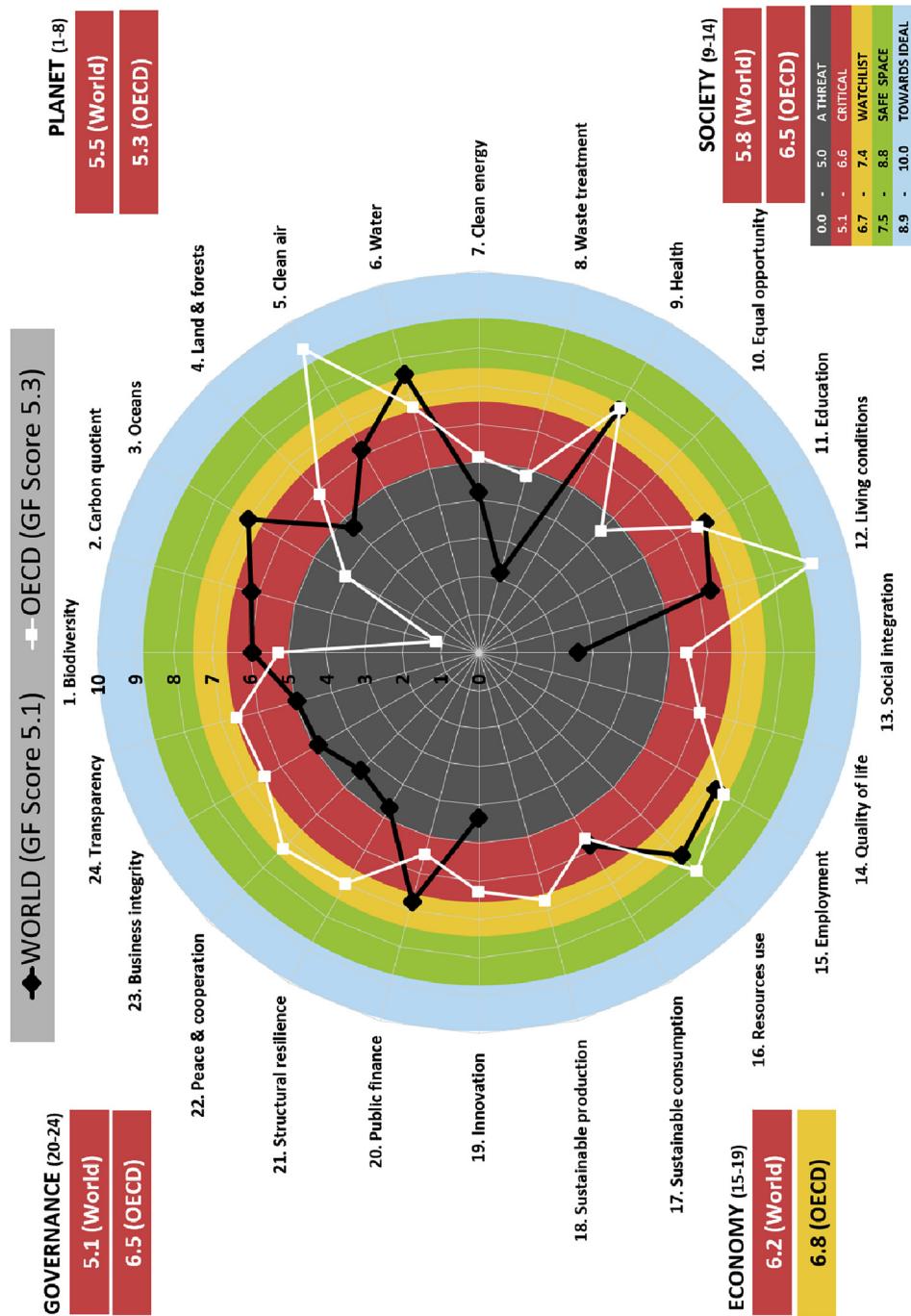


Fig. 10. Comparing the state of the world vs. OECD countries (gapframe.org/).

Table 6Best-practice country examples for the four sustainability dimensions ([gapframe.org](http://www.gapframe.org)).

PLANET			SOCIETY		
Rank	Country	Score	Rank	Country	Score
1	Latvia	8.0	1	Norway	8.2
2	Antigua & Barbuda	7.5	2	Sweden	8.1
3	Norway	7.4	3	Iceland	8.0
4	Estonia	7.3	4	Finland	8.0
5	Belize	7.3	5	Netherlands	8.0
6	Dominica	7.3	6	Singapore	8.0
7	Zambia	7.3	7	Denmark	7.8
8	Uganda	7.2	8	Malta	7.7
9	Bolivia	7.2	9	Uruguay	7.7
10	Cameroon	7.2	10	Belgium	7.7
ECONOMY			GOVERNANCE		
Rank	Country	Score	Rank	Country	Score
1	Sweden	7.7	1	New Zealand	8.8
2	Switzerland	7.7	2	Finland	8.5
3	France	7.7	3	Denmark	8.4
4	Austria	7.7	4	Norway	8.3
5	Cuba	7.5	5	Sweden	8.3
6	Finland	7.5	6	Singapore	8.2
7	El Salvador	7.4	7	Switzerland	8.2
8	Japan	7.3	8	Luxembourg	8.0
9	Germany	7.3	9	Australia	8.0
10	Costa Rica	7.3	10	Estonia	7.8

In order to put the potential of the data generated to good use, a specific website has been set up allowing everybody to use, filter, and analyze the data (www.gapframe.org). We hope that the Gap Frame inspires not only a sense of urgency but allows also a clear focus for countries deciding on their priority areas to contribute towards a safe space for all of us on this one planet we share. We also hope that the Gap Frame allows the identification and celebration of those emerging best-practice examples of countries that have not only managed to do well in one, two or three of the dimensions, but indeed across all four dimensions of sustainability, demonstrating that it is indeed possible to thrive by respecting the planet, society, economy, and governance.

5. SDG compass step 3: setting goals – using the collaboratory

The global goals identified the SDG agenda and the issues highlighted by the Gap Frame represents the starting basis for multi-stakeholder processes that are needed to resolve these often highly complex Grand Challenges. History shows that wicked problems like hunger, poverty, inequalities or climate action cannot be solved by studying the problem – a new approach is required to find solutions.

In order to achieve the paradigm change that is required, we need solid and reliable multi-stakeholder processes that use back-casting methods starting with an ideal future vision that is then prototyped back to our current reality. Otto Scharmer presents a viable approach with his theory U and U.lab ([Scharmer, 2016](#)). Such methods require positive future visions which cannot be found in the SDGs. “No poverty” (SDG #1) or “Zero hunger” (SDG #2) do not say what a village, city or region will look like when there is an absence of poverty or hunger. What does such a quality of life entail?

A solid understanding of what we are striving for and what future we want for all of us is critical as a foundation to subsequently engage with those stakeholders that can make the biggest difference to get us there. These stakeholders are business, in addition to civil society, social entrepreneurs and governmental or non-governmental actors. Our own research with the Collaboratory that embeds a large variety of co-creative approaches, including Otto Scharmer's presencing method, provides an overview over such methods, what they look like and what they can do (Muff, 2014).

The challenge is thus to translate the global goals of the SDGs into relevant issues for every nation in order to enable business to collaborate with other stakeholders to engage in solving these grand challenges in a co-creative way. The contribution of the Gap Frame lies exactly in this space: it offers a pragmatic translation of the SDGs into issues that are relevant for every nation. And it suggests an ideal future that can be compared to where every nation, region or the world stands, highlighting the gap that needs to be closed. Introducing ideal values is as bold as it is tricky and demands an ongoing effort to check and improve these values and how they are measured. The Gap Frame measures where a country is on its journey to secure a safe space for all of us and it highlights the dimension and the issues where a nation shows the biggest gap and thus pinpoints the concrete areas of action for each country. The tool builds on and extends the outside-in perspective developed by Dyllick and Muff (2016) to define the meaning of "true business sustainability" – or Business Sustainability 3.0. It allows business to define their relevant issues in different geographic markets and to assess its key competencies and strengths in order to effectively address these issues.

As outlined in step 13 of the methodology presented, we have tested the Gap Frame as a tool in multi-stakeholder Collaboratory workshops – predominantly consisting of business practitioners – to better understand its applicability for developing the outside-in perspective. We conducted the following sessions at three levels of business:

1. in a concrete business consultation exercise (1 day)
2. in two industry Collaboratories of 1.5 days each (food and banking industry)
3. at a sectoral level for 0.5 days (the Swiss energy sector).

The industry and sector workshops (levels 2 and 3 above) attracted relevant key players to come and discover this new approach. The underlying idea is the following: imagine that an industry starts by identifying potential contributions to solving burning issues and that individual players in each industry then launch a strategic process to identify and map new "white spot" opportunities. These emerge from combining needs related to specific burning issues and their own core competencies, resources, capacities and talents to solve these needs, possibly in entirely new ways. Such ways will often include unusual new partnerships across sectors and beyond business. These "white spot" innovation opportunities serve as future business units of a given corporation and ensure the long-term economic viability of the business. New products and services will be perfectly aligned with the emerging trends and burning issues that demand solutions.

For this, the Swiss Sustainability Hub – a multi-sector initiative in Switzerland – has defined a multi-step process to enable these industry and business strategic processes. Phase 1 is called the "**Positive Impact Framework**" and builds on the Gap Frame. It is best done on an industry level. Phase 2 is called the "**Collaborative Action Space**" and comprises a series of follow-up steps. They include the Collaboratory methodology that a particular company engages in to further clarify and develop their particular "white spot" innovation opportunities. This happens in collaboration with relevant cross-sectoral stakeholders and results in actionable and measurable strategic goals. Early results appear promising and deserve more attention and research to be fully understood and analyzed.

6. Applications to business education

The Gap Frame identifies a "safe space for all of us" and serves as a basis for multi-stakeholder coalitions to address relevant global challenges. This can be done by sector, across industries, for an enterprise or as a responsible management educator. It has been defined as a tool for business strategy development in the sustainability field so far. But how can it be put to use in an educational context? Beyond first order changes (bolt-on solutions) simply by adding a course or module featuring the Gap Frame, BST 3.0, the Collaboratory or the enriched SDG Compass process tool, we want to focus on applications in the area of second order (built-in solutions) and third order (platform solutions) changes (Muff, 2013):

Second order change: built-in solutions

1. The Gap Frame as a tool to frame and understand the Global Goals as defined by the SDGs
2. The True Business Sustainability typology (BST 3.0) as a way to re-define long-term opportunities for business that directly connect to external social, governance, environmental and economic issues
3. The Collaboratory as a process tool to include multi-stakeholders in prototyping ideas derived from an ideal future, resulting in measurable goals for business
4. The SDG Compass enriched by the above three methods representing a long-term strategy tool for business

Third order change: platform solutions

5. Integrated teaching & learning, and research applications that combine a number of tools into a broader platform solution at the school, program or course level
6. Integrated applications of the Collaboratory for industry-wide solutions across business schools regionally and globally

First, the **Gap Frame** can be used in individual courses, as follows: the Gap Frame can serve to illustrate global issues in the context of a macro economics class. It can be used to involve students from around the world to identify the problems of their home country and to comment on the top 5–10 priority issues as a way to better understand different economies and states of economic development around the world. The Gap Frame can be used in a business ethics class to discuss questions of morality in the context of conflicting issues (e.g. environmental deterioration vs. economic growth) considering best and worst country examples.

Second, the **True Business Sustainability** typology can be used as a tool in strategy courses when looking at how to identify shared value strategies for a given business. At the University St. Gallen, the typology is used as a framework in a Master's course on Sustainability Management and serves as a tool to assess sustainability strategies. Students increasingly use the typology in their Master's or PhD theses to assess the sustainability impacts and performance of companies.

Third, the **Collaboratory** methodology can be used in a variety of ways both in the teaching and learning context as well as in community outreach and faculty engagement. A rich variety of applications is outlined in the book „The Collaboratory“ (ed. Muff, 2014). At Bentley University, the Collaboratory is used to increase student involvement (Buono, 2014). At the University St. Gallen a 13-week Master-level course has been developed in such a way that students lead a multi-stakeholder innovation lab focused on specific local sustainability issues (Dylllick & Muff, 2014). At Business School Lausanne, the Collaboratory is used as a tool to connect with the local community by issuing calls to stakeholders around burning local issues (such as reducing consumer food waste, debating the benefits of a basic income, etc.). At Exeter University, the collaboratory serves to create connections and conversations among faculty and across disciplinary boundaries (Bagnall & Hickman, 2014).

Fourth, the **enriched SDG Compass** can be used in a business strategy class as a pathway to translate the SDGs into concrete business opportunities. Also, in response to the increasing need to educate leaders who are able to engage and collaborate with stakeholders outside the traditional company boundaries, the interconnection of the Gap Frame, True Business Sustainability and Collaboratory methodology can provide a useful practice ground. Students as future leaders can explore their collaborative and co-creation skills in collaboration with different stakeholders in responding to societal challenges. Some business schools may be interested in using the enriched SDG Compass as a tool for student consulting and may find help and support in having such frameworks for students ready to be applied.

Fifth, the Gap Frame can be used as an educational journey spanning across courses and even programs. Business School Lausanne runs four Gap Frame Week events every year (one dimension per week) as innovation journeys featuring the Collaboratory methodology. These mandatory built-in program interventions involve and integrate all students, from bachelor to executive level. Learning outcomes go far beyond learning about global challenges, but they include personal development outcomes as well. Working in teams on challenging global issues serves also to test and train their responsible leadership competencies (Muff, 2017). Also at Business School Lausanne, BST 3.0 and the True Business Sustainability typology serve as the underlying framework for their DBA program in sustainable business. DBA students write case studies about companies that are well advanced on their sustainability journey and co-create real-life company interventions to advance towards BST 3.0, using action research and the Collaboratory method (Muff, 2015).

Sixth, the Collaboratory methodology has inspired applications beyond a single business school and has enabled a group of regional business schools in Australia in a soul-searching journey around a common purpose, aims and goals (Blass & Hayward, 2014). An the Globally Responsible Leadership Initiative (GRLI) has adopted the Collaboratory in its broader vision to align its strategic partners towards a common goal (North & Aspling, 2014).

The U.N. PRME progress reports are an excellent way to identify and discover additional uses and applications as time advances. We propose to consider these individual methodologies as well as the combination of these tools as a means forward in the coming decade of the U.N. PRME journey.

7. Limitations and next steps

In summary, the Gap Frame does something that has not been done before. It measures a country against its own ideal state, thus offering the yardstick for further improvements. By outlining where a country stands among all the other countries and compared to a normative ideal state, the gap becomes obvious. Fig. 11 provides a summary overview of the 24 Gap Frame issues that, when addressed, will lead us to a safe space for all of us.

We are fully aware of some clear **limitations** in the available data. First, despite our best attempts to identify indicators that provide data in most countries around the world, there are a number of issues (i.e.: equal opportunity, quality of life and sustainable production) for which we do not have sufficient data to generate values for the world and for some of its regions. For the time being, some data is limited to OECD countries only. Second, our data builds on publicly available data and can only be as good as what has been collected country by country through organization such as the World Bank. Our experts have expressed concern with some of the data (example: employment rate in Madagascar), certainly with good reason. We have at this point no other choice than acknowledging potentially questionable data sources as a true limitation also of our framework. Third, there is a need to better understand the ranges that have been attributed between the worst performing country and the ideal value to be achieved. We have attempted to not make the worst value dependent on a given low-performing number of countries having identified seven different ways in how we treated the data (more details available in our upcoming methodology paper). Here, we simply acknowledge that more work needs to be done to frame these. Fourth, while we have gone to significant lengths to judge where the cut-off points are for the 5 quality levels of an indicators, issue or dimensions – namely: threat, critical, watchlist, safe space, towards ideal – further expert discussions will certainly further

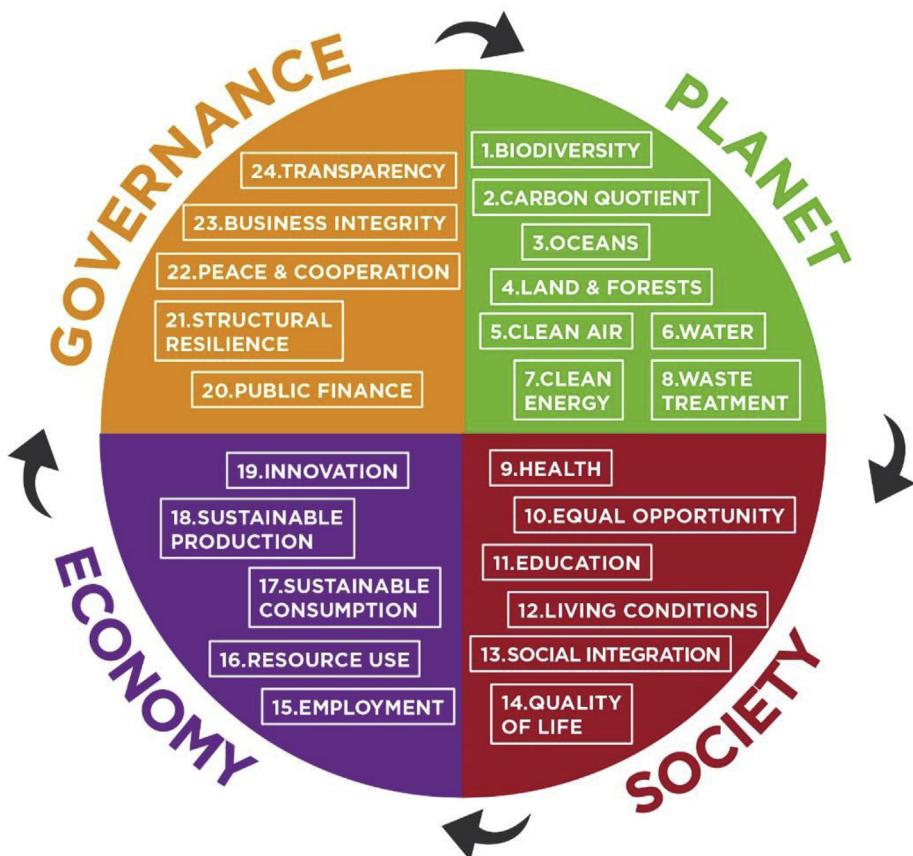


Fig. 11. The Gap Frame – a normative framework involving 24 issues across 4 dimensions (gapframe.org).

improve the fine-tuning of this quality assessment. Fifth, not all data is currently at the level of our expectations in terms of its usefulness. The air pollution indicator which is the alone in informing the “clean air” issue has to be considered a real problem. The indicator is based on data we use from the Environmental Performance Index (EPI) which has defined a 0–100 scale to measure the percentage of population that is exposed to tiny particulate material (PM 2.5 µg/m³). Looking at the data set, we find the data skewed and are looking forward to improve this measure in a next round of reviews.

The Gap Frame serves as a basis to address the Grand Challenges we are collectively facing, by sector, across industries, for an enterprise or as a responsible management educator, building on the “outside-in” perspective of true business sustainability. GapFrame.org provides free access to the result of this multi-sector research effort spanning across 155 countries and 24 Grand Challenges, including national priorities. The validity and the usefulness of the Gap Frame will come from an expansion of its users and applications. We look at this as an open process where we look forward to receive and include feedback and comments in a next iteration of the GAPFrame development. After the publication of the data in 2017 and an extended round of use and application, an expert panel will be formed to review indicator by indicator, issue by issue, dimension by dimension, total results and scores in order to integrate further improvements and amendments that will undoubtedly be revealed in the course of time. A bi-annual revision and upgrade of the framework is an integral part of how its relevance can and must be assured in the coming years.

There is so much more we would like to know and understand. We look forward to doing more work in comparing single and multi-dimensions against each other. For example, we have compared the planet and society dimensions against each other. We realize that an in-depth analysis requires significant more work and data. We are keen to understand the interdependencies both between issues within dimensions and across dimensions. For example, in Switzerland, there is a clear strong (obvious) correlation between sustainable consumption (partially based on the CO₂ consumption) and the carbon quotient (measured as a fraction of the remaining biosphere available after crop- and grazing land, forest and fish stock uses by person in global hectares). There are likely be many more interdependencies and correlations that will help us become better in solving these complex grand challenges of the world.

In a next step, we will add historic data to our set of data in order to enable trend data analysis and related system-thinking tools including loop diagrams highlighting levels of change. This will enable us to assess not only where a country is in a given period (now) but to understand if a country is moving in the right direction (towards the safe space or away from it) in any

given issue and sustainability dimension. We realize that it is important to start by releasing the base data and offer free access to anybody interested to use it. We invite you to use and apply the data on gapframe.org and to share your feedback and comments with us, including an interest to become a part of the multiple expert panels we will be setting up.

As we know very well: "the proof of the pudding is in the eating". This applies very much to the work done to date for the Gap Frame. We also realize how potentially presumptuous it is to consider identifying, much less actually defining ideal values for a broad range of indicators across all relevant sustainability dimensions on a global scale. A next round of experts will review and amend these choices and further improve them, until a further round of experts will further revise these, and so on. Ultimately, it is our goal to provide a leapfrog opportunity to those of us who believe that individuals, organizations and multi-stakeholder groups not only can but must make a difference to address the burning issues of our times. We dedicate this framework to the many millions of fellow citizens who vividly disagree, as we do, with the illustration below and who go to impressive lengths to make a positive contributions in their personal and professional lives and as engaged citizens of this world. Thank you for what you do!



(Source <http://www.goodfriendconsulting.com>)

Acknowledgements

The authors are most grateful for the expert panel that reviewed the Beta Version of the Gap Frame for their substantial and critical support during 2016: Andreas Hauser (Swiss Federal Office of the Environment & Nature FOEN), Mathis Wackernagel (Global Footprint Network), André Schneider, Bruno Oberle, Lorenzo Massa and Albert Merino-Saum (EPFL Switzerland), Mathias Binswanger (FHNW Switzerland), Mark Halle und Laslo Pinter (IISD), Sally Jeanrenaud (University of Exeter, UK), Basil Bornemann (University of Basel), Christian Kobler, Doris Hauser and Antoinette Hunziker-Ebnetter (Forma Futura), Eckhard Plinke (Vescore), Alexander Barkawi (Oikos Foundation).

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.ijme.2017.03.004>.

References

- Agenda 21. (1992). UNCED (United Nations Conference on Environment and Development). <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf> (Accessed 12 January 2016).
- Avina Foundation/Skoll Foundation/Deloitte: Social Progress Index (SPI) <http://www.socialprogressimperative.org/data/spi> (Accessed 12 January 2016).
- Bagnall, J., & Hickman, S. (2014). In K. Muff (Ed.), *Creating connection, conversations, and courage: The exeter collaboratory* (pp. 127–133). Sheffield: The Collaboratory. Greenleaf Publishing.
- Blass, E., & Hayward, P. (2014). In K. Muff (Ed.), *Transforming collaborative institutions: Australian business schools* (pp. 186–192). Sheffield: The Collaboratory. Greenleaf Publishing.
- Buono, A. (2014). In K. Muff (Ed.), *The collaboratory in the classroom: Bentley University* (pp. 150–161). Sheffield: The Collaboratory. Greenleaf Publishing.

- Cercle Indicateurs. (2015). ARE (Bundesamt für Raumentwicklung): Nachhaltigkeitsindikatoren für Kantone und Gemeinden. <https://www.are.admin.ch/are/en/home/sustainable-development.html> (Accessed 20 March 2016).
- Dyllick, T., & Muff, K. (2014). In K. Muff (Ed.), *Students leading collaborators: University of St.Gallen* (pp. 134–149). Sheffield: The Collaboratory. Greenleaf Publishing.
- Dyllick, T., & Muff, K. (2016). Clarifying the meaning of sustainable business: Introducing a typology from business-as-usual to true sustainability. *Organization & Environment*, 29, 156–174. No. 2, 2016.
- Footprintnetwork. (2016). *How do we measure sustainable development? two new indexes, two very different views*. Published on July 20, 2016. (Accessed 30 November 2016) http://www.footprintnetwork.org/de/index.php/GFN/blog/sustainable_development_goals_index_happy_planet_index.
- Global Footprint Network. (2016 Edition). *National footprint accounts* (Accessed 9 December 2016).
- GRI (Global Reporting Initiative)/UN GC (United Nations Global Compact)/WBCSD (World Business Council for Sustainable Development): SDG Compass. The guide for business action on the SDGs. <http://sdgcompass.org/>(Accessed 12 January 2016).
- The Millennium Development Goals Report 2015. United Nations, New York (2015) [http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20\(July%201\).pdf](http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf) (Accessed 9 December 2016).
- Muff, K. (2013). Developing globally responsible leaders in business schools: A vision and transformational practice for the journey ahead. *Journal of Management Development*, (32–5), 487–507.
- Muff, K. (Ed.). (2014). *The collaboratory – a Co-Creative stakeholder engagement process for solving complex problems*. Sheffield: Greenleaf Publishing.
- Muff, K. (2015). Action research as a transformative force in management education: Introducing the collaboratory. In H. Bradbury-Huong (Ed.), *The SAGE handbook for action research* (3rd ed., pp. 351–373). SAGE Publication.
- Muff, K. (2016). The collaboratory: A common transformative space for individual, organizational and societal transformation. *Journal of Corporate Governance*, (62), 91–108.
- Muff, K. (2017). How the circle model can purpose-orient entrepreneurial universities. *Journal of Management Development – Special Issue Entrepreneurial University*, 36(2), 146–162.
- New Economics Foundation. (2006). *The happy planet index. A global index of sustainable well-being*. <http://www.happyplanetindex.org/> (Accessed 12 January 2016).
- North, J., & Aspeling, A. (2014). In K. Muff (Ed.), *A meta-collaboratory: The globally responsible leadership initiative* (pp. 211–226). Sheffield: The Collaboratory. Greenleaf Publishing.
- OECD. (2014). *Focus on inequality and growth -December 2014* (Accessed 10 March 2016) www.oecd.org/social/inequality-and-poverty.htm.
- OECD: The Better Life Index. Measuring well-being. <http://www.oecdbetterlifeindex.org/>(Accessed 12 January 2016).
- Raworth, K. (2012). *A safe and just space for humanity. Can we live within a doughnut? oxfam discussion papers*. February 2012 www.oxfam.org/grow.
- RobecoSAM: Country Sustainability Ranking <http://www.robocosam.com/en/sustainability-insights/about-sustainability/country-sustainability-ranking.jsp> (Accessed 12 January 2016).
- Rockström, J., Steffen, W., Noone, K., et al. (2009). A safe operating space for humanity. *Nature*, 461, 472–475, 10.1038/461472a Medline doi:10.1038/461472a.
- Scharmer, O. (2016). *Theory U – leading from the future as it emerges* (2nd ed.). San Francisco: Berret-Koehler.
- SDSN. (2016). *Sustainable development solutions network (SDSN)*. Retrieved on September 30, 2016 from www.SDGindex.org.
- Sustainable Development Goals (SDGs). (2015). United Nations sustainable development goals. <https://sustainabledevelopment.un.org/sdgs> (Accessed 12 January 2016).
- WEF (World Economic Forum): Sustainability-Adjusted Global Competitiveness Index <http://www.weforum.org/content/pages/sustainable-competitiveness> (Accessed 12 January 2016).
- World Business Council for Sustainable Development (WBCSD). (2010). *Vision 2050. The new agenda for business* (Geneva).