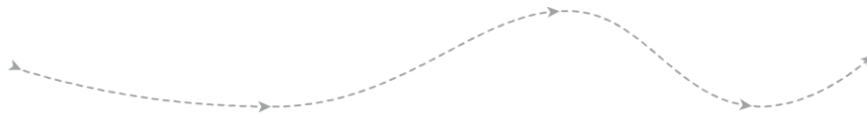# Expert paper

Responsible Research & Innovation: Science with and for Society (with special consideration of the "leaving no one behind" aspect of the Agenda 2030)

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Content

1. The new context for all relevant action

In January 2016 the most significant and ambitious global reform plan of action the international community had ever adopted officially came into force: "*Transforming our world: the 2030 Agenda for Sustainable Development*".[1] The International Community sees the Agenda 2030 as

> "a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. We recognize that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development."[2]

In order to implement this plan of action, all countries and all stakeholders will have to work together in a collaborative partnership

> "… We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet. We are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path. As we embark on this collective journey, we pledge that *no one will be left behind.*" (my emphasis)

The international community announced 17 Sustainable Development Goals (see attachment) and 169 targets, which are "integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental." The goal of this agenda as well as the list of addressees it appeals to is comparable what is articulated in the Preamble of the Universal Declaration of Human Rights: The Agenda 2030 constitutes a *new common standard of practices for all peoples and all nations.*

Achieving such ambitious goals and targets will not be possible without two strategy elements

- Human beings all over the world integrate sustainability in the way the define "a good life" and adopt sustainable consumption, production and waste patterns, and

- Science-based technological advances and innovation in all sustainability-relevant areas.

As complex problems do not have simple solutions and as no single actor, however well-meaning and competent, can bring about sustainable success alone, co-creation and cooperation on the basis of shared values is an absolute *must*.

There are valid reasons to be optimistic: Considering the science-based technological advances achieved e.g. in the areas of *information and communication technologies*, *genomics, chemical engineering, nanotechnology* or *biology*, and comparing it with the state of affairs of the late 1980´s, result were achieved that seemed unimaginable 30 years ago. It was in 1987 that the Brundtland report Our Common Future underlined an issue that points to the core of the COMPASS project:

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[1] See United Nations General Assembly (2015): Transforming our world: the 2030 Agenda for Sustainable Development (https://sustainabledevelopment.un.org/post2015/transformingourworld)
[2] all quotes on the first page are taken from the Preamble.

> "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But *technology and social organization can be both managed and improved* to make way for a new era of economic growth."[3]

An African wisdom indicates what must be done as a next step:

> *Nice words are fine but hens lay eggs.*

The most impressive vision and corresponding policy recommendations need operationalization and implementation on the individual, institutional and political level.

2. Issues to be addressed in the context of responsible research and innovation leaving no one behind

The Responsible Research and Innovation (RRI) of the European Commission rightly demands that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) must work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society. While all actors mentioned are important and have something to contribute, three are of decisive importance:

- individual human beings like all of us with regard to our consumption patterns, energy use and waste behaviour;

- business leaders with regard to their decisions on investment structures, production patterns as well as environmental protection, as well as

- political decision makers with regard to creating the regulatory preconditions for a successful national implementation of the Agenda 2030.

2.1. Individual responsibility of all of us

The responsibility to contribute to the societal transformation the Agenda 2030 is up to every one of us: Individual responsibility for sustainability cannot be shifted onto others and not doing "the right thing" despite knowing the consequences of not doing it cannot be attributed to a lack of good governance, wrong financial incentives or obstructive market circumstances. All human beings all over the world in all their professional and private roles

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[3] World Commission on Environment and Development: Our Common Future (1987), See http://www.un-documents.net/our-common-future.pdf paragraph 27 (my emphasis).

must accept responsibility for sustainable development. Accepting means not only intellectual approval but also coherent action in their sphere of influence. It is the addition of small changes of 7.4 billion people – and above all of the 1.5 billion people at the top of the global income pyramid – with regard to e.g., the use of energy, water, non-renewable raw material, or the mobility patterns will create the sustainability revolution. Waiting for international bodies, governments and businesses to come up with a Deus ex Machina innovation would be *Waiting for Godot*.

Sustainability is a necessary addition to a relevant modern virtue catalog. The recommendation of such an amended virtue ethics approach is the same for all human beings regardless of their professional roles as researchers, citizens, policy makers, business managers and civil society leaders: "Act as a virtuous person would act in your situation."[4] All human beings are moral subjects. The answer to the question "What is the right action in a given situation?", however, has to be answered differently in different contexts: In a functionally differentiated society managers of a business enterprise have a different role, different corresponding tasks and therefore different responsibilities than e.g. a priest in a church community or a researcher in a university or corporate research institute.

The professional responsibility of researchers – in addition of committing to an ethos that excludes fraud, exploitation, fabrication of data, plagiarism, etc. – is to consider sustainability aspects as well as the normative imperative of *leaving no one behind* in all aspects of research work, i.e. research proposals, research conduct, research outcomes as well as access to research results. Ideally researchers have the 17 Goals and 169 targets in mind and understand *integrity* not only as acting in accordance with one's personal value convictions but also in a way that is in line with the available sustainability-relevant knowledge.

2.2.   The responsibility of business leaders

Business has a pivotal role to play; significant progress on the road to sustainability will result only if and when companies integrate the Sustainable Development Goals into business strategies, research and development as well as into the development of innovative products and services. *If* a company publicly communicates that it supports the Agenda 2030 and that therefore e.g. Goals 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) is a normative imperative they want to live up to, *then* it must align target setting and key performance indicators for measuring corporate success accordingly – and it must amend performance appraisals, incentive systems and bonus systems. The same is true for acknowledging the importance of all other goals – Goal 12 (Ensure sustainable consumption and production patterns) being particularly relevant. As there is much evidence that aligning management strategies with the sustainable creates opportunities for the business sector, the Agenda 2020 should not be seen as a threat.[5]

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[4] For an excellent overview on the subject see Virtue Ethics in: Internet Encyclopedia of Philosophy http://www.iep.utm.edu/virtue/ (site visited on November 26, 2016).

[5] Leisinger K.M. (2015): Business needs to embrace sustainability targets. In: NATURE Vol.528, 10 December, P. 165.

Some will argue against this, but I do not see administrative constructs such as a company (the French call it correctly *society anonyme*) to be a moral subject. No company acts exclusively as an abstract legal institution - the relevant moral subjects who make the decisions and implement them are always human beings.[6] Members of the top management play a central role because they are accountable for the task for introducing morally sensitive governance structures – and that includes sustainability-sensitive elements.

In the context of responsible research and innovation this means that

- the *corporate purpose* and *mission* are defined in a way that comprise more than just the business sphere and includes social, ecological and other elements reflecting the spirit of the Agenda 2030;

- the *codes of conduct*, which make clear what values (including sustainability values) all employees should live by when they go about their work, cover all relevant fields of action in their content and use a wording that is unequivocal and capable of being practiced;

- the *corporate guidelines* for activities in sensitive areas such as e.g. environmental footprint, social impact and the physical, mental and emotional health of the people affected by corporate actions. Such guidelines must be worded in a way that compliance with the guidelines can be unequivocally measured;

- *objectives* and *performance appraisal processes* cover not only business-specific, scientific and technical criteria, but also ethical and sustainability criteria; everything that is defined as legitimate activity is controlled by the known tools of compliance management. Of particular importance in times of globalization is the company's sensitivity to the difference between national legality in a particular country and what is perceived as legitimate in most modern societies. Filling the space between legality and legitimacy in a constructive way is one of the most important tasks of corporate responsibility and sustainability management.

In the spirit of what Pat Werhane advocates with regard to "moral imagination"[7], corporate management must conscious of the fact that every business decision and corresponding action has a sustainability dimension. For most business decisions there are alternative options, options which are of greater value from a sustainability and integrity point of view. The mobilization of imaginative powers and the extension of the mental horizon sharpen the awareness for the use of existing room for maneuver for the *Future We want for All*.[8] Integrity—commonly defined as acting consistently with one's knowledge and values—demands the implementation of corporate reform processes consistent with the economic necessities but also the available ecological, social and other knowledge available.

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[6] Leisinger K.M. (2010): Business Ethics by Manager Ethics. In: Küng H. / Leisinger K.M. / Wieland J: Manifesto Global Economic Ethics. Consequences and Challenges for Global Businesses. (dtv), München PP.176 – 207.

[7] Werhane P.H. and B. Moriarty (2009): Moral Imagination and Management Decision Making. In: Business Roundtable Institute for Corporate Ethics. Darden Business School. See also Werhane, P.H. (1999): Moral Imagination and Management Decision Making. Oxford University Press, New York.

[8] UN System Task Team on the Post-2015 UN Development Agenda (2012): Realizing the Future We Want for All. Report to the UN Secretary General. New York.

Last but not least, everything is easier to achieve with an overall governance frame that creates a level playing field and incentivizes individuals in their private and professional lives to do the *right thing*.

2.3. The responsibility of political decision makers

Governments have a critical role to make the Agenda 2030 reality. As the Agenda 2030 articulates (article 55): Each government must set

> "…its own national targets guided by the global level of ambition but taking into account national circumstances. Each Government will also decide how these aspirational and global targets should be incorporated into national planning processes, policies and strategies. It is important to recognize the link between sustainable development and other relevant ongoing processes in the economic, social and environmental fields."

With resources being priced properly and attractive incentives for research (intellectual property) provided, a new generation of products and services with totally new sustainability features will become reality. Resource-intensive and ecologically damaging goods will become more expensive and hence less attractive for use. The higher prices will encourage the search for substitution through innovation. If markets are made to work for the environment by applying full-cost pricing along with the polluter-pays-principle, ecological innovation will be encouraged on the product and process level.

As comprehensive reform process like the Agenda 2030 means substantial change in many areas, and as change has always winners and losers (e.g. reduction of CO_2 versus employment in brown coal surface-mining), a comprehensive public dialogue will be necessary to develop compromises that prevent social distress – and give rise to populist defilers denying scientific evidence[9] that does not fit their political agenda.

While there is a robust consensus on globally shared values representing the common tie that binds humanity cooperation for joint efforts should be conquerable for people working in good faith.[10] There are, however, a number of obstacles to overcome.

3. Obstacles to be overcome in the responsible research and innovation endeavours

Responsible research and innovation (RRI) is, so the EU Framework Program for Research and Innovation,

> „…an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation. (…) Responsible

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[9] See Skeptical Science: The 97% Consensus on Global warming http://www.skepticalscience.com/global-warming-scientific-consensus-intermediate.htm

[10] For the discussion of global values and sustainability see Leisinger, K.M. (2014): Global Values for Global Development. Basel. (http://unsdsn.org/resources/publications/global-values-for-global-development/)

Research and Innovation (RRI) implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society. "[11]

With regard to the reference of an alignment of research and innovation processes and outcomes not only to the "values" (which is achievable), but also to the "needs and expectations of society", it is right and well to say that – but it is a huge challenge to implement. And this for a variety of reasons:

3.1. (Too) long time period between investment and its return

With regard to many aspects of sustainability coherent behavior, human beings face an incentive problem: They are expected to make decisions that result for themselves and others in

- Allocating resources for investments or higher user fees *today* for a presumed return on investment in 10 – 15 years for anonymous people here and far away from home;

- Putting up with concrete inconvenient changes in accustomed production and consumption habits today for a minuscule long-term benefit elsewhere and in the future;

- Putting up with potentially uncomfortable restricted patterns of individual mobility today for an infinitely small contribution to the prevention of problems in the future, and, especially for politicians;

- Inflicting today short-term burdens on the electoral constituencies by which they want to be re-elected for long-term changes and benefits far beyond the election cycles and for a different constituency.

Decisions and actions like these do not fit into the usual pattern of individual, political and corporate decision-making. The fact that sustainability behavior incurs costs and inconveniences immediately while their possible returns only emerge in the longer run and probably for different people at different places in the world makes the Sustainable Development a normative concept: It must be perceived to be the right thing to do, it must be seen as having intrinsic value. To achieve this, a large number of accompanying measures much education from pre-school to post-graduate. It also needs innovative "social marketing": We are dealing with a "new understanding of the game" and with new rules. The production of *telenovelas*, *infotainment-series* and other media propagating the new perspective with new narratives told by attractive role models is likely to give the new rules a *cool* image.

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[11]   see   https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation

3.2.   Pluralistic expectations of society

Different members of societies have different expectations about many things in life. As a consequence, they regard different things to be desirable – and expect different things from governments, companies and other societal institutions. This makes sustainability a "wicked problem"[12] — "wicked" not in the sense of being *evil,* but because of being tricky, devious, messy, ambiguous, interacting and evolving in a dynamic societal context. Part of the wickedness is caused by the fact that a huge number of people was involved in the genesis of the problem and has to be included in the solution attempts, which – see above – necessitates personal action today for an uncertain personal benefit in the future. To "tame" a problem of the complexity, dimension and wickedness presented by the overcoming of the current unsustainable development path, multiple stakeholders all over the world need to be involved: civil society organizations representing the people affected, governments, multi-lateral institutions, academia and the private sector.

The problem becomes even more complex if we include the expectations of the 1.4 billion people living in absolute poverty.[13] Sustainable Development Goals 9 (*Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation*) asks for a "Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries". If this should not lead to an increase of the emission of climate-relevant gases, technology development and implementation of cutting-edge research results will be necessary.

The Agenda 2030 therefore requests to

> "Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending" (Target 9.5)

However, as new technologies usually benefit from the protection of intellectual property, new models for technology transfer must be found, otherwise the prices will be too high and prevent the use of the needed technologies in low- and middle-income countries. The same is true for all other technologies needed for the sustainable development agenda, including new health technologies (diagnostics as well as preventative and curative medicines).

To reduce conflicts of interest between the corporate sector's innovation ability and its necessity for an appropriate return on investment, a "Sustainability Research Fund" ought to be considered, the results of which can be made available for free or at cost through international development cooperation: Financial and technical resources would be made available by the State or international Foundations (e.g. Bill and Melinda Gates) as seed money or to matching funds to support research work the results of which are to be made available at differential prices (soft conditions).

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[12] Horst Rittel and Melvin Webber developed the concept of "wicked problems" for complex social-environmental problems and contrasted them with "tame problems" which are clearly definable and can be solved with pre-existing modes of data research pathways, decision preparation and decision making. See Rittel H.W.J. and M.M. Webber (1973): Dilemmas in a General Theory of Planning. In: Policy Sciences Vol. 4, pp. 155-169.

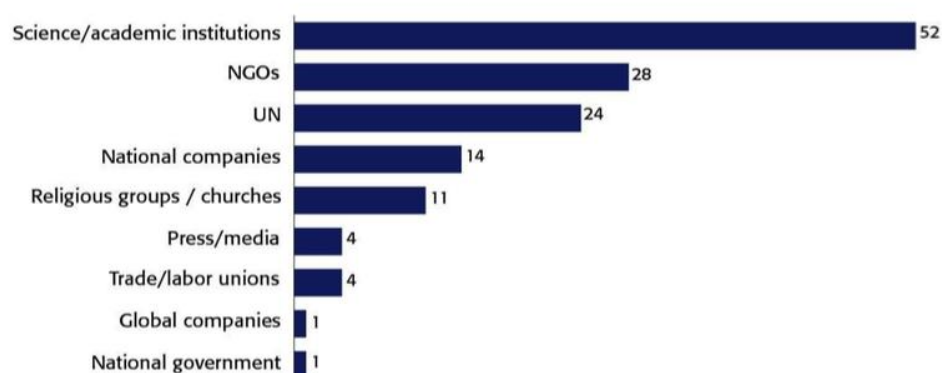[13] According to http://www.globalincome.org/Deutsch/Fakten.html

4. Conclusions

Successful research and innovation done in a responsible manner are preconditions for all efforts to implement the Agenda 2030 for Sustainable Development. The private sector has historically been very successful in its research endeavors, and can be expected to be so also in the context of responsible research and innovation for Sustainable Development. Therefore, business – be they large multinationals or small - and medium enterprises – must continue to be part of the international research community also for sustainability purposes.

In addition to the obstacles mentioned above, we face another serious problem: While a majority of people in 22 countries trust science and academic institutions, people have no trust business to work in the best interest of society:[14]

Trust in Institutions
Net Trust,* Average of 22 Countries, 2015

Institution	Net Trust
Science/academic institutions	52
NGOs	28
UN	24
National companies	14
Religious groups / churches	11
Press/media	4
Trade/labor unions	4
Global companies	1
National government	1

Small and Medium-sized enterprises (being part of "national companies") enjoy more trust than multinational companies. Reasons for this are usually that "bigness" as such causes diffuse public uneasiness, so does the complexity of the business model: Large companies (turnover-, workforce- or profit-wise) with complex activities (e.g. biochemical, nano-technological or genetic engineering or other activities beyond the understanding of laypersons) combine two factors surrounded by societal scepticism. In addition small companies are often well-grounded in local communities whereas multinationals are perceived to be "homeless".

To increase corporate the responsibility performance of businesses (and thereby future trust in businesses), the European Union and the European Commission are promoting two efforts: corporate social responsibility (CSR) and responsible research and innovation (RRI). Corporate responsibility is defined by the EU in a very complex ways as

> "the responsibility of enterprises for their impacts on society: Respect for applicable legislation, and for collective agreements between social partners, is a prerequisite for meeting that responsibility. To fully meet their corporate social responsibility, enterprises should have in place a process to integrate social, environmental, ethical, human rights and

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[14] GlobeScan Radar (2015) Trust, Expectations & Leadership: Global societal trends on perception of business slide 13, see
http://www.globescan.com/images/Reports/Radar/GlobeScan_Radar_Webinar_18June2015.pdf

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consumer concerns into their business operations and core strategy in close collaboration with their stakeholders, with the aim of:

- maximising the creation of shared value for their owners/shareholders and for their other stakeholders and society at large;

- identifying, preventing and mitigating their possible adverse impacts."[15]

However, preliminary research has shown that the five RRI action points are not intuitively clear to business leaders. Why should businesses promote scientific education? How and why should businesses promote gender equality? Why should businesses provide open access to innovation results? These questions are likely to be particularly pertinent for SMEs with low employee numbers.

This report makes two claims:

1. To be successful, a policy effort to make research more responsible can learn from the work that has already been done in *corporate* social responsibility. When dealing with business leaders, the link to corporate responsibility ought to be made – this is likely to improve understanding of the RRI initiative. A possible additional link is the concept of sustainability, which was already promoted as a key RRI action point, but not yet taken up by the European Commission[16].

2. SMEs "are a very important part of the economy, as they represent around 99% of all enterprises" in Europe[17]. To make RRI attractive to them, it needs to provide a competitive advantage. The competitive advantage presented here are "aspirationals", i.e. the increasing number of shoppers who "want their brands to embody an inspiring ethos, to bring a strong point of view, and to take action to make a positive impact on the world."[18] They want to have a "good feeling" that they support the right things to do when they are making purchasing decision.70% of "aspirationals" expect that businesses from which they buy their products, operate sustainably and do not harm the environment.[19] By adding sustainability to the key RRI action points, RRI would not only align with CSR but target an attractive consumer segment that could provide a competitive advantage.

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[15] See http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0681 point 3.1.

[16] http://ec.europa.eu/research/swafs/pdf/pub_rri/rri_indicators_final_version.pdf

[17] http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_small_and_medium-sized_enterprises

[18] BBMG/GlobeScan (2016).

[19] BBMG/Globescan (2015).

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Annex I

Sustainable Development Goals	
Goal 1.	End poverty in all its forms everywhere
Goal 2.	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3.	Ensure healthy lives and promote well-being for all at all ages
Goal 4.	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5.	Achieve gender equality and empower all women and girls
Goal 6.	Ensure availability and sustainable management of water and sanitation for all
Goal 7.	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8.	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9.	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10.	Reduce inequality within and among countries
Goal 11.	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12.	Ensure sustainable consumption and production patterns
Goal 13.	Take urgent action to combat climate change and its impacts
Goal 14.	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16.	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17.	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development