



**Sustainable
Development
Goals: Actors and
Implementation**
A Report from
the International
Conference

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Actors and Implementation**
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Foreword

Josep A. Planell

President, Global University
Network for Innovation (GUNi)

Dear colleagues,

After a massive enquiry process, in September 2015, the UN agreed on the 17 Sustainable Development Goals and their 169 targets, providing an ambitious and challenging roadmap to improve the present conditions of our world. The aim of the 2030 Agenda is for nobody to be left behind, and universities together with all other actors should play a leading role in its achievement.

It is in this context that the Global University Network for Innovation (GUNi) started a long-term project on the role of knowledge, research and higher education in the implementation of the SDGs. Within the framework of this project, GUNi organized the International Conference on Sustainable Development Goals: Actors and Implementation in Barcelona on September 18 and 19, 2017. The Conference brought together more than 60 experts and leaders of governments, public agencies, municipalities, companies, universities and research centres from more than 20 countries to discuss ways to deploy and track the implementation of the Sustainable Development Goals (SDGs) on all levels and scales. This was the first edition of the Conference and the starting point of GUNi's commitment to the 2030 Agenda.

The present document constitutes a report on the main topics covered at the Conference. It includes one article for each parallel session and some articles on keynote contributions. By reading this document, anyone who attended the Conference will be able to review the topics covered, while those who could not attend will get the opportunity to delve into the main issues presented and discussed.

As you probably know by now, GUNi is an international network of HEIs, research centres, UNESCO Chairs and other institutions and agencies related to higher education. It is promoted by UNESCO, the United Nations

University (UNU) and the Catalan Association of Public Universities (ACUP), which has hosted its presidency and permanent secretariat since 2014. The Network currently has more than 210 members from 78 countries around the world. Its mission is to contribute to the debate on the social role of universities and the process whereby they transform societies and knowledge economies. Through the GUNi SDGs project, GUNi is seeking to become a leading actor in the debate and monitoring of the development of SDGs and in the contribution of universities and academic centres throughout.

I sincerely hope that you enjoy going through this report. The goals of the 2030 Agenda are addressed at everyone, and higher education institutions are being called upon to play a crucial role in the implementation of the Sustainable Development Goals. GUNi is ready for the challenge. Are you?

Introduction: The First Edition of the International Conference on Sustainable Development Goals

On Monday and Tuesday September 18th and 19th 2017, the 'International Conference on Sustainable Development Goals. Actors and Implementation' was held in Barcelona, in the Vèrtex building at the Polytechnic University of Catalonia-BarcelonaTech, Campus Nord.

For two days, the emphasis of the debate was on the implementation of the SDGs. All agents involved –universities, governments, cities, companies and public and social entities– gathered in the Mediterranean city to exchange knowledge, ideas, experiences and expectations about the challenges in relation to the SDGs. In numbers: more than 200 attendees and 70 speakers from 21 countries around the world attended this first edition.

Through this Conference, the Global University Network wishes to put the 2030 Agenda on the table of Higher Education Institutions and promote a multidisciplinary and permanent network on the implementation of the SDGs.

The first day featured keynote speeches by Rolf Tarrach, president of the European University Association (USA), and Teresa Ribera, director of the Institute for Sustainable Development and International Relations (IDDRI) of the SciencesPo University, talking about the difficulties for the implementation of the SDGs and the role of universities.

“ Rolf Tarrach: quality in education and gender equality are the two key SDGs to achieve the rest #GUNI SDGs #gender

“ The question is: are we ready and willing to carry out the 2030 agenda? #GUNI SDGs at @la_UPC

In the afternoon, Sijbolt Noorda, president of the Academic Cooperation Association (Brussels), gave a keynote speech on the resetting of university practices and values in the implementation of SDGs; and Jordi Pigem, lecturer, writer and coordinator of the Philosophy Module of the Masters in Holistic Science at Schumacher College, dedicated his keynote to the shift in society from narratives of control to narratives of participation: “we have to reimagine, rebalance and reevaluate our relationship with the world”.

“ Sijbolt Noorda: “disciplinary structure at Universities has lost its value. It’s time for #complexity.” #GUNI SDGs

“ Jordi Pigem: “the world is not made of things. It is made of relations”. #GUNI SDGs

“ Unsustainability begins in the mind of men” Jordi Pigem at the keynote lecture #GUNI SDGs with @lreiguig @SijboltNoorda @ACASecretariat

As part of the first day’s schedule, the document ‘The Commitment of Catalan Universities to the SDGs: Towards a Transformative Education for a New World’ was presented. Parallel sessions touched on topics such as ‘The SDGs at the Heart of the Knowledge Society’ and ‘Implementing SDGs: Actors and Policies’.

“ Eduard Vallory @escolanova21 “We have to start thinking education as a global common good” #GUNI SDGs

“ Wendy Stone @Wendy_Stone “Civil society needs access to research, that already exists, to support their role in SDGs local implementation” #GUNI SDGs

The day was closed by giving voice to the youth, with the roundtable titled ‘Young Leaders in Action: New Voices for the SDGs’.

“ Investing in #youth is investing in development and stability @UfMSecretariat @SDG2030 #GUNI SDGs @UNYouthEnvoy

“ Our conferences are full of people already in the business of #SDGs we need to target & involve the wider audience. #Youth Action #GUNiSDGs

After the Conference, dinner was offered by the Union for the Mediterranean in the emblematic Palau de Pedralbes.

The second day started with keynote speeches from Isidre Sala, Director General of European and Multilateral Affairs at the Catalan Government, on the commitment of Catalonia to the implementation of the UN 2030 Agenda; and from Namhla Mniki-Mangaliso, director of the African Monitor, on the potential and the difficulties of the African continent in bringing about the SDGs.

Parallel sessions were dedicated to the three levels of the Governance of SDGs: global, national and local, while the final group of sessions delved into three areas that will become keys for designing the future of sustainable human communities: Smart and Sustainable Cities, the New Economy, and Humanities.

“ The World Economic Forum, 2016: ~65% of primary-age children will work in new jobs that don't exist yet. What skills do they need? #GUNiSDGs

“ Ellen Hazelkorn: the interconnectivity of society, and of arts, humanities and sciences, is a source of value as well as impact. #GUNiSDGs

“ As always, the challenge is to bring the #SDG down to earth and embed them in the “business as usual” day to day #lavolaRSE #GUNiSDGs #ODS

To finish, Josep M. Vilalta, GUNi Director and Executive Secretary of ACUP, together with Federico Mayor Zaragoza, took the lead in wrapping up the Conference and presenting some conclusions and ways forward.

“ We can create. We can innovate. We can design new solutions in order to reach the #SDGs @FMayorZaragoza #GUNiSDGs

“ The need to combine knowledge society and #SDGs. Knowledge is everywhere, also within SDGs. @JosepMVilalta #GUNiSDGs

“ We can design a different future. We must raise our voices... We will correct and redress the current situation. @FMayorZaragoza #GUNiSDGs

In short, Barcelona became the epicenter for discussing the SDGs on the 18th and 19th of September. Through 6 keynotes, 12 parallel sessions and 1 roundtable, the Conference opened the debate on how the various national and international actors work to foster sustainable development and social transformation at the local and global level.

This international meeting, which will be held biannually, is striving to become a permanent observatory on the role of knowledge, universities and scientific research in the implementation of the SDGs worldwide.



Higher Education's Role in the 2030 Agenda: The Why and How of GUNi's Commitment to the SDGs

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Introduction: the SDG Framework

In September 2015, at the UN headquarters in New York, the international community agreed on a set of 17 Sustainable Development Goals (SDGs) which at the same time included 169 targets to be reached by 2030. The latter compose the 2030 Agenda for Sustainable Development, a redefinition and expansion of the Millennium Development Goals (MDGs), which were to be implemented by 2015 and produced varied and contestable results. In opposition to the creation of the MDGs, which were compiled by a group of high-level technocrats, the SDGs were developed through massive consultation processes with all of society's stakeholders. The SDGs include a wide range of topics and six elements, as defined by former UN Secretary General Ban Ki Moon: "dignity, people, planet, prosperity, justice and partnership". There is no doubt that societies have realised that it is imperative to work on sustainable development as the only way to improve our world and face the huge challenges that we are all facing. The SDGs have met both critics and defenders; according to Neubauer and Calame (2017), they suffer from at least three main weaknesses: First, even though they were agreed by the UN member states, they are not mandatory. Second, they are inconsistent with each other, since some goals contradict others, and third,

they do not address the root causes of imbalances (Neubauer and Calame, 2017:69). Some argue that the SDG framework is still focused on growth (there is even one SDG for growth - SDG8 on Decent Work and Economic Growth), and that sustainability cannot be achieved without tackling the real problem of our modern societies: uncontrolled capitalist growth. Hickel explains this well in his article "the UN's new Sustainable Development Goals aim to save the world without transforming it" (Hickel, 2015). This growth-based paradigm that impregnates our societies is also visible in the way that some university systems have integrated the neoliberal concept of maximum economic growth and turned HEIs into business-like enterprises and knowledge into a commodity (EDES-ACUP-FAS, 2017). Other critics argue that the SDGs are too numerous and broad, and therefore, difficult to implement. In other words, they seek to cover far too many items and topics and end up resembling a list of magic wishes rather than a real action plan. Others also argue that SDG 17 on Partnerships is more of a tool than a goal per se. Despite all this criticism, which is always essential in order to advance and improve, GUNi believes that the SDGs and the 2030 Agenda present a unique opportunity to raise awareness of the importance of taking worldwide action and to start putting measures in place to reach the targets posed. The SDGs are not perfect, but they can function as a catalyst for real change. We might not achieve the whole Agenda, but we might be able to progress to a point that we did not expect a few years ago.

SDG 4: Ensure Inclusive and Quality Education for All and Promote Lifelong Learning

The SDG framework has a specific goal on Education (SDG4 - Ensure Inclusive and Quality Education for All and Promote Lifelong Learning) and makes explicit reference to higher education, although this is only to "ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university" (target 4.3 of SDG4) - the MDGs did not even mention this. Although for some this might be too little, we must acknowledge that higher education institutions are in a distinctive position in leading the implementation of each and every one of the goals; they can encompass and address all goals from different areas of work and action. Universities have long been powerful drivers of change both at local, regional and global levels and they can support the SDGs in a myriad of ways. Some HEIs have already

started to implement and include the concept of sustainability within their campuses, governing bodies, curricula and strategies. A number of networks related to sustainable development have been created or promoted within existing networks (SDSN, IAU-HESD, ISCN, AASHE, UE4SD, SEPN, GHESP, ULSF...), relevant reports have been published, particularly the SDSN Guide to SDG Implementation, sustainability assessment tools and indicators have been proposed and tested (Sustainability Test, SDSN Indicators, Stars AASHE programme, etc.), specific journals such as the *International Journal on Sustainability in Higher Education* have been created (2015) and large numbers of HEIs have signed international agreements and conventions such as the Halifax Declaration, the Talloires Declaration, and the Copernicus Charter for Sustainable Development. GUNi has also demonstrated its commitment to sustainable development by opening spaces for debate and collaboration with the International Conference on Sustainable Development Goals: Actors and Implementation, which is a starting point for all the work that GUNi will do in relation to the 2030 Agenda. When looking at these facts, there is no doubt that HEIs have realised the importance of integrating sustainability in their strategies, both for the benefit of society and for the benefit that integrating it appears to have on the institution itself – according to SDSN, Universities benefit because they can demonstrate impact, capture more demand for SDG-related education, build new partnerships, access new funding streams, and make comparisons with other institutions via an agreed definition of a responsible university (SDSN, 2017:9). The latter is a very interesting aspect of the relationship between SDGs and HEI's. Although HEIs should idealistically encourage and promote sustainability because it is an ethical imperative, if HEIs see relatively short-term returns on their efforts they can be more motivated to integrate the concept and practice of sustainability. A visual way of analysing the scope and awareness among university staff is to check the results of the survey performed by IAU at its 2016 Annual Conference. According to the 2016 IAU Global Survey on Higher Education and Research for Sustainable Development (HESD), more than 70% of respondents (120 HEIs from all continents) were familiar with the SDGs and Education for Sustainable Development (ESD). Moreover, while sustainable development is still considered to be strongly linked to environmental issues (84%), respondents also underlined the importance of societal (68%) and cultural (60%) considerations.

Higher Education's Role in Achieving the 2030 Agenda: Opportunities and Obstacles

The Global University Network for Innovation (GUNi) is one of those networks involved in promoting Sustainable Development in Higher Education. After the above introduction to the state of affairs of the topic, the answer to the question “**why** GUNi has decided to work on the 2030 Agenda in the following years” seems quite clear. GUNi believes that HEIs' involvement in the 2030 Agenda is essential for several reasons.

First, according to SDSN Australia/Pacific, HEIs are in a unique position in societies because they are neutral and trusted stakeholders within them (SDSN, 2017:8). That gives them the chance to promote dialogues and spaces for collaboration between different types of stakeholders and promote certain issues and values without being swayed by corporate interests. Secondly, the 2030 Agenda and the current changes our planet is going through show that we cannot rely on governments alone to make the right decisions, we need the involvement of all actors, and citizens need to be educated, informed and committed in order to make the right decisions. The SDGs will not be met without the active participation of every citizen, and for every citizen to be able to actively participate in the implementation of the SDGs, a set of skills, attitudes and values needs to be fostered. This connects in a big way with the concept of lifelong learning; the current state of affairs of the world makes lifelong learning imperative. Universities work with the people and leaders of the present and future, and they can and must teach them relevant skills and capabilities. There are two main factors in connection to the impossibility of relying on governments and nations alone to solve today's issues: on the one hand, the fact that our increasingly interconnected and globalised planet presents both conflicts and opportunities that are transnational in nature and that cannot be addressed by a sole government, and on the other hand, the parallel emergence of a myriad of non-state actors and their increasing empowerment in different domains of our societies. In this context, knowledge/academic diplomacy has become an essential tool for widening and strengthening partnerships and collaborations between different actors from around the globe. According to Jane Knight, knowledge diplomacy, understood as “the role that international higher education, research and innovation can play in the strengthening of relations between and among countries” (Knight, “University World News”) can help to use the expertise and research undergone

in different contexts within the higher education domain, together with other actors, to address global issues that cannot be solved by a country alone (Knight, "University World News").

Third, HEIs have the ability to help policymakers make decisions based on real evidence that at the same time are made in the light of research based on the principle of RRI – research for and with society. At the same time, universities play a key role in the evaluation and follow-up of policies undertaken by governments. Universities, in their traditional role, are the institutions that create and disseminate knowledge. Universities can put forward innovation and innovative solutions, they train current and future implementers and they have the chance to establish meaningful partnerships. Finally, SDGs need technical capacity, but they also need moral capacity. What does this mean? It means a capacity to commit and to stand for certain values, to live our lives in accordance with ethical standards. SDGs need this type of capacity, and at the same time they provide the opportunity to, according to Neubauer and Calame, "reinvent and build on the humanist and emancipatory tradition of universities, to emphasize the value and agency of human beings, to prefer critical thinking over acceptance of outdated dogmas, and to promote research and education as political issues (in the best sense of the word), thereby contributing to building a fair worldwide community of emancipated citizens" (Neubauer and Calame, 2016:72).

HEIs can and must provide a holistic approach to the 2030 Agenda and advance it, since the SDGs are a key aspect of the social responsibility of universities understood as their duties and commitments to society through their activities and the impacts those activities have. But, are there any specific ways in which universities can proceed with this approach? What can and should HEIs do to support the achievement of the SDGs? How can HEIs promote critical thinking with regard to the SDG framework, its limits and its possibilities? As Eva Egron-Polak stated at the 2016 UNESCO International Institute for Educational Planning (IIEP-UNESCO), "We need to build awareness and show in concrete ways how universities do and can contribute."¹

According to the SDSN guide titled "Getting Started with the SDGs in Universities", one of the most complete and concise documents on the topic published so far,

there are four main areas where universities can contribute to the SDGs: research, education, operations & governance, and external leadership (SDSN, 2017:10). First of all, education needs to be meaningful and address sustainable development; universities can include sustainable development within their curricula and methodologies, foster necessary capabilities and skills, promote humanistic values, evaluate students in sustainability, develop courses aimed at teaching global awareness, and include online and lifelong learning opportunities. Secondly, universities must include the concept of RRI in all their research activities, support research on topics that address the SDGs, support social entrepreneurs, and support capacity building and science for and with society. Thirdly, university governance structures should be in line with the principles of sustainability, and all actions within the university should be directed towards the sustainable goals: green campuses, campaigns on recycling and energy and water waste, ensuring gender equality, etc. Finally, universities should advocate for sustainable development, provide opportunities for inter-stakeholder dialogues and actions as well as developing joint courses and programmes or research groups with other institutions in topics related to sustainable development and the promotion of capacity building. The aforesaid list of actions is just a small and general sample of what HEIs can do. Several networks have started to compile good practices and cases from HEIs to show and serve as examples to other HEIs of how they can take action on the matter. ISCN's 2017 Sustainable Campus Best Practices from ISCN and Gulf Universities "Educating for Sustainability" are good examples of that. IAU's Higher Education and Research for Sustainable Development webpage (www.iau-hesd.net/) and the compilation made by the Catalan Association of Public Universities (ACUP) at www.ods.cat/en/ are good examples too, and serve as inspiration and motivation for other HEIs and help display how universities are committed and socially responsible.

There is a myriad of options through which HEIs can integrate and promote the SDGs, but Higher Education's commitment to the 2030 Agenda does not come free of obstacles, including both external structural factors and internal limitations. These include the difficulty to institutionalize sustainability in higher education because of its trans-dimensional nature and reductions across the board in the funding of research and education (University of Siena, 2017:19). A recent study published in the Journal of Integrative Environmental Sciences titled "Identifying and Overcoming Obstacles to the Imple-

¹ <http://www.iiep.unesco.org/en/three-challenges-higher-education-and-sdgs-3556>

mentation of Sustainable Development at Universities” highlighted, through quantitative and qualitative methods, that the main challenges were the following: lack of support from management, lack of awareness and concern and lack of appropriate technology, among others. An in-depth explanation of those obstacles exceeds the scope of this article, but much research is currently being done in this respect and it is extremely important to pay attention to the results since it is vital to know what the obstacles are in order to overcome them.

GUNi’s Strategy on the SDGs

Considering the abovementioned opportunities and challenges for the higher education sector and the importance of working through partnerships between different types of actors around the globe, GUNi has realized that it can - and must - play a key role in the years to come. GUNi needs to help build on new, relevant expertise, strengthen partnerships, generate exchanges between different cultures and knowledge, and help HEIs to adopt the SDGs. It is for these reasons, among others, that GUNi has opened up a new strategic line of action as part of its working plan for the coming years. This line of action around the SDGs and the 2030 Agenda will be based on three main activities:

- ◆ A biennial International Conference on Sustainable Development Goals. The book you are reading is one of the results of the 1st edition of the Conference held in Barcelona in September 18-19, 2017.
- ◆ A Group of Experts in Higher Education and SDGs. The Group of Experts is a long-term project and an essential aspect of the International Conference. The Group is formed by representatives of different networks of Higher Education and SDGs from around the globe and will meet to discuss and present recommendations to universities and policymakers on the achievement of the SDGs.
- ◆ Several research projects related to the different areas of SDGs in partnership with other organizations.

The establishment of this new strategic line around the SDGs and the 2030 Agenda aims to provide a timely answer to the current challenges our society is facing - identified by the international community - as well as staying true to the core values and objectives of the network. GUNi’s commitment to the SDGs framework is in line with the values of knowledge and training, social responsibility, collaboration, creativity and excellence, and it is essential in order to achieve GUNi’s goals, these being:

- ◆ To encourage Higher Education Institutions (HEIs) to reorient their roles in order to broaden their social value and contribution and strengthen their critical stance within society.
- ◆ To help bridge the gap between developed and developing countries in the field of higher education, fostering capacity-building and North-South and South-South cooperation.
- ◆ To promote the exchange of resources, innovative ideas and experiences, while allowing for collective reflection and co-production of knowledge on emerging higher education issues.
- ◆ To contribute to and reflect on the role of higher education and the implementation of the Agenda 2030 and the SDGs for a better and more sustainable future.

Conclusion

The present article has sought to offer a clear explanation of why the role of higher education is paramount for the achievement of the 2030 Agenda and the Sustainable Development Goals, and why GUNi is therefore committed to undertaking projects and activities aligned with the agreements reached by the international community. Throughout the article we have highlighted the privileged position held by higher education institutions within society in the sense that they can approach and engage with society in a neutral way. Universities have a social responsibility that needs to be addressed and fulfilled, and the Sustainable Development Goals in all their dimensions are an essential part of this responsibility. We have seen that universities can help achieve the SDGs in a holistic way, through their core activities (teaching, research and dissemination), but also in other more innovative ways. Cooperation, collaboration and the exchange of knowledge among different state and non-state actors and different parts of the globe (different cultures, perspectives and ways of working) are vital in order to achieve the 2030 Agenda. GUNi, as a network of institutions and networks of higher education from around the globe, has a key role to play in this respect.

At GUNi, we are convinced that the years to come will be full of challenges, but also opportunities. We will only get to see many improvements if we work together and strengthen our ties and cooperate for the betterment of higher education and, therefore, society.

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From Here to There: The UNITWIN/ UNESCO Chairs Programme in the UN Decade of Education for Sustainable Development and the Sustainable Development Goals

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Introduction

In 2002 the United Nations passed a resolution to implement the UN Decade of Education for Sustainable Development for the period 2005-2014, thus launching a global initiative to conceptualize and implement education for sustainable development as a key contribution to advancing sustainable development in societies around the world. In a multitude of activities, the Decade of Education for Sustainable Development triggered changes worldwide, especially concerning the role and understanding of education for sustainable development. If education for sustainable development was once seen as more of a niche activity in a greater educational system, this viewpoint has now shifted. Today education for sustainable development is seen as an innovative concept that gives a new meaning to teaching and learning in many different educational settings. Education for sustainable development is no longer an “add-on” in the curriculum alongside environmental, consumer or climate education; instead it is an approach offering an opportunity to fundamentally rethink education. Increasingly this means taking a holistic systems approach, one

which assumes that education for sustainable development and the idea of sustainability are not only important for teaching and learning processes but also for the development of educational institutions, whether they are day-care centres, schools, universities or vocational institutions.

The Beginning of Environmental Education to the Global Action Programme

If we look back over the history of educational policy, we see, in the 1970s at the latest, the beginnings of an international discussion about environmental education that was to become an important element of education for sustainable development. Since that beginning, countless international conferences have taken place with the goal of establishing environmental education in the various areas of education, with the United Nations and its organizations taking a leading role in establishing environmental education worldwide. A milestone in this period was the first global UNESCO conference in 1977 on environmental education in Tiflis, Georgia (UNESCO, 1977). This conference had a decisive impact on our understanding of environmental education as an integral element of a continuous educational process going beyond school education to lifelong learning. The overarching goals of environmental education were now seen as including raising awareness, acquiring knowledge and competencies, developing attitudes, and enabling participation.

At the same time there was an international discussion – not least triggered by the report of the Club of Rome with the title *Limits to Growth* (Meadows et al, 1972) – about the threats and dangers human beings pose to the conditions of life on earth. This document, along with others such as *Global 2000* (Barney, 1980) or the Brundtland Report “*Our Common Future*” (United Nations, 1987), made clear that humankind had entered into an unprecedented phase of global change that demanded a new quality in our ability to address human-environmental problems just as much as it demanded new forms of human coexistence. This new understanding of the globality of these changes revealed the existential necessity that humankind use natural and social resources responsibly. It was now no longer possible to speak of education as behaviour adaptation or change; education must become a process leading to individuals taking on personal responsibility for society’s development.

The discussions initiated by these publications on the role of education in sustainable development had their next

milestone in 1992 at the United Nations Conference on the Environment and Development in Rio de Janeiro. At this Earth Summit, the *Agenda 21* was adopted, a document which repeatedly emphasized the importance of education, with Chapter 36 dealing explicitly with education, public awareness and training, including a catalogue of actions for their implementation. This document was to give the discussion about the role of education in sustainable development a central reference point that would play a key role in educational policy initiatives and activities both nationally and internationally in the years to come.

The powerful role that education had been given in the Agenda 21 was reconfirmed ten years later at the World Summit on Sustainable Development in Johannesburg (2002) when in the final declaration and in the action plan the goal was formulated to integrate all aspects of sustainable development at all levels of education, making education a key catalyst for change. This culminated in the proposal for an international UN Decade of Education for Sustainable Development. This recommendation was taken up by the General Assembly of the United Nations and a resolution was adopted to hold a UN Decade of Education for Sustainable Development for the period of 2005-2014. The goal of the Decade was to mobilize educational resources to help implement Agenda 21, as adopted at the Rio summit conference and reaffirmed in Johannesburg, by establishing the principles of sustainable development in national educational systems worldwide.

Other key milestone events contributed to the Decade including the 2009 UNESCO World Conference on ESD, culminating in the Bonn Declaration which called on ESD to,

... actively promote gender equality, as well as create conditions and strategies that enable women to share knowledge and experience of bringing about social change and human well-being.

UNESCO has actively supported actions for enhancing and developing the crucial role of women through the UNESCO Chairs and UNTIWIN Networks on gender and women issues as well as ESD, given that vulnerable groups including girls, women, indigenous and coastal populations are hardest hit by impacts of climate change, including the increasing intensity and frequency of extreme weather events and natural disasters.

The final summit meeting of the UN Decade was held in Aichi-Nagoya in November 2014. Its declaration states that:

Leadership is essential for moving from policy commitments and demonstration projects to full implementation across curriculum, teaching operations, whether in formal systems or in non-formal learning and public awareness.

One of the many goals successfully accomplished during the Decade was persuading major actors in the educational sector to take up education for sustainable development. In the final declaration UNESCO member states pledged to implement a Global Action Programme and called on all stakeholders, especially educational ministries together with other ministries and educational institutions involved in education for sustainable development, to work towards jointly creating knowledge and diffusing education for sustainable development. It states:

... that the Global Action Programme (GAP) on ESD, endorsed by the 37th session of the General Conference of UNESCO as a follow-up to the Decade of ESD and a concrete contribution to the post-2015 agenda, aims at generating and scaling up ESD actions in all levels and areas of education, training and learning.

Beginning in 2015 the Global Action Programme is the follow-up to the UN Decade of Education for Sustainable Development (2015-2019) and is also being held under the auspices of the UNESCO. The goal of the GAP is to launch and intensify initiatives in all areas of education, supporting and advancing the process leading towards sustainable development. The programme specifies five priority areas:

1. The first priority area highlights the crucial role of political policy in advancing a favourable environment for education for sustainable development to develop its potential to change educational systems. The ESD concept should be mainstreamed in educational and sustainability policy-making and integrated in national and international guidelines in these sectors.
2. The holistic transformation of learning and training settings is the goal of the second priority area. Sustainability is not only something to be taught but instead it must be lived and experienced at the place of learning. This can only come about by changing the values and structures of educational institutions.
3. The third priority area is about building the capacities of educators and trainers. Education for sus-

tainable development should be integrated into the professional training of teachers, enabling them to become “change agents” in implementing education for sustainable development.

4. The fourth priority area focuses on enabling and mobilizing youth. Young people should be empowered to participate more closely in the development of political strategies and their implementation in the area of sustainable development.

5. The advancement of sustainable development at the local level is the fifth priority area of the Global Action Programme. Networks need to be created and developed in local communities, where a variety of stakeholders are able to work together to discuss and exchange ideas about sustainability, thereby also improving the quality of learning platforms. Networking these actors enables them to effectively advance sustainable solutions at a local level of the community and increase and strengthen learning opportunities about sustainable development.

In order to advance these five priority areas, actors in education for sustainable development are encouraged to first make voluntary commitments to implement education for sustainable development and then create partner networks as well as a Global Forum so that they are able to meet regularly and exchange ideas, experiences and information.

A further milestone in the academic and public discussion about sustainable development was achieved in 2015 when the United Nations adopted the Sustainable Development Goals (SDGs). This discussion had its beginning in the publication in 1987 of the *Brundtland Report*, and was continued in 1992 with the UN Rio Summit on the Environment and Development, and it reached its first high point in 2000 with the Millennium Development Goals (MDGs). The MDGs, which were to be implemented by 2015, are largely related to meeting the challenges facing countries in the southern hemisphere. Even though some progress was made in achieving its goals, the results are sobering. Many regions of the world continue to suffer from extreme poverty and hunger. Also in the question of gender equality and rights only very modest progress can be observed. Similarly, the goal to build a global partnership for development has been postponed indefinitely due to the eruption of smouldering armed conflicts and the emergence of new wars.

At the Rio+20 Conference a Post-2015 Development Agenda was launched, calling for the creation of universal goals for a sustainable development of the global community. These Sustainable Development Goals (SDGs), which were adopted by the General Assembly of the UN in September 2015, apply equally to developing, emerging and industrial countries and encompass the ecological, social and economic dimensions of sustainable development as well as inter- and intra-generational justice. The fourth SDG on *Quality Education* promotes inclusive and quality education for all:

By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes. By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development. (United Nations, 2015)

This goal supports and strengthens the Global Action Programme of the UNESCO and highlights the crucial role given to sustainable development in all areas of education. It also emphasizes that education, gender equity, sustainable development, and a sustainable lifestyle are closely interrelated and must be addressed as a complex whole if progress is to be made. To this end higher education is called on to educate both women and men with the competencies needed to support social change processes.

The five priority action areas identified by the Global Action Programme – in particular the increased efforts to involve young people in the continuing development of practice and research in the area of education for sustainable development – will undoubtedly play a prominent role over the coming years. As a result of the increasing importance being given to these activities, the UNESCO Chairs involved in issues of sustainable development will also be called upon to play a greater role internationally. They still represent an underused resource, which however by taking an intermediary function in their countries could make a significant contribution, thereby ensuring that education for sustainable development receives greater attention in tertiary education. A closer look at the work of the UNESCO Chairs shows their development until the end of the UN Decade.

UNESCO Chairs in the UN Decade of Education for Sustainable Development

The UNESCO Chair programme was established in 1992 following a decision by the 26th General Assembly of UNESCO to implement the Organization's goals in science and education. There are now over 700 Chairs and Inter-University Networks (UNITWIN Networks) spanning many different disciplines, and 128 countries. This global presence consists of 692 UNESCO Chairs and 50 UNITWIN Networks.² All UNESCO Chairs in Higher Education are part of the Global University Network for Innovation (GUNI), which is in turn a UNITWIN Network. The UNESCO Chairs conduct research and teaching on topics that further the goals of UNESCO based on the principles of inter-university cooperation, international networking, and intercultural dialogue. The UNITWIN programme addresses current issues to support sustainable economic and social development and to date UNESCO Chair and UNITWIN Network projects have succeeded in creating innovative and critical new teaching and research programmes, while stimulating the development of existing university programmes. While the UNESCO Chairs do not receive financial support from UNESCO, many of the Chairs already have a professorship at their institution, and have been awarded the title of UNESCO Chair. They are able to then use this status to leverage the necessary funds for projects that are part of their mandate.

² As of 01 June 2016 (retrieved from <http://en.unesco.org/unitwin-unesco-chairs-programme>)

In the wake of the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, the United Nations proclaimed the World Decade of Education for Sustainable Development for the period 2005 to 2014, and tasked UNESCO with its implementation. This UN Decade became an invaluable framework for expanding the UNESCO Chairs programme, as the number of UNESCO Chairs that focus on topics related to sustainable development increased considerably after the initiative came into effect. An analysis of the current list of the UNESCO Chairs and UNITWIN Networks reveals this significant development, as can be seen in Table 1.

For analysis, the UNESCO Chairs with missions relevant to environmental protection and sustainability were selected and counted if the following key words and phrases appeared in the title of the Chair title: '(education for) sustainable development'; 'sustainability'; 'environment(al) (education)'; climate; bioethics; 'global'; 'renewable/alternative energy'; 'anticipatory'; 'transdisciplinary'; or the corresponding terms in French or Spanish. It is particularly noticeable that well over half of the UNESCO Chairs with references to the environment or sustainability are found on the European continent. It is also worthy of note that, approximately 55 percent of the new UNESCO Chairs with such missions were created during the UN Decade of Education for Sustainable Development.

It is conspicuous that only a small number of UNESCO Chairs were newly established on the African and the North American continents during the UN Decade. It

Table 1: Number of UNESCO Chairs with missions that refer to the environment and sustainability by date of establishment

Year/Continent	To 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total (in the Decade)
Europe	30	1	4	2	3	6	7	4	8	5	3		73 (30)
Asia	4	1		2			1	1	3	1	2		15 (4)
Africa	16				1		1	1					19 (16)
North America	3							1		1	2	1	8 (3)
South America and the Caribbean	7	2						2	3	1	1		16 (7)
Australia, New Zealand and the Pacific													0
Total	60	4	4	4	4	6	9	9	14	8	8	1	131

Source: The Authors

is also conspicuous that there are currently no UNESCO Chairs at all with references to the environment or sustainability, in Australia or New Zealand. If one looks at the country-specific distribution of UNESCO Chairs, Russia (18), Spain (12), Italy (8) and Canada (5) are clearly at the top of the list.

If one takes the total number of all UNESCO Chairs (661), and relates them to the number of Chairs relevant to environment and sustainability (131), then one can see that around a fifth of all UNESCO Chairs are devoted to issues relevant to sustainability and the environment. This does not take into consideration those Chairs that are concerned with challenges such as desertification or water conflict, and which, therefore, have at least an indirect link to issues of sustainability.

A similar situation can be seen concerning the worldwide distribution of the UNESCO Chairs with a more specific reference to education, whether concerning the environment or sustainable development (Table 2). Sixty percent of a total of 32 UNESCO Chairs for environmental education, or education for sustainable development, are found in Europe.

Of the current 32 UN Chairs for environmental education or education for sustainable development, two-thirds were established during the UN Decade. Moreover, of those Chairs newly established during this time, over half are, again, to be found in Europe. A country-specific analysis shows that Sweden has the most UN Chairs with a reference to education (4).

Without attempting to rank or weight their importance, there appear to be a number of possible reasons for this distribution of UN Chairs in different countries and continents. They all have to do with varying degrees or levels in different countries of:

- ◆ the perceived importance of the UNESCO in general
- ◆ the awareness of the UNESCO Chair programme
- ◆ the perceived importance of environmental and sustainability issues
- ◆ specific interests on the part of the UNESCO or national UNESCO Commissions, which play a role in the establishment of UNESCO Chairs
- ◆ the regard for the title "UNESCO Chair"
- ◆ financial incentives to establish UNESCO Chairs, which is particularly critical in developing and emerging countries
- ◆ academic recognition of UNESCO Chairs in higher education systems
- ◆ personal commitment towards the goals of the UNESCO by individuals applying for a UNESCO Chair
- ◆ perceptions by individual academics of the value of the UNESCO Chair as a means to increasing their scientific impact

There are certainly more reasons that might serve to explain this distribution of UN Chairs. Those listed here only indicate that there is a large spectrum of reasons for the uneven distribution of UNESCO Chairs in different parts of the world.

Table 2: UNESCO Chairs for environmental education or education for sustainable development by date of establishment

Year/ Continent	Until 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total (in the Decade)
Europe	7	1	2		1	1	3	1	1	1	1		19 (7)
Asia	1			1				1		1			4 (1)
Africa	1				1								2 (1)
North America	1							1			1		3 (1)
South America and the Caribbean								1	1	2			4 (0)
Australia, New Zealand and the Pacific													0
Total	10	1	2	1	2	1	3	4	2	4	2		32 (10)

Source: The Authors

Conclusions

The UNESCO Chairs, together with UNITWIN projects such as the Global University Network for Innovation (GUNi), made an active contribution to the worldwide UN Decade on Education for Sustainable Development, in particular in the area of higher education. Even though a number of UNESCO Chairs focusing on specific issues related to sustainable development, and to education for sustainable development, have been established in several countries over the past few years, it has unfortunately not yet been possible to anchor sustainability in the teaching that occurs in higher education – apart from specific examples, such as Sweden, where higher education institutions are legally required to promote sustainable development. UNESCO Chairs should be given the resources and opportunities to take on even greater responsibility for this area of education, as its graduates play a key role in disseminating ideas about how society should develop, and they make a significant contribution to sustainable development through science and research.

The SDGs mark an important turning point in the focus of the UNESCO Chair and UNITWIN Programme work as well as a challenge to build on their acknowledged achievements. As high-lighted earlier, the SDGs place an earnest call on higher education institutions to focus their endeavours on addressing the world's most fundamental developmental issues – not only those related to education but on all areas of human activity – from clean water and healthy living spaces, to peace building, issues of gender disparity and non-discriminatory prosperity. The challenges for the UNESCO Chairs on ESD, and indeed for all the UNITWIN Networks such as GUNi and Chairs across all fields of activity, is to now use their power of collective creative thought to find solutions to meet these challenges. The Chairs in ESD have now entered a period of consolidation and forward strategizing – a period which requires them to look beyond the theory to the practical and to pertinent problem solving. Turning theoretical knowledge into practice demands them to be at once trans-disciplinary in their implementation design world-wide, to cooperate and collaborate with the wider family of UNESCO Chairs and to urge the full embodiment of ESD into the broader research, teaching and learning higher education agenda towards 2030.

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Some rights reserved. This work is available under the Creative Commons Attribution-ShareAlike 3.0 IGO licence (CC BY-SA 3.0 IGO; <https://creativecommons.org/licenses/by-sa/3.0/igo>). / GUNi has been added as an example.

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17 Goals to Change the World

Federico Mayor Zaragoza

President of Fundación Cultura de Paz

We are facing global challenges that, for the first time in history, could lead to points of no return. All humankind is threatened by the progressive deterioration of the conditions for a dignified life on the planet. Because of the growing population and the specific activities of mankind, human life on Earth is having an influence on its ecological conditions. We are in the *anthropocene*, meaning that the inhabitants must be made aware of the urgent need to change their lifestyles and reduce as soon as possible emissions and by-products of the present way of life worldwide, in order to redress some of the most dangerous present trends.

Global threats can only be counteracted by global actions, and it is very clear today that, as Amin Maalouf has said, “unprecedented situations require unprecedented solutions”.

We have many diagnoses but no timely treatments and now is the moment when it is necessary and very urgent to issue a warning, from the most concerned communities, that if these measures are not adopted, then the next generations could be faced with insurmountable problems.

In recent years, some leaders -as is the case of President Barack Obama and Pope Francis- have added their voices to encourage the adoption of timely measures that must be put into practice without further delay. The Agreements of November 2015 in Paris on Climate Change as well as the Sustainable Development Goals are to be implemented because otherwise “tomorrow may be too late”, as we are dealing with potentially irreversible processes.

Neoliberal globalization, with an economy based on speculation, delocalization of production and war (every day more than 4 billion dollars are invested in armaments and military expenditure while thousands of people, most of them children from 1 to 5 years old, die of hunger and extreme poverty), but also the “great domain” (financial, industrial, energy, media...) have been able not only to appoint governments in the cradle of democracy, Greece, without elections, but also to use the media as a meth-

od. Actors in the struggle for the transition to a knowledge-based economy for global human and sustainable development, promoting very rapid transit from a culture of imposition, domination and war to a culture of encounter, conversation, conciliation, alliance and peace. From force to word.

For all these reasons, it is very clear that it is completely unacceptable for President Trump not only to have requested an increase in investments in defence (which has been agreed by most neoliberal countries, including of course the European Union!) but, even worse, to have announced that the United States will not comply with the Paris Agreements on Climate Change. This is simply unacceptable, because it not only affects his country and the citizens of North America but all human beings, a particularly poignant fact being that for the first time the legacy of the present generations to the succeeding ones could be of less quality than those they have enjoyed.

I consider the VI Report of the GUNi to be particularly relevant because it addresses the social responsibilities of universities and, at large, the scientific, academic, artistic and intellectual communities, that need to be at the forefront of global mobilization movements, the full implementation of the SDGs and of the Agreements on Climate Change. Catalan poet Miquel Martí i Pol wrote “... all is possible.... but who if not all?”. Yes, it is now the time for “We, the peoples”, as expressed with lucid farsightedness in the first sentence of the Charter of the United Nations.

Yes, it is necessary now to invent the future -every single human must be able to create our hope- in order to apply to all the corners of the world the five UN priorities: food, water, health services, environmental care and education. There are three main pillars to ensure the application of the development goals: knowledge, cooperation and innovation. Until two decades ago, the vast majority of human beings were born, lived and died in a very small space of just a few square kilometres. Today, because of digital technology, not only do we know what is happening worldwide but we are able to express our views freely. We must all be aware that the capacity of not remaining silent is today our duty to ensure a rapid reaction when we realise that the conditions for dignified life are in danger. It is because of this capacity that it is now possible to react strongly against the decisions announced by President Trump, telling him that if there is not a complete change in his decisions, “We, the peoples” will not be consumers of the products coming from the USA and will substantially reduce our trips and visits to his country. Future generations must be at the centre of our everyday behaviour.

They do not deserve this kind of leadership, one which could be redressed if millions of voices so demand.

Now we also have, and this is a crucial matter, the cooperation of women, who for centuries were always marginalized. Now, they are -to repeat what Nelson Mandela told me in Pretoria in 1996- the "cornerstone of the new era".

Yes, now, when we say "We, the peoples", we refer to all the peoples with no discrimination of gender, age, skin colour, ideology, beliefs...

In this new governance, local institutions will be progressively more important. Cities will be particularly relevant in the future.

And at national, regional and global level, it is absolutely necessary to have a democratic system, guided -as is enshrined in UNESCO's Constitution- by the "democratic principles" of justice, freedom, equality and solidarity.

Participation of the people, of "educated" peoples -those defined as "free and responsible" by article 1 of UNESCO's Constitution- to be able to put into practice all the development goals and, as agreed at the Lisbon Summit of the European Union, a knowledge-based future. Only thus shall we have the watchtower that we require in order to prevent most of the events, which is always the most important victory.

A new design is absolutely indispensable and in the university and scientific communities, creativity plays a particularly important role. Promotion of research is essential at this time: "There is no applied science if there is no science to apply", as the Nobel Laureate Bernardo Houssay said.

From force to word: this historic transition will be only possible if the social responsibilities of all peoples are accomplished and, in awareness of the problems and of the possible solutions, they join their voices to take the reins of common destiny into their own hands.

SDGs and the Role of HEIs: Between the Crossroads and the Reality

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GUNI's intellectual, critical thinking and action related to the implementation of the general orientations of the 4th SDG, related to HEIs, from *The Incheon Declaration and its 2030 Framework for Action (November, 2015)* has, until now, had to initiate a highly specific and strategic focus to generate the possibility for the mobilisation and activation of universities all over the world and its own organized networking regions.

The proposal to activate new interrelated-collective efforts and global/local networks (as GUNI is already discussing) involving universities and HEIs, must ensure inclusive and equitable quality higher education, socially responsible research and the promotion of lifelong learning opportunities for all.

At GUNI's *International Conference on Sustainable Development Goals: Actors and Implementation (September, 18-19) held at Universitat Politècnica de Catalunya-BarcelonaTech, and at its Parallel Session No. 3: "SDGs and the Role of HEIs"*, the participant experts provided a set of valuable ideas concerning the main topic.

In general terms, they all agreed on the proposal to investigate new interrelated-collective efforts and global/local networks (as GUNI is already discussing) of universities and HEIs, to ensure inclusive, equitable and quality higher education and socially responsible research, and to promote lifelong learning opportunities for all.

The experts at the aforementioned parallel session also discussed some very important concepts and figures: for instance, Daniela Tilbury, Vice-Chancellor and CEO of the University of Gibraltar, described how the already wide gap between developed and underdeveloped countries has become alarmingly wider in recent decades, and this is expressed in the reproduction of more social inequalities, and in the soft energy in the governance and leadership to produce real changes, since the influencers of the

social and political framework to achieve the SDGs are academics, but they lack the tools to act as game-changers.

Also, in the point of view of Hilligje van T'Land, Secretary General of the International Association of Universities (IAU), the main efforts of HEIs must focus on building more bridges with other organizations, networks, universities, governments and other stakeholders, which must be designed to improve common actions involving universities and HEIs, for the IAU's recent survey showed that these institutions have little interest in achieving the SDGs on a strategic level, or in collaboration, in order to promote a collegiate agenda.

The talk by Charles W. Richardson, president of the Association for the Advancement of Sustainability in Higher Education (AASHE), strongly underlined the need to encourage and motivate real learning and cultural changes.

The new global/local role of universities and HEIs has become a highly specific issue for the UN-SDGs, since the links with and impact of HEIs regarding the learning and curriculum process in the general education system, and because of socially responsible research, production of new knowledge and social innovation related with the major challenges of the current period: changing labour markets, technological advances, urbanization, migration, political instability, environmental degradation, natural hazards and disasters, competition for natural resources, demographic changes, increasing global unemployment, persistent poverty, widening insecurity and expanding threats to peace and safety (See SDGs: Target 4.3.), above all in the context of underdeveloped and emergent economies and societies.

Nevertheless, in the diverse and disarticulated higher education systems in those contexts, the SDGs cannot be achieved if in the next five years universities and HEIs do not make radical changes to their own organization, visions, curricular platforms, socially responsible research and innovations for social good, reinforced autonomy and responsible outlooks, in order to become real actors and demand the same responsible efforts and common agendas from other actors and stakeholders.

At this crossroads, unfortunately, this is not the reality in many underdeveloped and emergent countries.

UNESCO's World Education Report (GEM Report, 2016), which evaluates and monitors the SDGs, notes that if there is no real change to current trends in the next five years, it is unlikely that many countries in the world (with the exception of the developed economies) will even achieve

the general goals by 2030, or even by 2054, with gaps of 58 years in some countries, while other have little hope of even achieving these goals by the end of the century.

The difficulties will affect, above all, girls in Sub-Saharan African countries, in some South Asian countries, and in the poor countries of Latin America and the Caribbean, and with most damage caused to ethnic groups in rural zones.

It is discerned that some governments and educational authorities do not understand that the Education SDGs are related with the other goals and agendas, because one step forward in education will have a positive impact on the others.

The SDGs in the HEIs in Latin America and the Caribbean

From the perspective of what is happening in some regions, since the United Nations and UNESCO established the map to guide common efforts to achieve the SDGs (2015), a suitable picture is not developing.

For instance, in Latin America and the Caribbean (Didriksen, et. al. 6th GUNI World Report, 2016) the social inequality regarding access to tertiary education in the last decade is now even worse than at the end of the last century: between the richest and poorest quintiles among 18-24 year olds there is a difference of around 70% in opportunities to enter education at this level and to stay there until achieving the required grade. This condition is more difficult for ethnic groups in rural areas, in women from the same social groups and for young people from the poorest urban areas. The trend towards commodification of HEIs is more widespread than in other parts of the world, and has a negative impact on the possibility to extend access to the whole population.

In some countries, these inequalities have been transformed, as has happened in Cuba, Ecuador, Venezuela, Argentina, Uruguay and Bolivia (idem), but in most countries the University and HEIs system is almost the same as in previous decades, with the same professionals offering a highly limited curriculum, a high level of graduate unemployment, little major research activity at the different institutions, and poor performance in the production of knowledge and scientific discoveries. Social responsibility and the exercise of critical thinking at universities mainly comes from student movements and sometimes from academics and lecturers.

In the last CINDA Report on Higher Education in the region (2016), the balance was more or less the same. Current reports from the UNESCO sub-regional offices make it screamingly obvious that if major changes are not made to government policies and other political and economic actors in order to establish real commitments to the SDG agenda, the transversal educational goals will not be achieved before 2050 in terms of universal access to basic and secondary education, and it will not be until 2080 that the HE system will be offering lifelong learning for all. A worrying reality in the midst of so many challenges.

Nevertheless, next year, we, as researchers, teachers and students, rectors and in general everyone involved in higher education affairs, will have an extraordinary opportunity to discuss strategies and goals for the immediate future. This opportunity will be the Regional Conference on Higher Education organized by UNESCO and its International Institute (The Institute for Higher Education in Latin America and the Caribbean -IESALC, in its Spanish acronym). This is a huge conference (the biggest in the world, in fact), attended over the course a whole week by hundreds of participants from government offices, universities and institutes, academics, students, scientific networks, associations, etc.

We have been organizing a very interesting agenda that cover topics from access by more young people to the construction of a Latin American knowledge Society, through the relationship between curricula, new paradigms of learning and research, to interculturality and the social responsibility of universities to the people.

Societal Engagement in Higher Education: Pathways to SDGs

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The global community has pledged to achieve 17 Sustainable Development Goals (SDGs) for all humanity. This 2030 Agenda provides a universal framework to which each country, region and community can prioritize its needs and address them locally. While national policies and commitments are necessary, local priorities and ownership will be critical to universal achievements of the SDGs in the next 13 years. This should become a societal commitment, and not merely of the national governments that are signatories to these documents in the UN. Contextual relevance and local priorities alone will enable local governments, businesses and civil society to contribute their resources and efforts towards the realization of these SDGs.

This article touches on the importance of Higher Education Institutions (HEIs) in community-based research and social responsibility. These reflections are based on the issues discussed at the “SDGs and Social Engagement” session held at the International Conference on Sustainable Development Goals: Actors and Implementation (Barcelona, 18-19th September 2017).

Higher Education Institutions can become important actors in the achievement of the SDGs in each society and community. In particular, they can ensure that SDGs are included on local agendas; educate the SDG generation; build capacities for SDG policies, planning & management etc. (Grau et. al., 2017, p. 499). However, HEIs have historically been somewhat distant from the processes of framing and implementing various national and supra-national development programs in several societies. However, if the SDGs are to be realized, then all institutions and actors in each society and community must get involved. HEIs have enormous potential to contribute towards the same in many different ways. Traditionally, service to society has been one of the missions of higher education and HEIs in several countries.

However, HEIs have three important missions—teaching, research and service.

Societal engagement has traditionally been boxed in as a service to society. Certain departments and faculties of a university bear most responsibility for this service. Extra-mural studies, extension education, social work and adult education departments and units at universities have been given this mandate to promote societal engagement. Much of this engagement is a form of extension of expertise, ideas and solutions available from universities to the communities outside. This approach has mostly relied on one-way communication, and priorities of university staff, faculties and students have determined the focus, timing and location of such engagement. In order to demonstrate ‘engaged service’ models, innovations and pilots, the service function may be designed to be carried out from an engaged stance. Internships, field placements, co-operative education and service-learning are some of the forms of engaged service that are presently used (Tandon, 2017, p. 12).

A significant shift towards the universalization of the SDGs starts from the premise that partnership across multiple stakeholders has to be mutually respectful and beneficial. HEIs can become critical stakeholders in this process if they approach societal engagement from this perspective of mutuality. Additionally, engagement through service alone is not enough. HEIs need to consider a holistic approach to societal engagement, an approach that includes all three of its missions—teaching, research and service.

Students at HEIs are the future economic, social and political leaders of their societies, where if guided at this stage, they can become important champions of and contributors to the achievement of the SDGs. Hence, students need to learn about these 17 SDGs during their studies, including why these have been prioritized, what potential solutions are relevant to their local contexts and how achievement of such SDGs can contribute to enhanced well-being of their communities and societies. This will require revisiting the curriculum and pedagogy of teaching at HEIs (Tandon, 2017, p. 8). All subjects, courses, programs and syllabuses can be reviewed in order to identify ways in which an understanding of several SDGs can be integrated in the same. For example, SDGs focused on urbanization can be applied to courses on architecture, planning, economics, public administration, civil engineering, hydrology, sociology or law. A vast number of possibilities for incorporating some aspect of SDGs related to the urban agenda.

The biggest challenge here comes from disciplinary rigidities in HEIs. Each discipline prescribes the syllabus as a benchmark of excellence. SDGs do not neatly fit into single disciplines. People's lives do not fit neatly into academic disciplines either. Hence, flexible curricula and a trans-disciplinary approach are essential if students are to learn about the SDGs.

A related aspect is the pedagogy of teaching and learning. Classroom-based teaching is inadequate for a contextually relevant understanding of SDGs and the challenges for achieving the same. Engaged teaching will be especially useful when concepts, theories and principles are learnt through their interpretation and application in the context of students themselves. The pedagogy of engagement will require additional preparation of teachers, and new partnerships with other societal actors outside of academia.

For example, in the regions around Rhodes University in South Africa, water scarcity is beginning to be a huge problem affecting farming, livelihoods and industry, as explained by its professor Heila Lotz-Sisitka. The students and faculties of several academic disciplines are working together with the local government, farmers and other Civil Society Organisations (CSOs) in the region to learn about various aspects related to the policies and practices of harvesting, storage, distribution and pricing of water in that region. This approach prepares those students to learn about SDGs related to water, health and well-being as part of their studies.

HEIs are knowledge institutions as well, and research is one of their most important missions. The achievement of the SDGs will require innovative solutions that are contextually appropriate and sustainable. To this end, it is crucial for HEIs to undertake such research, and in order for it to become relevant to contextually prioritized SDGs, local universities and HEIs must undertake research in partnership with local stakeholders. However, the current practice in academia is that framing and conducting research is an internal activity, with little consultation with external actors.

An approach to the co-construction of knowledge will entail shifting the lens from the internal to external. Research questions can be generated from external actors around locally prioritized SDGs. Research could be conducted as a partnership between academics and community actors—businesses, local governments and civil society. The nurture of such partnerships requires openness on the part of academics to new research questions and methods. The building of such partnerships between universities and so-

cietal actors must recognize that knowledge also resides outside of academia—in communities, and among practitioners and various other actors.

Additionally, research methodologies must become more inclusive and pluralistic. Community-based participatory research (CBPR) methodologies may need to be learnt by young researchers interested in introducing new knowledge to address SDGs. While learning to value local community knowledge as the basis for new knowledge is challenging, structured training in CBPR can facilitate such learning, and can help to prepare both students and faculties to work in partnership with communities (Tandon & Singh, 2015, p. 300). This would include training on knowledge mobilization and dissemination, consultation and community engagement, research ethics and equity in interdisciplinary partnerships. These skills would help the researchers to actually work in, and with, communities (Lepore, 2016, p. 53). Such methodologies respect local indigenous and practitioner's knowledge. They also view knowledge holistically. Control over such knowledge is shared between the researchers and the community such that all parties can use 'Knowledge for Change' (K4C).

Closely linked to this ideology is the UNESCO Chair's Knowledge for Change (K4C) initiative, kick-starting in January 2018. K4C is an international partnered training consortium, built on partnerships between HEIs & Civil Society Organizations (CSOs) for the co-creation of knowledge. It aims to build research capacity to address local challenges, in line with the UN's SDGs (UNESCO Chair, 2017).

Further, the Living Knowledge Network (LKN) in Europe brings together science shops that play similar roles by providing an opportunity for citizens and communities to pose research questions to HEIs so that their local problems can be addressed. In the words of the LKN coordinator, Norbert Steinhaus, science shops act as mediating structures to help build and nurture such mutually beneficial research partnerships between HEIs and communities. This approach can readily focus on locally prioritized SDGs to introduce innovative solutions to address them locally.

There is great potential and need for sustained and serious contributions from higher education to the attainment of the SDGs in all countries and societies. HEI resources and institutions must be mobilized in order to support the achievement of the SDGs everywhere. For this to happen, several challenges will soon have to be overcome in different contexts:

- ◆ The current gap and mistrust between HEIs and society around them need to be addressed by concrete actions from all parties.
- ◆ The global intellectual property rights system needs to be modified to make new knowledge work towards actual changes in societies.
- ◆ Open and transparent communication between HEIs and other societal actors—especially local governments, businesses and civil society—needs to be enabled in a mutually respectful manner.
- ◆ Teachers should be empowered, capacitated and encouraged to adapt teaching curricula and pedagogy beyond disciplines and classrooms, specifically around locally prioritized SDGs.
- ◆ Leadership of HEIs should make a public commitment to supporting the achievement of the SDGs in their communities and contexts.

Therefore, higher education has the opportunity, in collaboration with civil society and other knowledge workers, to co-create transformative knowledge, which implies six profound changes to the way we perceive and create knowledge. These changes imply a shift from a mono-culture of scientific knowledge to an ecology of knowledge; from rational knowledge to integral human knowledge; from descriptive knowledge to knowledge for intervention; from partial knowledge to holistic/complex knowledge; from an isolated creation of knowledge to social co-creation of knowledge and from a static use of knowledge to dynamic and creative knowledge (Sanchez & Escrigas, 2014, p. 63).

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Joining the Dots between Responsible Research and Innovation (RRI) and the Attainment of the Sustainable Development Goals: Good Practices Africa Can Learn From

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Introduction

By 2030, global development is expected to have moved in the 17 interlinked directions of the Sustainable Development Goals (SDGs). The momentum with which countries will attain the goals will be driven largely by at least four factors- ample political will, generous resourcing, application of research and innovation and mobilisation of relevant stakeholders. This paper addresses the research and innovation factor and digs into an aspect of it that ties all the other three factors together as Responsible Research and Innovation (RRI). It will be argued that without a respectable presence of RRI, the attainment of all the SDGs may be difficult. The context of discussion will be Africa.

Africa is a continent of contrasts. It is one of the most naturally-resourced regions in the world, yet it is home to the world's poorest people. Its soil and other conditions for agriculture are about the best in the world, yet food and nutrition safety is still a daunting challenge. By 2050, its population is expected to rise to 2.5 billion, making it the fourth most-populous continent in the world. Estimates further indicate that by 2100, Africa will have a population of 4.4 billion and be home to about 40% of the people on our planet.

The realisation of this emerging scenario led the African Union to adopt the Agenda 2063. This is a strate-

gic framework for the socio-economic transformation of the continent over the next 50 years. The agenda envisions the *Africa We Want* as (a) a prosperous Africa based on inclusive growth and sustainable development; (b) an integrated continent that is politically united and based on the ideals of Pan-Africanism and the vision of Africa's Renaissance; (c) an Africa of good governance, democracy, respect for human rights, justice and the rule of law; (d) a peaceful and secure Africa; (e) an Africa with a strong cultural identity, common heritage, shared values and ethics; (f) an Africa whose development is people-driven, relying on the potential of the African people, especially its women and young people, and caring for children; and (g) Africa as a strong, united and influential global player and partner.

The Agenda 2063 overlaps and pushes beyond the target year of the UN Sustainable Development Goals of 2030. In this paper, the linkages between the regional and global goals will be highlighted with a focus on the first four SDGs. The role of RRI in the pursuit of the goals in the march to 2063 and 2030 will be described with lessons learned from some good practices from Europe. First, we begin with some reflections on the concept of Responsible Research and Innovation (RRI).

Responsible Research and Innovation (RRI)

Responsible Research and Innovation (RRI) is an approach that expands the focus of research beyond the narrow scope of the individual or corporate researcher to include a panoply of societal actors such as policy-makers, civil society and significant others within the community, in order to better align both the process and the outcomes of the enterprise with the values, needs and expectations of society. This is a model of research and innovation that stresses a *"transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products"* (Von Schomberg, 2017).

The differentiating factor of Responsible Research and Innovation is its main and final goal: socio-economic development and improvement of the living conditions, health and well-being of our societies. For research and innovation to be labelled "responsive", it has to take local needs, values, and opportunities as the starting point. Its processes and products should comply with local and global ethical principles and standards.

Good Practices from Europe

As narrated by Galiay (2017), RRI has been supported by the European Commission under its Framework Programme for Research and Innovation (R&I) since 2011. RRI is defined in various policy papers by the European Commission as being an “approach aiming to encourage societal actors to work together during the whole research and innovation (R&I) process to better align R&I and its outcomes with the values, needs and expectations of society”. The European Commission pleads for Responsible Research and Innovation (RRI) in order to respond more effectively and urgently to major societal challenges, such as climate change, ageing population, food, water, materials and energy safety, public health, and security (European Commission 2013).

In practice, the European Commission’s implementation strategy for RRI focuses on public engagement in R&I, science education, the accessibility of the R&I outcomes, high attention to ethics and promotion of gender equality. R&I governance is often mentioned as a sixth dimension, because progress is rarely sustainable without changing its settings in the plethora of different kinds of R&I stakeholder organisations (Galiay, 2017).

Progress on mainstreaming RRI in Horizon 2020 is measured by a single Key Performance Indicator “Instances where citizens, Civil Society Organisations (CSOs) and other societal actors contribute to the co-creation of scientific agendas and scientific contents”. The European Commission Horizon 2020 Interim Evaluation conducted in 2017 shows that 11% of projects are RRI-flagged, representing a contribution of 2.7 billion euros (14% of Horizon 2020 budget). Nevertheless, when measuring the involvement of Civil Society Organisations in Horizon 2020, the figures are much lower: just 2.7% of Horizon 2020 participants are ‘real’ CSOs, and they receive just 0.7% of all funding (Galiay, 2017).

The Horizon 2020 Interim Evaluation nevertheless concluded by saying that the “results are encouraging in terms of the embedding of [...] Responsible Research and Innovation in Horizon 2020, even if highly uneven across the programme”. Furthermore, in the ‘Summary of key remaining challenges’, it underlines (Point 3.) that “there is a need for greater outreach to civil society to better explain results and impacts and the contribution that research and innovation can make to tackling societal challenges, and to involve them better in the programme co-design (agenda-setting) and its implementation (co-creation)”.

Lang (2017) isolated some challenges for RRI in Europe to include pressure to find solutions to future societal challenges; the complexity of research, scientific and technological developments being linked to opportunities and risks; societal acceptance and/or rejection of technological developments and products; and that science, research, and innovation evaluation criteria do not take into account external factors and impacts.

There are a few thorny issues with the potential to blight the RRI firmament. Hiney (2017) indicated one of these as research integrity, which she notes to be everything: ethics, design, good research practice, scientific publication and public discourse, among others. In the absence of integrity, research misconduct creeps in, cases of which were reported in the medical and pharmaceutical fields as being more common than others in the sciences.

Hiney (2017) further asserted that research integrity is now discussed in a way that would have been unimaginable 20 years ago and many international initiatives and organisations are engaging in the discussion. Products and impacts of these efforts include the Council of Ministers - Conclusions on Research Integrity; changes in the European Commission’s policy and contract clauses since FP6; and since 2013 the number of European countries that have developed (or are developing) national CoCs, guidelines and policies has increased significantly. We now turn to the African context in relation to the SDGs and RRI.

Agenda 2063 and the SDGs: The Congruence

The seven aspirations of the African Union’s Agenda 2063 have direct and indirect links with the 17 SDGs. For instance, aspiration No. 1- *A prosperous Africa based on inclusive growth and sustainable development*, has goals that are connected with all 17 SDGs. For the purpose of this paper, the first four SDGs will be selected as examples of this relationship, after which the role of RRI in the pursuit of the goals will be described, drawing lessons from practice in Europe.

We begin with SDG Goal No. 1 on ending poverty in all of its forms everywhere. This is congruent with Agenda 2060 which anticipates “...empowerment of the poor and the vulnerable, particularly in the rural communities and the urban informal economy, the unemployed and the underemployed by enhancing their capacities through education, skills and vocational training and retraining of the labour force, access to financial resources, in particu-

lar micro-financing, land, infrastructure, markets, technology and services in order to meaningfully integrate them into the labour market.” (AU, 2015).

Moving on to SDG No. 2, the African Union has set a target to “eliminate hunger and food insecurity by 2025.” Both the Agenda 2063 and the African Union Summit decision on Accelerated Agricultural Growth and Transformation have reaffirmed this commitment. This is in alignment with SDG No. 2 on ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture.

Nearly one in five people living in Africa are hungry. That rate has decreased steadily since the mid- 1990s, with the fastest decline in West Africa, while the lowest undernourishment rate is in Northern Africa. Unfortunately, the total number of undernourished Africans has risen since 1991, largely driven by increasing population. East Africa has the highest levels of hunger in terms of both prevalence and absolute numbers—about half of the total undernourished population of the continent is in its Eastern region (Anyanwu and Anyanwu, 2017).

SDG 3 (ensure healthy lives and promote well-being for all at all ages) aligns with the Agenda 2063 which envisions that African “citizens are healthy, well-nourished and have long life spans”. Note that in the march to attain SDG 3 and the relevant provisions on health in the Agenda 2063, Africa has made huge strides in reducing child mortality, improving maternal health and fighting HIV/AIDS, malaria and other diseases. Since 1990, there has been an over 50 per cent decline in preventable child deaths globally. Maternal mortality also fell by 45 per cent worldwide. New HIV/AIDS infections fell by 30 per cent between 2000 and 2013, and over 6.2 million lives were saved from malaria.

Despite this incredible progress, more than 6 million children still die before their fifth birthday every year. About 16,000 children die each day from preventable diseases such as measles and tuberculosis. Every day, hundreds of women die during pregnancy or from child-birth related complications. In many rural areas, only 56 per cent of births are attended by skilled professionals. AIDS is now the leading cause of death among teenagers in sub-Saharan Africa, a region that is still severely devastated by the HIV epidemic.

SDG No. 4 is on inclusive and quality education. In congruence, the Agenda 2063 calls for investment in Africa in inclusive and quality education that promotes entre-

preneurship and innovation with a special focus on the teaching and learning of science and technology. The continental education strategy for Africa (CESA) has taken over from the Second Decade of Education for Africa that ended in 2015. The content of the CESA is a reflection of Africa’s contribution to the global Education 2030 programme, and constitutes Africa’s implementation framework for Sustainable Development Goal number 4.

The education sector in Africa has recorded steady improvements over the years. Attendance of primary school is becoming the norm, with most countries having achieved universal primary enrolment (above 90 per cent). Nearly half of African countries have achieved gender parity in primary schools. However, a few challenges remain in terms of quality of education, completion rates, secondary and tertiary level enrolment, reform in the educational system and curricula, teaching capacity and infrastructure (AU, 2015).

While public expenditure on education has steadily increased over the years, much still needs to be done in terms of investments in higher education, education infrastructure, strategic planning and reform of education curricula in order to make them relevant to the skills required by the labour market, and overall quality enhancement (AU, 2015).

What Role for RRI?

With the dots joined between the SDGs and Africa’s Agenda 2063, let us now look at some roles that RRI can play in the implementation process. We turn to von Schomberg (2017), who underlined four key priorities- stakeholder involvement: involve end-users early on; choose societal objectives with stakeholders and society at large; open access to research data and ample access to resources.

Now we draw on characteristics of RRI in defining the roles. The major characteristic is that it puts the needs of ordinary citizens at its centre. Here, with the examples of the four SDGs, the ordinary citizen’s need is to be elevated out of poverty, hunger, disease and illiteracy; and sustainably so. First things first, using the tools of RRI we should have public engagement on the concept and dimensions of poverty, hunger, disease and illiteracy. Public engagement means reaching out to all, rich and poor; hungry and well-fed; healthy and sick; literate and illiterate in languages they can understand and collectively agree on the research and innovation process. Will the outcomes address their needs? Will the process be undertaken responsibly?

For SDG1 in Africa, RRI has roles in probing the magnitude of the key factors feeding the incidence and depth of poverty in the region including high income inequality and illiteracy. On the other hand, the key drivers that significantly reduce poverty in the region will need to be collectively probed through RRI. These include higher levels of economic development (income per capita), higher general government expenditure on end consumption, higher official development care and aid received as well as urbanisation.

What further roles can RRI play in the quest to reduce poverty in Africa and meet SDG Goal No. 1 and the related target of the Agenda 2063? By way of baseline information for such RRI efforts, estimates from the World Bank suggest that the share of the African population in extreme poverty did decline—from 56 per cent in 1990 to 43 per cent in 2012. At the same time, however, Africa's population continued to expand rapidly. As a result, the number of people living in extreme poverty still increased by more than 100 million. These are staggering numbers. Further, it is projected that the world's extreme poor will be increasingly concentrated in Africa (Beegle, Christiaensen, Dabalen, and Gaddis (2016). Also note that seventy-five per cent of the world's poorest countries are in Africa, including Zimbabwe, Liberia and Ethiopia. The Central African Republic ranked the poorest in the world with a GDP per capita of \$656 in 2016. According to Gallup World, in 2013, the 10 countries with the highest proportion of residents living in extreme poverty (defined as living on \$1.25 or less a day) were all in sub-Saharan Africa (Beegle, et al; 2016; Anyanwu and Anyanwu, 2017).

The lesson to be learned from Europe's Horizon 2020, where RRI is the focus, is for Africa to ensure greater outreach to civil society to better explain results and impacts and the contribution that research and innovation can make to tackling societal challenges relating in this case to poverty (as well as other SDGs), and to involve them better in the co-design (agenda-setting) and implementation (co-creation) of the programme.

The role of RRI in SDG 2, which aims to end all forms of hunger and malnutrition by 2030, is to apply the same tools highlighted earlier in ensuring multi-stakeholder involvement in the process from start to finish; ensuring relevance, transparency and responsibility. At the end of the RRI process, we need to ensure all people – especially children – have access to sufficient and nutritious food all year round. This involves promoting sustainable agricultural practices: supporting small scale farmers and allowing equal access to land, technology and markets. It also

requires international cooperation to ensure investment in infrastructure and technology to improve agricultural productivity.

SDG 3 and the Agenda 2063 make a bold commitment to end the epidemics of AIDS, tuberculosis, malaria and other communicable diseases by 2030. The contribution of RRI will be to work with all stakeholders using time-tested RRI tools to attain universal health coverage, and provide access to safe and affordable medicines and vaccines for all. Supporting research and development for vaccines is an essential part of this process.

Notwithstanding the steady progress on the health front, Africa is still faced by the world's most dramatic public health crisis, and to which RRI should turn. The World Health Organization, in its 2014 report, indicates that HIV/AIDS continues to devastate the region. More than 90 per cent of the estimated 300–500 million malaria cases that occur every year are in Africa, mainly in children under five years of age, but most countries are moving towards better treatment policies. Most African countries are making good progress on preventable childhood illnesses such as polio and measles, through increased immunization coverage. However, some hurdles still remain, including the high rate of maternal and neonatal mortality, and the strain on African health systems from life-threatening communicable diseases coupled with increasing rates of non-communicable diseases.

RRI efforts in the region should be directed at strengthening the fragile health system. Since it has been realised that insufficient funding is still one of the most significant threats to the health systems in the region, RRI through mobilisation of partners should have outcomes that will unveil resources that will be needed for the health systems to respond effectively to life-threatening communicable diseases (for instance, the high prevalence of HIV/AIDS), and non-communicable diseases (including cancers, diabetes, hypertension and coronary heart disease), which are set to rise over the coming decades. Sustainable development programmes that improve or preserve the quality of water, air and other environmental goods and services will lower the national health budgets and ensure a healthy labour force.

On SDG 4 on quality education, RRI should focus on how to ensure effective learning environments; building and upgrading of capacities of teachers; education facilities that are child, disability and gender sensitive and providing quality basic and higher education as well as vocational training.

Closing Thoughts

Although roles have been identified for RRI in Africa towards the attainment of the SDGs and Agenda 2063, several challenges still loom. One is the high level of illiteracy in the region. RRI expects most, if not all, members of the community to be consulted and to partake in the RRI decision-making process, but there is a limit to how much illiterate persons can be part of this process. This challenge can be scaled, at least in part, by using RRI tools in the local languages.

The second challenge is the paucity of persons or groups in Africa with an understanding of RRI protocols. This is why GUNi-Africa was excited to host the first Higher Education Institutions Responsible Research and Innovation (HEIRRI) training workshop in October, 2017, led by Amelia Larkins. Now the trainees will be trainers for RRI workshops scheduled for 2018 through 2023 by GUNi-Africa in its strategic plan. In another five years, a good stock of persons trained in RRI will begin to be part of the Africa regional space.

The third challenge relates to research integrity, which Hiney (2017) pointed out as a feature of RRI in Europe. RRI in Africa will be plagued by a similar issue of academic fraud. This phenomenon is global and Africa is not spared, but it is being addressed through a region-wide GUNi-Africa project on combating academic corruption.

It needs to be stressed in closing that the view of development that profiles Africa as beleaguered has of late, started to crumble, what with the high-performing economies of many African countries and increasing entrenchment of democratic governance. Sadly, however, the ignominious performance of Africa in its contribution to the ever-growing stock of knowledge in science and technology still has yet to crumble. Like mist in the early morning sun, Africa's early lead in science and technology enterprises at the dawn of civilisation has largely vaporised. There is an urgent need to re-awaken the sleeping giant in the fast-paced, science and technology-dominated world of the 21st century through contributions to high-impact research, especially using RRI tools (Okebukola, 2015).

There are at least four interlocking factors that explain the weak contributions of African universities (scholars) to the global scientific literature. Chief among these is the scant political will among national and regional leaders to implement grandiose plans to support universities in contributing to the knowledge economy through research, especially in science and technology. Leaders are more

motivated by the political narrative that development plans will present to a largely illiterate citizenry than by the visible impact on development of faithfully implementing such plans. This triggers and weaves into the second factor of under-resourcing of university research. This low level of funding or investment in research infrastructure and grants has slowed the wheel of progress in scientific and technological research in the continent. The third factor is the increasingly weaker capacity of young African scholars to conduct research using modern techniques and methodologies and of old scholars who are stuck in the rut of their out-dated techniques and are unable to use new methods and emerging technologies. Add the disproportionately heavy engagement of African university scholars in teaching rather than research (owing, among other matters, to enrolment massification) and you have a cocktail of variables under whose weight the expected contributions of African scholars to global scientific literature is buckling. So what are the key sustainable strategies for sharpening Africa's teeth to ensure that researchers can access and contribute to the global body of knowledge, especially in science and technology and using RRI?

As envisaged by Okebukola (2015), in ten years, Africa's current contribution to the global scientific literature can be scaled up by a factor of three through a number of interventions. The first direction is research capacity building. There is the need to draw from the Africa regional fund for research in science and technology to run annual, intensive, capacity-building (training) workshops on contemporary research techniques, for cohorts of science researchers at national and sub-regional levels. In the last five years, specks of such research capacity-building efforts have been dotted all over Africa, and which have had a feeble impact on bolstering overall national and regional contributions to the global science and technology research literature. What we need is a combination of the inverted pyramid and pulsating models of capacity building. Rather than bring together an undifferentiated mixture of researchers for training in modern methods of research as is the current practice in several African countries, we should segment researchers into the weak and the strong, thereby leading to a pyramid which we can invert in terms of training, first, the weak and then the strong. If we pulsate this through a sustained rate of annual training with a mixture of local and international experts as was done with such success at Lagos State University, Nigeria, African countries will be on a steady course to hike their contributions to the science and technology literature.

Enhanced access to global scientific literature is a second direction in which to turn as a prop to catalyse contributions of African universities to the same literature that they should be helping to build rather than being a parasitic consumer. Through negotiations with providers at the national level, the cost of bandwidth to universities can be lowered to enhance internet access, which in turn will stimulate access to and contributions to online resources. Governmental actions to make this happen, as we find in Ghana, Ivory Coast, Kenya, Namibia, Nigeria, Senegal and South Africa, and support from external agencies and donors to lower the cost of bandwidth should go beyond the transient, sinusoidal wave of such interventions (up one day, down the next) to more sustained action, perhaps backed by some legal provisions that will guarantee affordable bandwidth for uninterrupted high-speed internet usage.

With these interventions in place, the future of RRI in Africa will be bright, and therefore also the chances of attaining most of the SDGs and the African Union's Agenda 2063.

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From Narratives of Control to Narratives of Participation

Jordi Pigem

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The implementation of the Sustainable Development Goals obviously requires major changes to technical, organizational and educational issues. These will not be truly possible unless they are accompanied and supported by a paradigm shift. As the opening statement of UNESCO's Constitution says, "Since wars begin in the minds of men, it is in the minds of men that the defenses of peace must be constructed". Unsustainability also begins in the mind. The unsustainability crisis is a tangible expression of a major cultural crisis, a crisis of meaning and values, a crisis in the narratives that tell us who we are and what we are here for. To overcome our current crisis of civilization and to move into sustainable societies we need new narratives, new ways of seeing who we are, what our place in the world is and how deep the webs of relationships are that sustain what we are and what we do.

Towards More Sustainable Narratives

Our current, unsustainable narratives are tied to individualism, consumerism, materialism and control. Narratives of control have implicitly permeated Western culture since its early days and on occasion have been stated explicitly and unambiguously. In the very first chapter of the first book of the Bible, we read: "Fill the earth with people and bring it under your control. Rule over the fish in the ocean, the birds in the sky, and every animal on the earth".³ Just over half a century ago, on 26th December 1966, Professor Lynn White gave a lecture in Washington at which he related our will to wield power over nature with the Biblical narrative of the Creation. In 1967, he published an article in *Science*, «The historical roots of our ecologic crisis»,⁴ that has generated endless debate ever

3 Genesis 1, 28 (CEV [Contemporary English Version] by the American Bible Society).

4 Lynn Withe, "The Historical Roots of Our Ecologic Crisis", *Science*, vol. 155, issue 3767 (10 Mar 1967), pp. 1203-1207, DOI: 10.1126/science.155.3767.1203. It is worth noting that in his article Lynn White defined himself as a «churchman», he called for «an alternative Christian view» and proposed Saint Francis of Assisi as «a patron saint for ecologists».

since. Even if many theologians, and recently Pope Francis himself, have suggested other softer interpretations of this passage, the fact remains that the original text uses a Hebrew verb that clearly means "to subdue, bring into bondage". This verb, *kabash*, is used fourteen times in the Old Testament, always with violent meanings.⁵

In the same way that one can be a Christian and be alarmed by this passage in Genesis, one can also very much appreciate the value of modern science while acknowledging that one of the key cornerstones of modern science and of the whole modern Western mind, Descartes' *Discourse on Method*, is equally explicit about the will to subdue nature. With the new method he was advancing, Descartes hoped that we would become like «masters and owners of nature».⁶

Two and a half millennia after the Book of Genesis and almost four centuries after Descartes, it is clear that narratives inviting us to subdue nature are not working. They are bringing us not only to an increasingly unsustainable world but to the very brink of socio-ecological collapse. In 2015, Pope Francis' encyclical *Laudato si'* put it in these unambiguous terms: "Doomsday predictions can no longer be met with irony or disdain. [...] our contemporary lifestyle, unsustainable as it is, can only precipitate catastrophes, such as those which even now periodically occur in different areas of the world".⁷

We need new narratives that can usher us into a post-materialistic, post-industrial post-patriarchal and more participatory world, beginning with the realization that reality is made not of isolated objects but of dynamic relations. Higher education shall play a crucial role in the development of these more sustainable narratives.

Where shall we start?

Exactly half a century ago, at a speech in New York on April 4th, 1967 (a year, to the day, before he was assassinated) Martin Luther King Jr. declared: «We [...] must undergo a radical revolution of values. We must rapidly begin the shift from a "thing-oriented" society to a "person-oriented" society. [...] A true revolution of values will soon cause us to question the fairness and justice of many of our past and present policies». A "thing-oriented" society is very much a society based on narratives of control, whereas a "per-

5 See the major reference works for Biblical Hebrew, such as Strong's dictionary [3533]. The other Biblical passages using this term are 2Ch 28,10; Ne 5,5; Jr 34,11; Jr 34,16, and Est 7,8.

6 René Descartes, *Discours de la Méthode*, VI: «[...] et ainsi nous rendre comme maîtres et possesseurs de la nature».

7 *Laudato si'*, § 161.

son-oriented" society would be a much closer society to the values of environmental and social justice we seek. We should note that for Martin Luther King this shift was something that should be undertaken "rapidly" ... fifty years ago! In the half century that has elapsed since his words there is no doubt that we have made important steps towards a more "person-oriented" society. And yet, at the same time, we have made no less significant steps towards a more "thing-oriented" society: our collective imagination is now busier than ever with consumerism and all kinds of gadgets. All too often we feel that people are treated as things, as cogs or replaceable units at the disposal of the economic or technocratic system. But human dignity stems from the fact that every person is unique and irreplaceable. A thing-oriented society is necessarily dehumanizing –and unsustainable.

From Thing-oriented Materialism to Relations-oriented Post-materialism

We could argue that the main philosophical conclusion of over 100 years of quantum physics is that the world is not made of things, it is made of relations.⁸ Today we know that quarks, leptons, bosons and other elementary particles are not like billiard balls, but are ephemeral and profoundly entangled phenomena. For centuries we believed reality was made of solid, separate, thing-like particles. In the mainstream media, due to our cultural inertia, subatomic particles are still portrayed as separate things, even though at the frontier of science, we know that relations are more fundamental than things.

Therefore, we can define two contrasting paradigms, one seeing things as more fundamental than relations, the other seeing relations as more fundamental than things. In the first paradigm, in our understanding of reality we will focus on what is (or seems) static and isolated and we will lean towards uniformity and homogeneity. In the second paradigm, we will focus on what is dynamic and interdependent and we will value diversity over uniformity.

"thing-oriented" paradigm	"relations-oriented" paradigm
static	dynamic
isolated	interdependent
uniformity	diversity

8 I argue this in Jordi Pigem, *La nova realitat / La nueva realidad* (Barcelona, Kairós, 2013), sections 40-48.

The shift from a thing-oriented to a relations-oriented perspective in contemporary physics has radical implications, which have yet to be fully explored and understood. It is noteworthy, for instance, that two great 20th century physicists, who were both awarded the Nobel Prize, Schrödinger and Wigner, both felt compelled by the results of quantum physics to suggest that the ultimate basis of reality has a mental rather a material character, i.e. that consciousness and perceptions would be primary and matter secondary.⁹ As the British physicist Sir James Jeans wrote in 1930, "the stream of knowledge is heading towards a non-mechanical reality; the universe begins to look more like a great thought than like a great machine". More recently, an article in the most prestigious of scientific journals, *Nature*, ended with this radical conclusion: "The Universe is immaterial – mental and spiritual. Live, and enjoy".¹⁰

A shift towards less materialistic and more participatory or post-materialistic values has also been detected, particularly in industrial, Western societies by sociologist Ronald Inglehardt et al, who have been working since 1981 with the data from the World Values Survey. There has been a consistent switch from materialist values, emphasizing economic and physical security, to post-materialistic values, which instead emphasize self-expression, personal and political autonomy, political participation, ecological awareness, social awareness (solidarity, non-discrimination, acceptance of diversity), quality of life rather than standard of living, and intangible goods such as family, community, leisure, justice, art appreciation, and following one's own calling.

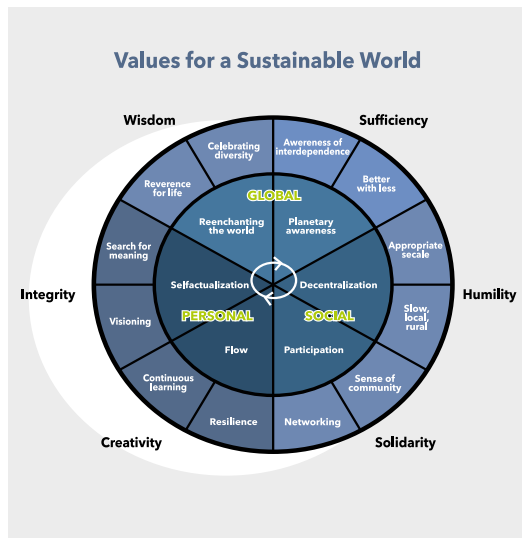
It is easy to see how the thing-oriented paradigm fits well with materialistic values and narratives of control, while the relations-oriented paradigm goes hand in hand with post-materialistic values and narratives of participation:

"thing-oriented" paradigm	"relations-oriented" paradigm
static	dynamic
isolated	interdependent
uniformity	diversity
materialistic values	post-materialistic values
narratives of control	narratives of participation

9 Erwin Schrödinger, Epilogue to *What is Life?*; Eugene Wigner, *Symmetries and Reflections*, Cambridge: MIT Press, 1967, pp. 153-199.

10 Richard C. Henry, "The mental Universe", *Nature* 436, 7th July 2005, p. 29.

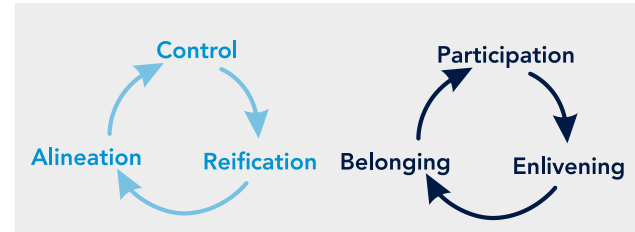
Post-materialistic values are very much the values we need to move into a more sustainable world. The values that counteract our current unsustainable dynamics are the very same ones that contribute to personal fulfilment and social cohesion. On the other hand, materialistic values are neither good at the global level (they are inherently unsustainable), nor at the personal level (consumerism leads to alienation rather than to genuine fulfilment), nor for society (they reduce social cohesion by fostering extreme individualism). Ultimately, there is a convergence of what is good (or bad) at the global, personal and social level, as I tried to show in this “GPS” (GlobalPersonalSocial) of values for a sustainable world:¹¹



From Control to Participation

Narratives of control generate a kind of vicious circle. Everything gets more and more reified (reduced to thing-like characteristics), and the more reified our world appears, the less we can feel at home in it. The more reified the world is, the more alienated our experience tends to become. And the more alienated and lost we feel, the more we will strive for control to regain some kind of footing in a world seen as alien. On the other hand, narratives of participation generate a kind of virtuous circle. The more we participate in our communities, in our societies and in the world, the more enlivened we feel and the more we experience a sense of belonging, all of which encourages us to participate further in building a new society and a new reality:

¹¹ Jordi Pigem, *GPS (GlobalPersonalSocial): Valores para un mundo en transformación* (Barcelona, Kairós, 2011).



These two feedback loops are like two possible avenues we might follow in everything we do. As Martin Luther King said, “Every man must decide whether he will walk in the light of creative altruism or in the darkness of destructive selfishness”. Every person, at every moment, chooses whether to walk in the darkness of destructive selfishness or in the light of creative altruism, whether to foster narratives of control and reification or narratives of participation and enlivenment.

Narratives of participation should lead us to a more sustainable, more socially harmonious, more fulfilling and more meaningful world. It should be a world with very different world-views and priorities. The evolution of scientific and humanistic knowledge invites us to visualize a world in which we would see:

Reason at the service of Intuition,
the Analytic at the service of the Holistic,
Information at the service of the Imagination,
the Quantitative at the service of the Qualitative,
the Methodical at the service of the Spontaneous,
the Tangible at the service of the Intangible,
the Mechanical at the service of Life,
Power at the service of Love.¹²

As the Catalan thinker and poet Joan Maragall wrote in 1911 in his “In Praise of Living”:

Enthusiasm, that is the mark of living. To want enthusiastically is to love. And to love, that is to live. To love to the point of giving ourselves for that which we love. To be able to forget oneself, that is being oneself. [...] Love your profession, your calling, your star, love that for which you are good, that in which you are truly one amongst men. Strive in what you do, as if on every detail of what you think, on every word you utter, on every piece you set, on every beat of your hammer, depends the salvation of humanity. Because it does depend on it, believe me.

¹² Adapted from Jordi Pigem, *Jordi Pigem, La nova realitat / La nueva realidad* (Barcelona, Kairós, 2013), section 54.

The Young People Who Will Lead the World are Female

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I am not aware whether the organisers of the workshops have noticed, but the only debating panel made up entirely of women was that on *Young people in action: new voices for the Sustainable Development Goals*. It is no small matter. Neither is it a coincidence. At the great United Nations forums and among the general public where this international agenda has been put together, and which must guide the steps of the international community towards a better, fairer, more peaceful and more egalitarian world by 2030, there are undoubtedly more female voices, even though the ones that are taking the centre stage are male. There are many signs that suggest that this is going to change. Certainly, if they are allowed, the panellists here have shown that they are not only involved in achieving change, but that they are more than capable of assuming the leadership towards the horizon that we're aiming for. Even better: their drive and the quality of their arguments lead us to believe that we really are able to go at least a long way towards achieving the future proposed by the 2030 Agenda 2030 that today might seem utopian.

And so the best thing would be to report what they themselves said.

"We are the biggest of all minorities", stated 24-year-old Miriam Hatibi. The spokesperson for the Ibn Battuta Foundation, an organisation that provides social, cultural, educational and labour support to people originating from diversity and thereby make them European citizens in every right, demanded not only that women, but young people in general, should be heard. "I ask that young people not only be invited to attend debates between young people. We should not be invited as if it was to do us a favour, but because we have something to say. Young people are not new voices. They are key voices. A lot of talent is wasted because not enough time is spent listening to us." There is no doubt that this was a very clear message directed at the organisers and the title of the debate at which her words were spoken. She was not the

only woman to make the same demand over the course of the afternoon. And it was one that did not fall on deaf ears, for she was told several times later on in the day that young people's participation would be handled differently on future occasions.

Her words touched on issues that are already widely present at other similar forums: that young people are fundamental for laying the foundations in the present for what will be built in the future. In short, they are not disciples of or replacements for the people that govern the world today, but real stakeholders in our present time, with valuable ideas that cannot be ignored in these times of difficult challenges. "We are creative. We don't think about the consequences" she argues. "That might be bad, but it can also be positive in some senses."

She followed that by putting forward a crucial issue in the current context, with such complex and multiplying conflicts all around the planet and more refugees than ever before in history: How do we create the creators of peace? "We need to take young people to the frontline and get them to be activists", she suggests. "They are told about the problems, but never about how they can be part of the solution". Hatibi was not wrong, being someone who not only stressed this criticism but also provided solutions. For example, she referred to the young children recruited by terrorist groups, just a month after Barcelona, the city where the conference was being held, was the victim of a brutal attack in which 15 people were killed and a further 130 injured. "When we talk about radicalisation, it is happening much faster than we think because we aren't doing anything to stop it" she says. "Why don't we go to Instagram, instead of a panel like this? Conversations about universities, for example, don't have their audience here, but on social networks. We have to innovate in the way we communicate with young people. Her demands were summarised by the four points that she read out in her talk: We need to change the narrative, create activists, speak to young people about the models to observe, foster dialogue between peers and give them space to innovate.

Meriem El Hilali, diplomatic advisor to the Secretariat of the Union for the Mediterranean (UfM), highlighted that the importance of listening to young people and giving them a voice is especially relevant in a region like the Mediterranean, where two thirds of the population are young people aged between 15 and 29 years. "They make up a very important proportion" she says. It is one so large that it cannot be ignored and that can form part of the solutions to the problems that are being implemented in this

part of the world. El Hilali went on to give a presentation of the facts: 2.8 million young people enter the labour market every year, but unemployment among them can reach rates as high as 20% or even more, and up to 50% among women. "This is happening on both shores of the Mediterranean," she explains, pointing out cases like Spain and Greece where the economic crisis has hit the youngest segments of the population hard since 2008.

With all this data on the table, the UfM representative ended by asking: What is youth? When does one become an adult? What does one need to do to become one? Many factors influence this, explains El Hilali, such as achieving financial independence, and living with one's parents or not. "But when we speak of young people, we cite them using a hashtag, as if they were all the same or would act in the same way" she says. "And that's not true." The same diversity that we demand should be recognised among adults should also be granted to new generations. "Young people experience different realities and face different challenges" she adds. What they do have in common, she notes, is that they are connected, and much more so than their parents were. "If we treat this as an opportunity, we can work with young people."

"A number of young people don't work, and don't study either, and there are more of them every year" she warns. "They aren't part of anything, statistically speaking. But they must be doing something. And that something is, to put it one way, 'looking at their computers', reading people's messages." That's where they can be found and shown, as Hatibi indicated earlier, new models, and peers that share their same culture and speak their language, with whom they can converse about climate change, immigration and other topics.

With this exposition of what youth and its realities are, El Hilali went on to highlight the two questions that, in her opinion, are essential when discussing young people. The first is education. As she herself admits, this is nothing new and nothing that hasn't already been said at millions of other forums. In fact, Sustainable Development Goal number four is a call to "ensure inclusive and quality education for all and promote lifelong learning". But no matter how much this is repeated, we cannot stop reiterating the importance of this challenge that many consider to be the most powerful for achieving all of the others.

The diplomatic advisor to the UfM explained it thus on the basis of her own experience on two of the programmes run by the organisation for which she works: with an education, many people not only obtain work for companies,

but also set up their own businesses. "The idea is not just to create your own work, but also to create a company that can create jobs for the people around you," she notes. That way, young people with an education not only make their own lives better but also become agents of change in their surroundings.

The second question that she underlined was the creation of young people's networks, which they organise and which need to be pragmatic. So, for example, they can be focused on specific causes related with the Sustainable Development Goals. Of all these, El Hilali considers the fight against climate change to be the one where young people have the most to offer.

At the end of the eight minutes of her talk (and another eight afterwards), El Hilali passed over to Beth Button. A former member of the executive committee of the European Student Union and currently studying for a Masters in Education Policy and International Development at the University of Bristol, she had prepared a talk in a notebook that she only glanced at now and then as a reminder. This brilliant young lady knows only too well what she is talking about because she formed part of it. Her curriculum is proof of that. When studying education and sociology at Cardiff University in the United Kingdom, Button was appointed education officer on its student union in 2012. From there, she went on to be elected deputy president of the National Union of Students Wales in 2013 and it president in 2014, where she spent two years representing more than 350,000 students and running campaigns on education issues. But it didn't end there: while on the student union, Button directed the organisation's work on the Sustainable Development Goals, with special emphasis on involving students in their monitoring and implementation, and representing the students at a series of UN and UNESCO meetings on the development agenda.

In short, Button told of her experience with this work and stressed the importance of young people, and students in particular, having a role in university governance. Her experience and talk are proof that young people should indeed not only be heard and receive messages, but should also be true agents of change.

23-year-old Tamires Gomes Sampaio is very clear about the change she wants. Far from dedicating her allotted time to repeating similar ideas to the ones already presented, Gomes surprised us with a talk focused on objectives and the means for achieving them. "The SDG are about what we are doing now to achieve the future that they propose," she explained. And she wants to see and

be part of a major change in her country, Brazil. "Half the population are black, but it is a very racist country" she insists. "70% of the people in prison are black and they also have a three times higher chance of being murdered. And if you are a woman it's worse because there is gender violence to add to these problems."

She has a degree in Law and a Masters in Political and Economic Law from the Universidade Presbiteriana Mackenzie, one of the oldest private institutions in Sao Paulo, "because I received a grant" she explains. She states that: "we cannot speak of sustainable development if I, my people, the black people ... are dying". It is therefore her proposal for the Sustainable Development Goals to include one dedicated to racial equality. It is too late for that, but Gomes is working so that, even though nothing is written on paper, this should become a shared battle in the international community.

I have left Marga Gual Soler's talk until the end because it's such a good way to end this summary of the debate on *Young people in action: new voices for the Sustainable Development Goals* with a bang, even though she was not the last person to speak. Her talk that day was nothing less than brilliant. And I have no doubt that she left many of us stunned and with a number of new ideas in our minds.

"I am going to talk from the scientific perspective", she said after a brief presentation in which she didn't forget to mention that she is from Mallorca. In addition to that, and more importantly, Gual is project manager at the American Association for the Advancement of Science (AAAS). "Something I have not heard today is how science has a part to play in achieving the Sustainable Development Goals" she said. It had indeed not been mentioned, but that was precisely why she was there. Gual, who early on in her career dreamed of working in a laboratory, ended up working at the UN's ECOSOC, thanks to a grant. "There weren't many scientists working there. But how can you fight against hunger, climate change, epidemics... without scientists on your staff? They do have advisors who always end up going back to university. Who transfers their recommendations to policies?" That was how Gual got into the world of diplomacy. And as a young, female scientist, she demands her "place at the table." She projected a photo on the screen of herself at the World Science Forum in Budapest. "It's like the Davos of science", she commented. She demands a place, and for other women to be there too, not just because a certain organiser wants to cover for a quota of young people and woman on the panel, but because

she deserves to be there, because she is prepared and, most of all, because she has a lot to offer.

Recapitulating on all of the interventions, it is easy to see what these female leaders revealed the people in the auditorium. For sustainable development and the projected world of 2020 to be possible, young people not only need to have a voice, but they also have to be actively heard. They are also a source of talent and ideas that could be a response to the biggest problems of the present day. But a lot of them need support, role models, new communication and their own challenges. And, to close the circle, girls and women need to be given the roles that they deserve. It is no coincidence that all of the speakers were women, or that the great youth leaders are women - I could cite the example of one the best known cases: Malala Yousafzai. The Sustainable Development Goals will be driven by them, if they are allowed and if we can break the glass ceiling that young people and women will face on the way. They are not lacking in value or worth and now, as Gual demanded, they do indeed need to be given their place at the table. Because that is what they deserve. And sustainable development will not be possible if they are only considered as receivers of help, as objectives in themselves, and not as agents of change. At the end of the day, they are the largest part of the planet's population.

The Global Governance of the Sustainable Development Goals

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The global governance of the Sustainable Development Goals (SDGs) is probably the greatest political mission ever assumed by the United Nations, but also the most balanced, overarching, and promising political endeavour to deliver a better world to future generations. For the first time since the emergence of global governance, public institutions, the private sector and civil society have been provided with a programme to guide global political action in a legitimate and sustainable way.

The challenges faced by this mission are huge, and refer to a series of general issues. Amongst these are obstacles and burdens to be overcome for the global governance of the SDGs. Also, the contemporary transformations derived from globalization entail consideration of major implications. Another notable issue is the designation of the precise institutions and mechanisms required for the global governance of the SDGs, which affects the way participation is channelled for all stakeholders involved in the political process. Last but not least, the governance of the SDGs poses difficulties for the articulation of the levels of action required in the effective implementation of policies. Together with these general issues, a plethora of more specific issues are involved in the challenging mission of the SDGs, such as the aspiration of gender equality, the articulation of North-South cooperation, and the potential contributions of information and communication technologies (ICTs), to name but a few.

But the relevance of all these issues for the global governance of the SDGs should not overshadow the extraordinary contribution that this plan will make to global governance as it has been portrayed since the end

of the 20th century.¹³ “Governing without government” stems from the need to manage the emerging global public domain beyond the will and capabilities of governments in the contemporary phase of globalization (Ruggie 2004). This need has been channelled through governance arrangements of very diverse forms, from formal organizations to looser policy networks (Koenig-Archibugi 2002), all of them coexisting in multiple decision-making sites and fashions described as multilevel governance (Zürn 2010). These arrangements have often mainly served the interests and preferences of powerful groups at the expense of those of weaker sectors of society. This is a hegemonic and neoliberal version of global governance, a reflection of a liberal world order and US dominance which is driven by considerations of efficacy and efficiency in transnational spaces such as global markets, as some observers have questioned (Smouts 1998; Ba & Hoffmann 2005). As a political project, this conception of global governance raises serious doubts in terms of democratic accountability (Papadopoulos 2010), and certainly seems far from legitimate according to any democratic standard.¹⁴ The SDGs represent the best opportunity to turn global governance into a legitimate political mission, instead of reproducing it as merely the efficient management of markets driven by the power and competence of private agents.

As a political process, global governance comprises all the phases of policy-making in a political system, such as framing and agenda-setting, selection and design of proper institutions, rule-making and policy making, rule

13 In the discipline of International Relations, James Rosenau (1992) introduced the concept defining it in broad terms as “systems of rule at all levels of human activity... in which the pursuit of goals through the exercise of control has transnational repercussions” (Rosenau 1995: 13), and later as “spheres of authority... at all levels of human activity... that amount to systems of rule in which goals are pursued through the exercise of control” (Rosenau 1997: 145). Such definitions would be qualified, among many others, by Lawrence Finkelstein, who proposed a narrower approach: “Global governance is governing, without sovereign authority, relationships that transcend national frontiers. Global governance is doing internationally what governments do at home.” (Finkelstein 1995: 369). In a similar vein, the Commission on Global Governance defined global governance as “the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest” (Commission on Global Governance 1995: 2-3).

14 As put by Jürgen Habermas (2006: 78): “Deficits of legitimation arise whenever the set of those involved in making democratic decisions fails to coincide with the set of those affected by them”.

enforcement and policy implementation, outcome monitoring and evaluation, as well as dispute adjudication. In contrast with policy-making in domestic and intergovernmental contexts, here private actors and authorities have assumed a leading role or share key functions with public actors and authorities. This is happening because, in the absence of governmental will or capacity, big companies, business associations, Non-Governmental Organizations (NGOs) and other private agents have exercised their power and competence to face what each of them considers to be transnational or global problems, challenges, risks, and threats.

Competence vs Legitimacy in Global Governance

In global governance “competence” implies three distinct resources. First, material capabilities, the material resources needed to ensure the proper provision of public goods in a particular issue or field of activity. Second, expertise understood as the scientific, technical or specialized knowledge contributing to the provision of public goods in a particular issue or field of activity. Third, executive abilities comprising diverse resources such as leadership, skills, contacts and access to networks, allowing for the optimal use of other available resources to obtain previously defined aims.¹⁵

In different issue-areas, each of these categories of competence is potentially relevant, but it should be stressed how decisive specialized knowledge has become, due to the complex nature of globalization processes, in a growing number of key global governance areas. Expertise in specialized domains is often in the hands of private agents, which have or gain easy or direct access to the management of issues of global public interest, either directly or through the activities of expert committees, advisory bodies, working groups, etc., or even broader epistemic communities (Haas 1991). This participation in the policy-making process should not be understood as merely technical, since there is very frequently a strong political dimension to it. This is rarely underlined by the me-

dia, and rarely understood by public opinion, which means that citizens and stakeholders in many issues are simply unaware of how affairs are managed in the global public domain. The relevance of epistemic authority has greatly contributed to the growing power and influence of private actors and authorities in global governance activities, and has rightly led some to describe them as “governors”, since what they effectively do is to govern -with or without governments involved in the process (Avant, Finnemore & Sell 2010).

But being competent or powerful in global governance is different to being legitimate. Actually, there is inherent tension because epistemic authority has tended to replace, or overlap with, democratic legitimacy: “Authority and legitimacy are no longer founded on democracy, but on the inherent necessities of science and technology. Political values are replaced by scientific necessity. Modern technology requires no further legitimation, despite the fact that it is used to govern” (Warning 2009: 181). Partly following David Beetham (1991), we hold that democratic legitimacy in global governance stems from three dimensions. First, normative legitimacy is the result of consensus on values, when such values, principles, and norms reflect broad public interest needs and preferences. Second, social legitimacy is provided with representativeness and inclusiveness, when policies and decisions are the result of the proper representation and participation of a broad social base. Third, Political legitimacy or accountability is fulfilled when agents participating in global governance account for their actions, which implies the use of specific accountability mechanisms, namely, standards of behaviour, access to information, and sanctions against violations (Grant & Keohane 2005). When these mechanisms are absent or precarious, as frequently occurs in global governance, we see the creation of accountability gaps (Keohane 2003), where power asymmetries allow powerful private actors and authorities to operate without control or to escape accountability filters that public authorities are normally subject to in democratic contexts. When the global public interest is subordinated to private interests in absence of accountability mechanisms, we are faced with abuses of power (Grant & Keohane 2005), and global governance becomes illegitimate. What the SDGs offer is the opportunity to bring governance arrangements in line with democratic legitimacy by engaging all stakeholders (public and private) in a common endeavour with promising incentives for all.

¹⁵ These resources are traditionally viewed as resources of power, although there are numerous ways to conceptualize them. As put by Robert Cox (1981), the triad of resources comprises material capabilities, ideas, and institutions. The similarity of this framing with the one presented here is obvious, although there are some notable differences: on the one hand, Cox’s “ideas” is a wider category than “expertise” (and even “executive abilities” may be part of such “ideas”); on the other hand, Cox’s “institutions” are considered here as resources of legitimacy, not of competence.

The SDGs as a Legitimate Programme for Global Governance

Some observers like Jan-Gustav Strandenaes stress the extraordinary potential of the SDGs to transform international politics through the 2030 Agenda for Sustainable Development. This programme is the result of more than 50 years of research and knowledge development on economic, social, and environmental issues. Such experience offers us the possibility to guide future transformations according to sustainable development principles, at affordable economic costs, and with the only limitations of our own political will to fully deploy the plan. The 2030 Agenda entails 17 SDGs, 196 targets and 230 indicators, all of which should be deployed on the consideration that they are: a) integrated, interlinked, and indivisible; b) people-centred and planet-sensitive; and c) universal -applying to all countries while recognizing different realities and capabilities. Thus, it is worth stressing that sustainable development consists of three interlinked dimensions (economic, social, environmental) and that all future measures and policies should be organised and planned, always and at every level, according to this integration. This must be a permanent element of the equation when dealing with governance, participation, planning and implementation. In contrast to the Millennium Development Goals (MDGs), which were only aimed at the so-called developing countries, the SDGs are of concern to all countries and must be implemented by all countries.

Such a broad scope poses some challenges for governments, civil society and the private sector. At the governmental level, policies will only be taken seriously if governments engage in intergovernmental cooperation. At the level of civil society, people must feel that any development initiative is owned by themselves, not imposed top-down. And at the level of the private sector, businesses should perceive opportunities for making profits, and not just limitations on the free operation of markets. Needless to say, all of this requires the adoption of partnerships between governments, private sectors and the people, where all stakeholders feel that their legitimate interests are properly taken into account, represented, and defended.

According to Jan-Gustav Strandenaes, these three sectors hold highly diverse degrees of influence, interest, ability and preparedness regarding the implementation of the SDGs in the local, national, regional, and global spheres of activity. Certainly, not all governments, businesses and civil society groups share an equal footing for the future implementation of the SDGs, and nor will they

equally benefit from them. However, the SDGs and the 2030 Agenda represent a new, comprehensive, holistic and overarching planning tool that should be exploited for impact assessments, materiality analysis, risk analysis and opportunity analysis, and not merely as a reminder of what we have done to show how 'good we are' by ticking the boxes. We may face some obstacles, like poor knowledge, a poor understanding of knowledge, difficulties grasping the integral nature of the SDGs, some misunderstandings in relation to the underlying values, and difficulties assuming the indivisibility and universality of the SDGs. These are mainly obstacles for civil society groups and NGOs, since these often lack the resources, expertise and abilities to make effective contributions to the multiple levels of global governance. They often even lack a clear understanding of the possibilities offered by the SDGs.

But for those engaged in this programme, there are now more opportunities than ever before. Many businesses have grasped these by promoting causes and initiatives that effectively and legitimately contribute to better global governance practices. A good example may be the SDG Leadership through Reporting, launched in 2016 by the Global Reporting Initiative (GRI) and the United Nations Global Compact launched in 2016 with the aim of promoting and advancing corporate reporting on the SDGs. Many NGOs have also contributed in an effective and legitimate manner to improving governance in some critical areas, such as environmental protection, either independently or in partnerships with governments and intergovernmental organisations (IGOs). It is also worth noting the engagement of many IGOs in the implementation of the SDGs. Even some of those struggling with the difficult balances of geopolitics have assumed relevant commitments. According to Emmanuelle Gardan, from the Union for the Mediterranean (UfM), it is possible to promote the SDGs through projects in such diverse areas as water and the environment, energy and climate action, business development, higher education, social and civil affairs and transport and urban development. There are now endless channels of participation at all levels of governance. They should be understood and they should be used before some governments feel uncomfortable with criticisms and make moves to close down participation.

Here lies a special responsibility for academia and some civil society sectors with the knowledge and the ability to deliver both effective and legitimate outputs throughout the policy-making process of global governance at all levels. The SDGs are unknown to most people in the world, they are invisible in the local and national politics

of most countries, and they will be irrelevant unless they permeate all societies and all policy-making levels. The SDGs represent the best framing and agenda-setting exercise of global governance that we have ever had. We needed them, and we have them now. The governance of the global public domain cannot only be determined by resources of competence, and particularly specialized knowledge. Beyond efficacy and efficiency in global markets, political action should fulfil democratic legitimacy and aspirations, and a critical understanding of what is at stake is essential for better global governance frameworks, policies, and decisions. What the SDGs bring is a guide for action, a bridging programme for competent and legitimate global governance, and a promise of a better world.

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The New Economy

Jordi Verdú

UAB coordinator for the Education Innovation Program Digital & Green Skills for a Sustainable Economy and Visiting Professor in the Wireless Communications research group

The Panel Session

The panel session was composed of Jordi Pietx (Regional Manager in Catalonia, Balearic Islands and Valencia at Ecoembes), Mounir Temmam (Founding Director of Enviro Consulting International), Ken Webster (Head of Innovation at the Ellen MacArthur Foundation), and Jordi Verdú (Singular Project Coordinator at Universitat Autònoma de Barcelona). So, the different profiles present in the discussion provided a wide range of different points of view of important aspects of economics.

Jordi Pietx presented Ecoembes as an organization that cares for the environment through recycling and eco-design of packaging in Spain. The objective is to give a second life not just to plastic, cans and cartons, but also to paper and cardboard packaging. The important issue is to understand recovery as a process based on co-responsibility, involving all of society's stakeholders. New Economy is not a straight line; it needs to be circular, i.e. to re-introduce assets at some stage of the value chain. This must be supported by eco-design and innovation, which are the origin of an asset. Depending on how the asset is designed, it will be more easily re-introduced to the value chain. This will make a major contribution to social transformation, the need to change habits and the way that we understand such co-responsibility.

Mounir Temmam is the Founding Director of Morocco-based Enviro Consulting International, whose main activities are related with advising decision-makers in multiple fields related to sustainable development. The context of the region requires a focus on more general projects in terms of the SDGs, namely the promotion of waste-to-energy in Morocco, feasibility and ways of setting up recycling and recovery clusters for waste from electrical and electronic equipment, and the development of a solar energy fuelled Electric Rapid Transit Bus system in the city of Marrakesh. The main contribution to the SDGs is the provision of strategic advice to decision makers, needs assessment, and the building of the necessary capacities for such a purpose.

Ken Webster offered his point of view about the circular economy as an industrial system that is restorative by design, and a system that emphasizes natural capital and maintains the system long term. The focus is on the design stage of the value chain, which needs to fit the system, in order to get the most out of it. In this regard, and in keeping with the idea of the circular economy, the loop has to be closed in order to move away from traditional production systems. So, recycling should be the final resource that closes the loop. Society would seem to be under major pressure to close the loop by recycling, but the focus should be on the design itself, and designers need to take this into account a priori. In addition, the cost of assets should be consistent with the real cost, while also considering the recycling cost of a certain asset.

Jordi Verdú presented the vision of the new economy from the academic point of view. Academia's challenge is to transfer the required competences to students (not only at university, but also in primary and secondary education). The UAB, together with the Vallès Occidental County Council and Eurecat, developed a program focused on graduate students called Digital and Green Skills for a Sustainable Economy. The participant students came from very different backgrounds (Technological, Business, Human Sciences...) and the idea was to teach them the basic capabilities from a technical, but also "green", point of view, to make them agents of change and therefore able to apply the concepts of circular economy to their future work. The program does not claim to train technological or green experts, but merely to provide students with broad knowledge of the possibilities. This idea may have already been exported to university, where some transversal competences could be defined (no matter what the students' background) in relation with the SDGs.

Introduction

The changes that have taken place in recent years are visible through the major transformation our society has been immersed in. It seems that we are currently witnessing the birth of a new concept of economy where possession comes after consumption. In this new economy, we stop being users to become consumers: why buy a new car or a new washing machine if what we need is to make a trip or a commute and clean clothes?

New technologies are again playing a predominant role in the transformation of the economy. Smart phones

have given way to several business opportunities related to mobile applications. These applications are an effective, accessible and really useful tool for accessing specific services in the new paradigm of the consumer citizen. It seems that the concept of buyer will die out in the near future.

We must ask ourselves to what extent this new framework can affect the SDGs Agenda. The current global economy requires global agreements and shared global governance. How can the new economy help to achieve a more sustainable society? We must insert a new concept in our society: reuse. The circular economy has been consolidated as a key element in order to achieve those objectives.

There are several ways to define the concept of circular economy. First, it can be defined in contraposition to the classic linear models where assets are created, consumed and finally discarded. This is also known as “take, make and dispose”, which is related with the current extractive industrial model. The circular economy is restorative and regenerative, and what is most important, this is done by a proper design. Its objective is to redefine products and services to eliminate waste, while minimising negative impacts. Underpinned by a transition to renewable energy sources, the circular economy model builds economic, but also natural and social capital¹⁶.

The Impact of the New Economy on the Achievement of the SDGs

Traditional models rely on large quantities of cheap and easily accessible materials and energy that are pushing the environment to its physical limits. From this point of view, it is being assumed by society that the achievement of the sustainable development goals may be based, among others, on the development of new economic models with a philosophy based on the circular economy. So, the question could be addressed at how the impact must be defined.

The application of circular economy models entails the reform of a major part of the system of human activity, including both production processes and consumption activities. In the first case, economic and environmental impact indicators can be defined, while for the second case, the need for social impact indicators is required.

In relation with environmental impact, there are several studies in the literature giving this information. For

example, at EU level, it is estimated that improving EU resource productivity by 3% would lead to a reduction of 25% in GHG emissions by 2030¹⁷. But studies of specific processes (recycling, reduction of waste, etc...) have also been developed, such as the study by the European Environmental Bureau (2014) where the impacts of improved resource efficiency on GHG emissions reductions, on food waste reduction, avoiding water use, avoiding fertilizer use and avoiding land use were modelled.

Economic impact is normally measured by the creation of additional jobs. The Cambridge Econometrics and BIO Intelligence Service (2014) estimated that improving the EU's resource productivity by 2% could help to create two million additional jobs by 2030. The growth of productivity by 3% by 2030 can also be achieved with innovations in mobility, food systems, and built environment sectors combined with organisational innovations. As discussed in the introduction, the development of new technologies has been the key to activating such alternatives.

Finally, the social impact indicator is perhaps the least intuitive, since it would be desirable to have more information available on aspects such as gender, skills, employment, welfare, poverty and inequalities. However, there is one aspect that could be relevant: the proliferation of collaborative networks and platforms. This entails a major change in relationships, and in how society is organized. In collaborative networks, new self-governance models arise out of this self-organization, which generally tend to be more inclusive and democratic since they come directly from society (bottom-up).

Another important aspect related with the impact of the circular economy on the SDG's is the discussion of enablers and burdens. The role that the society is playing today is perhaps the most important enabler. As previously discussed, the proliferation of collaborative platforms thanks to the latest technological developments is pushing the community towards a state of greater consciousness and the feeling that something has to be changed to deal with this uncontrolled consumption of resources. At the same time, speaking from the point of view of burdens, the responsibility of sustainable consumption is focused on society. This is partially true, but it is unfair not to consider other important aspects. The design process is a very important step in the value

¹⁶ Ken Webster. “The circular economy: A wealth of flows”.

¹⁷ V. Rizos, K. Tuokko, A. Behrens. “Circular Economy: A review of definitions, processes and impacts”.

chain that must be considered. The responsibility cannot be focused on society if they have to deal with poor designs, and if they need to have the knowledge required to select assets depending on how they are designed. A possible solution to this would be to show the real cost of the assets to the population, and the real cost should take into account the cost of recycling or eliminating the parts of the asset that cannot be reinserted into the value chain. It should be designed a priori in consideration of a closed loop, and by putting all the effort into avoiding the use of recycling to close the loop.

Key Technological Developments in the Evolution of the New Economy

Technology has been the most important enabler of new business models, particularly the circular economy. Thanks to technology, the most important aspects for the proper control of an asset are available, i.e. knowledge of the allocation, availability and performance at a certain moment. By controlling these properties, the use of an asset can be maximized, but its lifecycle can also be extended because of regeneration or recirculation.

Of course the internet of things plays a very important role in this. The evolution of the required sensors to properly control assets has been exponential in recent years, achieving high-performance devices at a very low cost. This has also been key in several business models for the transformation of products into services. For example, we have the case of Philips, and what it has been called “Pay-per-lux”, where rather than selling bulbs, what is sold is the electricity service. This has reached very important infrastructures, such as Schiphol Airport in Amsterdam. By doing this, companies must improve the performance of these bulbs, and also consider how they can re-include the different parts of the asset in the value chain. Several successful cases can easily be found in the literature.

But there are also some limitations that arise from the evolution of the internet of things. The first comes from the management of the generated data. The International Data Corporation (IDC) carried out a study sponsored by Seagate (April 2017)¹⁸ whereby the prevision is to evolve to 160 Zettabytes by the year 2025. For the better understanding of the reader, in 2016 the total data traffic achieved 1.3 Zettabytes, which is equivalent to 38 million of DVD per hour. Security and privacy is also a big challenge from the technological point of view, i.e. how to authenticate the information, how to encrypt the information, detection of intrusion in real time, and everything

¹⁸ IDC's Data Age 2025 study

related with the protection of devices and applications. Finally, there is a global challenge: standardization. Several institutions are working on achieving their own standard property. Of course, all the different institutions involved in this have a particular interest. The point then is whether it is possible to work on the achievement of a global and unique IoT standard?

Participation of Society in this New Economic Model

The role of society in pushing the circular economy towards a wider presence has been briefly mentioned. However, this was done from the point of view of a society as a group of organized people (collaborative platforms), but it is no straightforward matter to think about the participation of a single individual in this economic model. It may be quite hard to tackle the problem of how an individual can be connected with other agents to this end. So, the search for such connections leads us to the quadruple helix model¹⁹. This model states that in an innovative process, the four main actors must be present: society, academia, administration and industry. This is the space where the individual has no main role, but rather a role that is equally important as that of the other three actors. The individual will be a partner but also a stakeholder. The individual can be the tester of a certain solution, but he/she may also be the one that makes a certain problem visible that was not contemplated by any of the other actors. This is where the individual can empower him/herself.

The success of this model is based, among other aspects, on the availability of a physical space, or a network of available physical spaces, such as living labs, fab labs, social innovation networks, open data labs, etc. This is the meeting point where the four actors must interact. And one of the challenges might be to provide a common language for all of them. All the actors must understand each other in order to achieve the final objective. From this point of view, the role of academia is very important. Schools and, more importantly, universities must accommodate the new scenario. And all of them should be able to provide a certain transversal competence (digital, green, innovative, etc...) to the community, whatever the education background. For example, there is the singular program carried out at the Universitat Autònoma de Barcelona, with the Consell Comarcal del Vallès Occidental and Eurecat named Digital and Green Skills for a Sustain-

¹⁹ European Union - Committee of Regions. “Using the Quadruple Helix Approach to Accelerate the Transfer of Research and Innovation Results to Regional Growth”.

able and Circular Economy²⁰. The purpose was to provide basic digital and green competences to students of different educational backgrounds with the aim to make them “agents of change”, so they are able to use the circular economy as the basis for their future jobs.

The program is composed of three main blocks. The first is focused on digital and green competences, i.e. programming, IoT, 3D fabrication, EcoDesign and sustainable consumption. The objective is to provide the elementary tools to the students so they can have an idea about what is possible today, and also to allow them to interact with other agents (from a technological point of view) when they are faced by a specific challenge. To do this, the second block was focused on the development of an open innovation platform. Here the students formed groups of five and each had a challenge to face. The groups were multidisciplinary in an attempt to offer a broader view of the challenge. And finally, the third block was focused on transversal competences, such as leadership, innovation culture, gender view or working in groups. The results have been satisfactory since the objectives on labour insertion were accomplished. But it has also been a useful experience for learning how academia can participate in offering knowledge to the population with that aim.

catalyse innovation processes where academia, administration, industry, and also society have a common interest.

Conclusions

One of the new economic models, the circular economy, promotes a more efficient use of the available biological resources for the production of different assets. But it also promotes a circular loop where used assets can be re-introduced to the value chain at different stages. In this sense, the aim is to convert business models based on products into business models based on services. This has been accelerated in recent years thanks to the latest technological developments, mainly in the field of the internet of things.

But this new economic model must be an inclusive model from the social point of view, promoting equality among citizens in terms of gender, poverty, skills and welfare, among others. Society is a very important player for closing the loop, and this is seen in the proliferation of collaborative platforms.

To achieve this, it is crucial to empower individuals, to provide them with the necessary intellectual and material tools to side with the philosophy behind the circular economy. Physical spaces such fab labs may be the places to

²⁰ www.digital4circular.com

Circular Knowledge Economy:

Towards Sustainable Skills and Innovation

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Abstract

This article exposes some systematic problems with the educational and skills system available to citizens in cities today. We argue that a fundamental change is needed to enable a true Smart City. To this end, we introduce the novel concept of a Circular Knowledge Economy.

Introduction

Developments around Smart Cities have traditionally focused on technology and services for the city and citizens. Very advanced technical solutions, architectures and approaches have thus been introduced over the past decades to cities, with varying success of take-up.

For instance, the Internet of Things (IoT) has been introduced into many cities allowing for smart and real-time decision making to improve the efficiency for city operations and well-being for citizens; example applications are smart parking, smart street lightening, smart bins, etc, etc. The information is being carried in real-time via advanced wireless cellular and fibre infrastructures, to be processed and acted on at platform level. An underpinning agenda of this all are advanced technology standards which enable inter-operability between different technologies and even families of technologies.

It seems an ideal world. Yet, it does not feel that urban living has become significantly smarter. There seems to be a missing link in the chain. Smart Cities need smart pop-

ulations who can take advantage of new opportunities offered by advanced infrastructure. Investments in education, skills building and networking, etc is equally important if not more important. Yes, very little talked about in the context of Smart Cities.

To this end, the article is structured as follows. In the subsequent section, we outline a few burning issues in education and skills. After that, we introduce what we believe to be a pioneering concept, i.e. the notion of a "Circular Knowledge Economy". Finally, the article is concluded.

Where Are The "Leonardo's"?

We have achieved something rather remarkable over past centuries: we have streamlined education. Billions have gone through a refined primary schooling system, then secondary schooling, then undergraduate and then post-graduate university degrees.

Yet, where are the "Leonardo's"? Where are those who fundamentally disrupt this world? We should have billions, yet are left probably with less than during the Renaissance. Why has stagnation settled in, despite all our efforts across countries and times to improve education and skill setting? The answer is manifold, and briefly discussed below.

First, the educational and skills systems are too siloed to achieve the degree of innovation and creativity observed at the height of the Renaissance. Indeed, there is a very clear separation of subjects at school and degrees at university; music does not mix with engineering, law not with biology, etc. And the siloes are not only vertical, but also both horizontal: there is very little interaction between primary, secondary schools and universities.

Second, the entire system is far too static. Whilst there is appetite to adapt current educational systems, they are heavily regulated, often treated as consumer "products" and thus suffering from long cycles of change. That is highly detrimental as accelerated innovation also requires accelerated change in education and skills support.

Third, there is far too much administration involved (at least from the university perspective). This in turn hinders creativity as energy is diverted into trivial tasks which could, in most cases, be automated or solved in a different manner.

The result of above is that the exciting "Leonardesque" education is done in parallel with our official streamlined education. The exciting things happen in after-school clubs, or with private tutors, or with the societies at universities, etc.

The current system does simply too little to prepare students for lifelong learning and self-directed innovation. For example, students outside engineering are being trained in outdated 19th / 20th century hierarchies and linear production processes. They need to learn how to develop collaboratively, iteratively and nimbly - changing course according to shifts in direction of human societal evolution. Further, we fail to train students in entrepreneurship, basics of accounting, investment and marketing to run themselves as small businesses that own their own intellectual property.

Circular Knowledge Economy

We believe that we need to move away from the notion of a linear streamlined educational and skills model. We propose and introduce herewith the notion of a **Circular Knowledge Economy**.

The concept is heavily based on findings of the Circular Economy where the streamlined production model is broken to allow for valuable physical assets to be re-used and, circularly, re-introduced into the value chain. In our opinion, knowledge and skills are very valuable assets and ought to be given the same importance (if not more) as physical assets.

Underpinned by Figure 1, we translate the findings of the circular economy to the circular knowledge economy. Upstream knowledge is created through school and university education, which leads to startups and corporate working life. Importantly, to close the circle, we advocate for start-ins (a term originally coined by Stephen Hilton, Bristol) where an innovative idea is implanted into large corporates leading to a "start-up from within", i.e. a "start-in". Furthermore, we require corporate knowledge to flow smoothly back into the educational system.

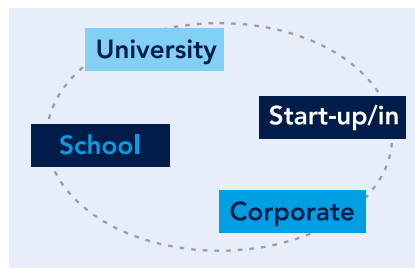


Figure 1. A visualization of the concept of the Circular Knowledge Economy.

Let's bring the discussions back to the context of Smart Cities: During the transition from Industry 3.0 to Industry 4.0, time to market has become a critical factor in com-

mercial success. A Smart City should thus have all the components ready for assembly:

- ◆ planning & urban upgrades against multiple time horizons for short, medium and long-term projects;
- ◆ education system that produces graduates who are able to navigate the cross-disciplinary worlds of technical innovation, creative product development, and commercial finance;
- ◆ investment environment based on trust, accessibility & rapid response to opportunities;
- ◆ infrastructure as a service that lets businesses 1) sandbox environments to conduct R&D, fast prototypes in real life situation; and 2) acquire top-grade delivery systems that start small with minimum exposure but scale overnight to meet demand;
- ◆ modular software components that can be quickly assembled into new products and services with customisation; and
- ◆ responsive urban environment that provides housing, workspaces and recreation / cultural amenities with minimal friction.

We believe above notion of a circular knowledge economy will enable this and thus form an underlying pillar of education and skills development.

Concluding Remarks

In this article, we have highlighted the problems in modern education systems which directly impact the well-being of smart cities. We have introduced the foundations of an entirely novel concept, i.e. the one of a Circular Knowledge Economy.

The aim is to create a systematic educational and skills system where both creativity and innovation are stimulated simultaneously and applied across different fields. It ought to help with the mismatch between skills and labour markets.

Delivering Water and Sanitation Services in the 2030 Agenda for Sustainable Development

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Summary

Water and sanitation are at the very core of sustainable development: the 2030 Agenda includes a goal that sets out to “ensure availability and sustainable management of water and sanitation for all” (SDG 6). SDG 6 has strong linkages to the other SDGs. Safe drinking water and adequate sanitation and hygiene are pillars of human health and wellbeing. Water is also needed for food, energy and the production of industrial goods in highly inter-connected and potentially conflicting ways. Non-properly managed wastewater puts healthy ecosystems at risk, which are crucial to keep the quantity and quality of freshwater, as well as overall resilience to climate change. Integrated water resource management is essential in order to harness synergies as well as to manage potential trade-offs, to ensure availability and sustainable management of water and sanitation for all.

This paper builds and expands on the lessons learned during the parallel session entitled “SDG 6: Clean Water and Sanitation” of the International Conference on Sustainable Development Goals: Actors and Implementation, held in Barcelona, Catalonia from 18th to 19th September 2017. It takes the interlinked and interdependent nature of SDG 6 as its starting point, and discusses the challenges for successful fulfilment of the global targets dedicated to water, sanitation and hygiene (WaSH). This is needed, since there is otherwise a risk of adopting a fragmented approach - investing time and resources in trying to implement isolated and limited development initiatives -, without addressing the existing and still open sets of questions on how best to provide universal WaSH services.

Introduction

Water and sanitation are at the very core of sustainable development, critical to the survival of people and the planet. Safe drinking water, adequate sanitation and hygiene are integral to our social, environmental and cultural commons, being pillars of human health, human dignity and well-being.

In September 2015, the United Nations Member States committed themselves to ensuring universal access to safe drinking water and to sanitation in Goal 6 of the 2030 Agenda for Sustainable Development - SDG 6 (United Nations General Assembly, 2014). The achievement of this Goal requires adequate investment in infrastructure, provision of sanitation facilities, and hygiene promotion at every level. Protection and restoration of water-related ecosystems such as forests, mountains, wetlands and rivers is also essential to mitigate water scarcity. And more international cooperation is needed to encourage water efficiency and support treatment technologies in developing countries (United Nations World Water Assessment Programme (WWAP), 2015).

The 2030 Agenda stresses the universal, interdependent and mutually reinforcing nature of the SDGs (United Nations General Assembly, 2015). It is recognised that the achievement of the 2030 Agenda and its Goals and Targets will only be possible through an integrated approach. Therefore, fully understanding and managing the linkages, that is, maximizing synergies and minimizing trade-offs by working across traditional institutional structures, are key challenges for many governments and development partners (UN Water, 2016a). However, important interactions and interdependencies are generally not explicit in the description of the goals or their associated targets, and they require adequate identification (Griggs et al., 2017).

In particular, both A. Jiménez (2017) and E. Bergés (2017) stated in their intervention that many of the SDG targets related to social and economic development both depend on and support a sustainable, reliable water supply of adequate quality and quantity; therefore, these targets and the targets under Goal 6 are interdependent (Griggs et al., 2017; UN Water, 2016a). There are strong linkages between Goal 6 and the social dimensions of sustainable development (UN Water, 2016a). For instance, clear synergies exist between the targets of universal access to water supply, sanitation and hygiene (WaSH) services [Targets 6.1, 6.2] and wastewater treatment [6.3], and reducing multidimensional poverty [Goal 1], improving nutrition [2], and achieving universal access to health

[3] and education services [4]. There are also strong interdependencies between the economic dimensions of the 2030 Agenda and Goal 6 (UN Water, 2016a). An adequate and reliable supply of water [6.1, 6.4] is essential for many economic activities [8], infrastructure and industrial development [9], cities and communities [11] and sustainable consumption and production [12]. Access to WaSH services [6.1, 6.2] and wastewater treatment [6.3] also support a healthy, educated and productive workforce. Finally, water is a prerequisite to all life on Earth and the foundation of all of its ecosystems (UN Water, 2016a). To take one example, synergies are obvious between the Goals on consumption and production [12], oceans [14] and ecosystems [15], and Goal 6, especially with regard to water quality and wastewater management (reduction, reuse and recycling) [6.3]. And on top of that, implementing IWRM [6.5] mutually reinforces targets for awareness-raising on climate change [13.3], and integrating climate change and ecosystem values into development processes [13.2, 15.9]; while addressing climate change supports the targets for water scarcity [6.4], water quality [6.3] and ecosystems [6.6, 15.1].

In all, cutting across sectors and regions, water is instrumental in the implementation of integrated development solutions. However, its highly interlinked nature also makes the water sector fragmented, calling for a high level of coordination between a wide variety of sector and non-sector stakeholders. Moreover, indicators are sector-specific, and they will not provide the framework needed for an integrated approach across multiple objectives. As suggested by A. Jiménez in his presentation, a narrow focus on the indicators poses a risk to an excessive compartmentalization of development initiatives, which may broaden the existing gap between the indicators, the targets and the Agenda (Jiménez-Fdez de Palencia, 2017). It is therefore important not to lose sight of the scope and systemic nature of the global priorities and objectives, which are fundamentally interdependent (Griggs et al., 2017).

Building on this, this article further discusses the challenges for successful fulfilment of SDG 6. The focus is particularly on those targets dedicated to water, sanitation and hygiene (WaSH), which have been selected as initial case studies for various reasons. As cited above, increasing access to drinking water, sanitation and hygiene in homes, healthcare facilities, schools and workplaces underpins other development goals relating to end of poverty, healthy lives, gender equality, sustainable growth, reduction of inequalities and sustainable cities, among others (UN Water, 2016a, 2016b). In addition,

there is broad and growing support for the realization of the Human Right to Water and Sanitation (HRtWS) among UN member states (Flores Baquero et al., 2013; United Nations General Assembly, 2010). And despite significant progress in recent years, much still remains to be done: in 2015, 844 million people still lacked a basic drinking water service, and 2.3 billion people lacked improved sanitation facilities (Joint Monitoring Programme, 2017).

Monitoring drinking Water, Sanitation and Hygiene in the global agenda

The new dedicated goal on water and sanitation (SDG 6) expands the Millennium Development Goals' (MDGs) focus on drinking water and sanitation to cover the entire water cycle, including the management of water, wastewater and ecosystem resources. Specifically, this goal contains eight targets: six on outcomes, and two on the means of implementing these outcomes. Three out of six "technical" targets are proposed with a specific focus on drinking water, sanitation and hygiene, as summarized in Table 1. Targets 6.1 and 6.2 relate to drinking water and sanitation, respectively. Targets 6.2 and 6.3 expand the framework beyond the use of sanitation facilities to cover the full sanitation chain. In addition, two cross-cutting targets focus on the means to achieve the water and sanitation targets. Target 6.a expands international cooperation and capacity building support, and Target 6.b strengthens the participation of local communities in improving water and sanitation management.

In order to report progress towards SDG Targets 6.1 and 6.2, the need is proposed to build on and expand the existing water and sanitation "ladders" (Joint Monitoring Programme, 2015). In his remarks, R. Giné (2017) highlighted that key new developments include the establishment of a new higher threshold of service for drinking water and sanitation (termed "safely managed"), and the addition of a specific ladder for hygiene (handwashing). The proposed drinking water ladder distinguishes between safely managed services, basic services, unimproved and no service (surface water); sanitation is disaggregated into safely managed services, basic services, shared facilities, unimproved facilities and open defecation; and the hygiene ladder separately reports on basic facilities, unimproved and no facilities. The underlying idea behind improving service levels is not only to increase the number of people with access, but also to promote progressive improvements in the quality of services, based on the content of the human right to water and sanitation (Flores Baquero et

al., 2016; Giné-Garriga et al., 2017; Heller, 2017a; Joint Monitoring Programme, 2015). To put these ladders in a functional framework, global and national estimates of safe management of water and sanitation services will be computed by making the best use of available information. The intention is to generate “compliance” factors that, for instance, describe “the proportion of water technologies that are compliant with regulatory quality standards”; and also a number of “safety” factors that help estimate “the proportion of domestic wastewater (sewage and faecal sludge) that is safely managed and treated based on sanitation facility types used” based on “the proportion of untreated wastewater that enters the environment, including direct discharge into the environment, leakage during emptying and transportation, or inadequate treatment leading to unsafe disposal or reuse” (Joint Monitoring Programme, 2015). These factors will be assessed at a national level, and they will either come from actual country situations, literature reviews, focused studies or in-country consultation. They will ultimately be combined with country estimates on the use of various drinking water and sanitation facilities, derived primarily from household surveys.

Key Challenges in Delivering Water and Sanitation Services for All

The SDG targets for drinking water and sanitation imply a transformation in current approaches to service delivery. The underlying message, proposed by A. Jiménez in his speech, is simple: “we need to do things differently, and we need to do different things” (Jiménez-Fdez de Palencia, 2017). This section examines the main challenges faced by the international community for providing sustainable and equitable WaSH services for all.

The need for increased participation and stronger alliances between the public sector, the private sector and civil society

M. García started his presentation by noting that the sector needs improved cooperation and stronger alliances between the government and key sector partners, including the private sector and civil society (García, 2017). Innovative frameworks should therefore be promoted for policy dialogue and the exchange of project ideas, experiences and best practices among sector stakeholders. In this regard, large efforts have been undertaken in recent years to promote private sector participation in, and pri-

Table 1 Indicator framework for monitoring SDG targets on drinking water, sanitation and hygiene post-2015.

Target	Indicator	Key elements
Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all	Percentage of population using safely managed drinking water services	<ul style="list-style-type: none"> - a basic drinking water source (MDG “improved” indicator), - which is located on premises, - available when needed, and - compliant with faecal and priority chemical standards
Target 6.2: By 2030, achieve adequate and equitable sanitation and hygiene for all, and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	Percentage of population using safely managed sanitation services	<ul style="list-style-type: none"> - a basic sanitation facility (MDG ‘improved’ indicator), - which is not shared with other households, and - where excreta are safely disposed in situ or transported and treated off-site
	Percentage of population with handwashing facilities with soap and water at home	<ul style="list-style-type: none"> - a device to contain, transport or regulate the flow of water to facilitate handwashing
Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	Percentage of wastewater safely treated	<ul style="list-style-type: none"> - underscores the importance of treating wastewater as a dominant source of water pollution, and relates to wastewater generated both through households and economic activities. It will exploit, in part, information generated for the sanitation indicator of Target 6.2

Source: Joint Monitoring Programme (2015b) and United Nations General Assembly (2014)

vate financing of, the implementation of SDG 6 (Bergés, 2017). However, the debate on the role of privatization in promoting universal access to safely managed services has rarely adopted a human rights-based approach. It is necessary to ensure monitoring and accountability for all stakeholders and to strengthen the role of States as the primary duty bearers for guaranteeing the rights of individuals and communities.

In the same priority line, it should be pointed out that effective water and sanitation management depends on the participation of a range of stakeholders, including local communities. As A. Jiménez pointed out, Target 6.b deals with this priority issue (Jiménez-Fdez de Palencia, 2017). He explained how, according to the last Global Analysis and Assessment of Sanitation and Drinking Water survey, over three quarters of countries surveyed reported that procedures for stakeholder participation were clearly defined in law or policy (World Health Organization, 2017). However, effective levels of participation remain comparatively low: less than one quarter of countries report a high level of participation.

The need for governance, indicators and a coherent framework for global monitoring of SDG 6

The experience of the MDGs underscores the importance of thinking through the indicators as early as possible (Sustainable Development Solutions Network, 2015). Indeed, indicators will be the backbone of monitoring progress towards the SDGs at the local, national, regional and global levels. A lesson learnt from the MDGs is that we cannot manage what we do not measure, and what gets measured is far more likely to get done. It is therefore necessary to identify and apply specific, measurable and action-oriented indicators to turn the SDGs and their targets into a management tool to help countries develop implementation strategies and allocate resources accordingly (Hák et al., 2016; Sustainable Development Solutions Network, 2015).

As previously mentioned, Targets 6.1 and 6.2 call for universal access to drinking water, sanitation and hygiene. The key shifts necessary for transitioning from the MDGs to the SDGs include a focus on sanitation and hygiene, the reduction of inequalities, increasing service levels, addressing WaSH issues beyond the household, and improving the sustainability of services (Joint Monitoring Programme, 2015). Monitoring these targets therefore requires a significant increase in the data that is accurate, timely and available to governments, managers, civil society and international organisations. Despite the significant progress achieved during the MDGs, there are still

huge data and knowledge gaps to adequately address some of the biggest sustainable development challenges, and many people and groups are still uncounted (Independent Expert Advisory Group on a Data Revolution for Sustainable Development, 2014). It will take many years before the official SDG indicator framework is underpinned by comprehensive data (Sachs et al., 2016). And even when data are available, a major drawback is that they are often years out of date, hindering the capacities of countries to set priorities for early action (Sachs, 2012).

In his intervention, R. Giné summarized three main problems to address (Giné-Garriga, 2017), which have been largely discussed elsewhere in the literature (Heller, 2017b; Independent Expert Advisory Group on a Data Revolution for Sustainable Development, 2014; Joint Monitoring Programme, 2017):

There are not enough high-quality data. Today, too many countries still have poor data, data arrives too late and too many issues are still barely covered by existing data. In their last report, the JMP identifies major data gaps, and highlights that effective monitoring of WaSH services during the SDG era will require significant improvements in the availability and quality of data. To name but a few examples: i) multiple definitions of 'Open Defecation Free' hinders the establishment of comparable baseline estimates, ii) incomplete data on excreta management in on-site systems challenges accurate monitoring of Target 6.2, and iii) important data gaps also exist for sewered systems, such as the amount of excreta that is lost in transport, and the amount of excreta that bypasses treatment plants or is discharged without receiving at least secondary treatment (Joint Monitoring Programme, 2017). It is quite clear that governments will need to invest in a real-time reporting system for the SDGs to produce high quality data on a range of new issues, ensuring that no groups are excluded, with an unprecedented level of detail, and with no more than a yearly, if not quarterly, time lag (Independent Expert Advisory Group on a Data Revolution for Sustainable Development, 2014; Sachs, 2012).

Monitoring systems should be consistently aligned with the normative content of the human rights to water and sanitation and the principles of the human rights. This was clearly stated by the Special Rapporteur on the human rights to safe drinking water and sanitation in his speech (Heller, 2017a). There is thus a need to rethink indicators and indicator frameworks for measuring sustainable access to water and sanitation services and the enjoyment of this human right in an equitable manner. One illustra-

tive example is that affordability and equality should be treated as an integral part of the indicator's definition of "safely managed" services, and not as an additional, complementary aspect of monitoring (Heller, 2017b).

Data are not used in policy-making. To cover the link between data availability and data use, a huge increase in the capacity of many governments, companies, institutions and individuals will be needed to deliver and use this data (Sustainable Development Solutions Network, 2015). Data must be of high quality, at a level of disaggregation that is appropriate to the issue at hand, and must be made accessible to those who want or need to use them: experts but also government officials, business, practitioners and civil society, and of course, the public (Independent Expert Advisory Group on a Data Revolution for Sustainable Development, 2014; Sachs et al., 2016). In addition, in contrast to the MDG period - where no intermediate milestones were defined - the 15 years of the SDGs should include intermediate objectives and milestones with clear dates, in order to ensure closer feedback between policies and outcomes (Sachs, 2012).

The need for improved financing mechanisms

The success of the SDGs will need countries worldwide to invest adequately in addressing their challenges. On the one hand, the investments for sustainable development will not be heavy globally speaking, certainly not compared with the massive costs if no investment is made (Sachs, 2012). In particular, extending basic WaSH services to the unserved will cost \$28.4 billion per year from 2015 to 2030. This financing requirement is equivalent, in order of magnitude, to the 0.12 percent of global product spent to serve the unserved with improved water supply and sanitation during the MDG period (Hutton and Varughese, 2016). On the other hand, this relatively modest average cost as a proportion of global product hides wide variations across countries. Significantly greater capital spending is needed, for instance, in Sub-Saharan Africa, where meeting SDG targets on drinking water, sanitation and hygiene will require large investments in terms of finance and resources. Globally speaking, the World Bank has estimated that current levels of financing for WaSH are only sufficient to cover the capital costs of achieving basic universal services by 2030. Meeting SDG Targets 6.1 and 6.2 will require a tripling of capital investments to US\$ 114 billion per year, not to mention operations and maintenance (O&M) costs, which are key for sustainable services (Hutton and Varughese, 2016).

In this regard, in addition to the global costs - where the financing priorities are - the issue of service affordability

needs to be addressed, specifically for the poor. Households are likely to pay part or the full recurrent (O&M) costs, and tariff policies need to be balanced against affordability. Both M. García (2017) and E. Bergés (2017) indicated in their remarks that not all populations will be able to afford the water and sanitation tariffs, and thus targeted financing will be needed for those households. This may require a better selection of quality and affordable technology options than they now have (Hutton and Varughese, 2016). Moreover, failing to tackle inequalities globally will add hundreds of billions of dollars to the spending needed to end poverty: failure to tackle inequality will mean failure to deliver the SDGs (Martin and Walker, 2015). Therefore, additional efforts are required to reach vulnerable groups, including poor populations and communities living in remote areas or informal settlements. A large number of countries report having specific pro-poor measures in their WaSH policies and plans. However, the implementation of such concrete measures remains elusive: few countries are able to consistently apply financing measures to target resources to poor populations. Furthermore, while "reducing inequalities" was considered a very high priority for two thirds of external support agencies (ESAs), aid to basic systems (as a proxy for aid targeted at unserved populations, particularly in rural areas) was only 25% of WaSH aid disbursements in 2015. Increasing and sustaining WaSH access for vulnerable groups will not only be critical for achieving SDG 6, but also for other poverty-related SDGs (World Health Organization, 2017).

In financial terms, the MDGs relied on "voluntary" financing mechanisms, notably the foreign aid outlays voted by each parliament. However, very few countries have fulfilled the recommendation to give 0.7% of their gross national income (GNI) to official development assistance (ODA). It is against this backdrop that SDG 6 integrates one specific indicator to monitor the amount of water -and sanitation- related ODA that is part of a government-coordinated spending plan. Nonetheless, as recalled by M. García in his speech, the transition from the MDG to the SDG era calls for a notable departure from business as usual (García, 2017). The aspirational and ambitious goals and targets that make up the SDG framework requires a new take on development policies, plans and programmes, and on means of implementation (World Health Organization, 2017). At the same time, there is also a need to focus concessional flows on those countries with the greatest needs, i.e. low- and lower-middle income countries and countries in "special situations" - such as fragile and conflict-affected, least developed, landlocked and small island states (Martin and Walker, 2015). Other inno-

vative financing mechanisms will be needed to finance the SDGs, and countries should agree on transparent and specific standards of financing (Sachs, 2012).

Last but not least, there is a need for dramatic improvement in the effectiveness of financing, as it is not only an issue of increasing public spending. Public spending often does not yield the expected improvement in outcomes, particularly in countries where the level of governance is poor. Indeed, increasing public spending may be an easier policy option than attempting to improve governance, but in the absence of good governance, the easier option frequently does not translate into the expected achievement of better outcomes (Rajkumar and Swaroop, 2008).

The issue of inclusiveness: No one must be left behind

The 2030 Agenda focuses strongly on reducing inequality, with many goals designed to 'leave no one behind', and states that SDG indicators should be disaggregated, where relevant, by income, sex, age, race, ethnicity, migratory status, disability and geographic location (United Nations General Assembly, 2015). Similarly, from a human rights perspective, the concept of progressive realization has often been highlighted. For the SDGs, progressive realization of the human rights to water and sanitation means that all targets should be met in 2030, without leaving anyone behind and by reaching those who are furthest behind first (Joint Monitoring Programme, 2016). As recalled by the Special Rapporteur in his presentation, progressive realisation goes hand-in-hand with progressive reduction of inequality (Heller, 2017a).

The JMP has been monitoring inequalities in drinking water, sanitation and hygiene since 1990. In 2016, the JMP global database was restructured and expanded to incorporate new information required for SDG monitoring, drawing special attention to key human rights elements such as affordability, needs of women/girls and people in vulnerable situations (Joint Monitoring Programme, 2016). Their last report shows that there are not only significant inequalities in basic WaSH services and open defecation between regions and between countries within each region, but also within individual countries between urban and rural areas, subnational regions and wealth quintiles (Joint Monitoring Programme, 2017). For example, Angola has relatively high coverage of basic drinking water compared to other countries in sub-Saharan Africa, but there is a 40 percentage point gap between urban and rural areas and a 65 percentage point gap between the richest and poorest quintiles (Joint Monitoring Programme, 2017).

Remarkably, however, Targets 6.1 and 6.2 universally apply to all, and countries from developed countries will

also need to mobilize efforts to achieve these targets. A paradigm shift is advocated to define the poor and approach the most vulnerable segments of population. The case of Spain is given as an illustrative example. Based on official data (Joint Monitoring Programme, 2017; Sachs et al., 2016), this goal has already been achieved since 100% of the population are covered by improved water sources and improved sanitation facilities. In her speech, however, E. Bergés highlighted that the number of households at risk of water poverty has considerably increased in recent years due to the economic crisis (Bergés, 2017). The Spanish Association of Public Water Supply and Sanitation Operators (AEOPAS) carried out a survey in 2014 to calculate the number of disruptions to water supplies due to non-payment of bills. Results show that cut-off warnings amounted to more than 500,000, i.e. an increase of 30% compared with 2010; the number of disconnections totalling 300,000. As previously mentioned, affordability is likely to be a concern, especially for the poor. If operational costs cannot be covered by tariffs, policy makers and service providers should be aware of the increasing burden on limited grant financing and (cross-) subsidies to operate the services (Hutton and Varughese, 2016). In other words, local governments and the organisms that manage the water and sanitation services should implement a system of aids and subsidies in the water bill to guarantee that poor households benefit from the same high level of service.

In all, the pledge that 'no one must be left behind' requires a focus on the poorest and most vulnerable people, and particularly on reducing their exposure and vulnerability to extreme climate-related events and other economic, social and environmental shocks and disasters. For this to happen, a focus on strengthening resilience is needed to protect development gains and ensure people have the resources and capacities to better reduce, prevent, anticipate, absorb and adapt to a range of shocks, stresses, risks and uncertainties. On the one hand, public and private sector organisations will need to focus more on building the resilience of their infrastructure and systems to disruption from all risks. On the other hand, resilience of societies will need to be enabled and supported against all threats and hazards, in a way that communities and individuals harness local resources and expertise to help themselves during and after an emergency.

The need for increased accountability

A crucial element to promote and accelerate SDG results will be citizens holding governments and donors accountable. The raw material for accountability is high-quality data, providing the right information on the right things

at the right time (Independent Expert Advisory Group on a Data Revolution for Sustainable Development, 2014). For instance, data on public spending and revenue/aid in budget-related documents will allow civil society to track increases in 'means of implementation' for the SDGs (Martin and Walker, 2015).

It is remarkable that throughout the MDG period, the international community has conducted no comprehensive monitoring or analysis of spending. Accountability is expected to increase significantly as part of the data revolution needed to support the SDGs, and a number of initiatives have already been launched in recent years for monitoring public expenses and increasing budget transparency (e.g. Public Spending Observatories, Open Government Data, etc.). This is, in part, the role of the UN-Water Global Annual Assessment of Sanitation and Drinking-Water (GLAAS), i.e. to increase the information available to key decision-makers and thereby help to enhance accountability in the sanitation and drinking-water area. In turn, GLAAS should help increase spending levels, finding fraud and fighting corruption.

Conclusions

As we embark on the global journey toward sustainable development, it is vital for the 2030 Agenda for Sustainable Development to be integrated into national planning, and translated into policy at national levels. In this process, however, two preliminary issues should be taken into account: i) the Global Goals should enrich national policy and align with, rather than duplicate, national sustainable development plans; and ii) the focus should be kept on these global priorities, avoiding the risk of "compartmentalizing" the interlinked and interdependent nature of the Goals and the Agenda.

With a dedicated goal on water and sanitation, this paper adopts the position that achieving sustainable and equitable access to WaSH services will be extremely challenging. In particular, the aim of this paper is to explore the linking process between the SDGs and the targets under Goal 6, to provide a better understanding of the current and emerging challenges in respect of sustainable delivery of WaSH services. This is needed, since there is otherwise a risk of adopting a fragmented approach - investing time and resources in trying to implement isolated and limited development initiatives -, without addressing the existing and still open sets of questions on how best to provide universal access to safe drinking water, sanitation and hygiene.

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SDG 3: Good Health and Well-Being

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Worldwide health improvement and the reduction of healthcare inequalities are still among the greatest global challenges we are facing today, despite the progress made in recent decades. And this is in part because the progress in global health has been far from equal in different regions of our planet. In fact, there is a direct correlation between how long people live and the money they earn²¹. And this correlation is closely related with the fact that just 10% of global research is devoted to diseases affecting 90% of the population.

In this text, we summarize the debate at the roundtable held at the 2017 GUNi Conference on ensuring healthy lives and promoting well-being for all at all ages, which featured interventions by Rafael Vilasanjuan (Director of Policy and Global Development at the Barcelona Institute for Global Health - ISGlobal), Melitta Jakab (Senior Health Economist at the WHO Barcelona Office for Health Systems) and Paula Adam (Head of Research at the Agency for Health Quality and Assessment of Catalonia - AQuAS), with Pastora Martínez (Vice President for Globalization and Cooperation at the Open University of Catalonia) as moderator. Global health disparities, the international agenda action plan and their relation with research and innovation were the main topics discussed.

Starting with the international context, it is important to mention that the 90's were a critical decade for the Global Health Agenda. Despite some major failures, such as the AIDS pandemic, by the end of the decade much had been done to bridge the gap between innovation and access to medicines and health coverage²². In that regard, the Global Health Agenda between 2000 and 2015, also known as the health Millennium Development Goals (MDGs) approved by the United Nations, concentrated its efforts on maternal and child health outcomes, and infectious diseases such as AIDS and malaria. Since 2000, the MDGs have made it possible for more money to be

²¹ <http://ow.ly/sDKm1>

²² http://www.ted.com/talks/ellen_t_hoen_pool_medical_patents_save_lives.html

allocated to health issues than ever before, and for more progress to be made in health standards. The mortality rate among children under 5 years old was reduced by half in 20 years. But much more effort needs to be made to improve global health for everyone, without "leaving anyone behind".

In that regard, the new global health framework integrated in the 2030 Agenda for Sustainable Development (2016-2030)²³ is substantially broader than the MDGs. Its SDGs are meant for application to all countries and not just to developing ones. Although they are still poverty focused, they are now more focused on equity, which is why they are articulated into 3 dimensions (economic, social and environmental development), all of which are built around the so-called "5Ps": people, planet, prosperity, peace and partnership.

Among the 17 SDGs on the international agenda, there is a specific goal that is directly related to health issues, SDG3. SDG3 aims to "ensure healthy lives and promote well-being for all at all ages". And within SDG3 nine targets should be addressed. These cover aspects that were already present in the MDGs, such as the reduction of the global maternal and child mortality ratios and an end to epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases. They also address other specific global health problems: substance abuse, road traffic accidents, and sexual and reproductive healthcare. Moreover, considerable attention is paid to the improvement of worldwide health coverage, with one of the most ambitious SDG3 targets seeking to achieve Universal Health Coverage (UHC) by 2030.

As defined by Melitta Jakab from the World Health Organization (WHO), UHC means that "all people should have access to needed health services, of sufficient quality to be effective, without experiencing financial hardship". The implementation of UHC therefore requires:²⁴

- ◆ Government commitment to health as an entitlement for all,
- ◆ Sufficient financing to pay for essential care,
- ◆ Fair financing with risk protection,
- ◆ Evidence-based prioritisation of healthcare related to available budgets,
- ◆ Sufficient trained, distributed, motivated and supported health workforce,

²³ <https://sustainabledevelopment.un.org/>

²⁴ Points from Rafael Vilasanjuan's presentation during the SDG3 round table at the GUNI conference.

- ♦ Access to essential medicines and technologies.

From a health financing perspective, the cornerstones of policy towards UHC are:²⁵

- ♦ Commitment translated into compulsory public funding,
- ♦ Pooling of public funds without fragmentation that enables more equalization,
- ♦ Strategic purchasing to align funding with services, because it is key to translate benefits and entitlements to tangible services for people.

So the key policy directions for implementing UHC are well known. The problem is more practical: it is extremely complex to implement those directions technically, institutionally and politically.

But SDG3 is not the only goal related to health on the 2030 Agenda. There are at least ten other SDGs if we consider their related indicators: no poverty (SDG1), zero hunger (SDG2), gender equality (SDG5), clean water and sanitation (SDG6), affordable and clean energy (SDG7), decent work and economic growth (SDG8), sustainable cities and communities (SDG11), climate action (SDG13), peace, justice and strong contribution (SDG16) and partnerships for the goals (SDG17). The importance of improving health and well-being is clearly stated on the current international agenda.

In this context and for the next 13 years until 2030, the UN member states have agreed to intensify their efforts to accomplish the SDGs. But governments cannot fulfil them alone. They will need the involvement and cooperation of all agents in our societies. In particular, academia should also get involved in the 2030 Agenda. Universities and research centres can play an important role by developing and transferring knowledge, methodologies and tools addressing the SDG targets.

Research and innovation can for sure be a key enabler of health-related SDG but efforts should be made to improve the social impact arising from academic practices. Awareness among researchers of the global goals should be raised, while research assessment and the related incentives, rewards and promotions should be conveniently revised. Many voices in the academic community are complaining that research is too focused on scientific publications rather than social impact. And within the

²⁵ Points from Melitta Jakab's presentation during the SDG3 round table at the GUNI conference.

biomedical field, research is clearly under scrutiny²⁶. The reorientation of science into social impact would help to make it more transformative, and also raise its legitimacy and accountability.

Moreover, according to experts, one of the specific tasks where academia could be of major value is in monitoring and reporting the progress of "what matters and in accessible and understandable ways". As "leaving no one behind" is the basis of the SDGs, it is essential to measure where advances have been achieved and where challenges or new threats are occurring. Of the SDGs, 50 health-related indicators are directly involved with health services, health outcomes and risk factors. In order to evaluate their evolution, a study was published in September 2017 in which a set of 37 of the 50 health-related indicators were used to calculate a health related SDG index²⁷. The illustration below shows the health SDG index by country in 2016. The study was performed in 188 countries, and clearly shows the huge differences between them. The lowest health-related SDG indexes were those of Afghanistan, the Central African Republic and Somalia while the highest were in Singapore, Iceland and Sweden.

The main conclusion of the roundtable was that, in terms of health and well-being, there are still clear areas where much more effort and attention are required from all of us. But it is worth remembering at this point that the 2030 Agenda for Sustainable Development is an integral and transversal action plan. The SDGs are interconnected and mutually influence each other. In that regard, it is hard to imagine improvements to SDG3 without any changes to SDG1 or SDG2. We should keep working hard, together and with the integral approach of the Agenda if we want to achieve the indicators agreed for 2030.

NB: This text was produced after the roundtable on SDG3 at the GUNI conference and thanks to contributions by Rafael Vilasanjuan (Director of Policy and Global Development Barcelona Institute for Global Health - ISGlobal), Melitta Jakab (Senior Health Economist at the WHO Barcelona Office for Health Systems), and Paula Adam (Head of Research at the Agency for Health Quality and Assessment of Catalonia - AQuAS).

²⁶ "Biomedical research: increasing value, reducing waste" Macléod MR *et al*, *The Lancet* 383 (2014) 101-104.

²⁷ "Measuring progress and projecting attainment on the basis of past trends of the health-related Sustainable Development Goals in 188 countries: an analysis from the Global Burden of Disease Study 2016" GBD 2016 SDG Collaborators, *The Lancet* 390 (2017) 1423-1459

Designing the Future: Sustainable Development Goals (SDGs) and the Humanities

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Foreword

It is said that the world is changing. Actually the world has always been changing, as both general life and human life are based on dynamic biological processes that lead to constant fluctuation and mutable states. And human life also relies on dynamic cultural processes. Lack of dynamism brings extinction. Non-dynamic biological species cannot adapt to inevitable environmental changes, and are condemned to extinction. In parallel, non-dynamic cultures are unable to adapt to social changes, and thus are also condemned to extinction. So the world is changing, but the world must also continue to change. The main difference from past human history (and prehistory) is that the world is changing much faster. And for the first time, changes are global. So the issues that humankind is facing have to be thought globally, despite having to be applied locally –and in keeping with local cultures and specific needs and capabilities.

It could be said that present-day global civilization stands on two legs: one is humanities, and the other is science. Beyond the convenience of considering science and humanities as two different human constructs, as both are generated by human intellects as ways to understand and manage life and social issues, as well as improve human well-being, what is certain is that different cultures give different meanings and values to both humanities and science. To help improve the lives of people everywhere, the United Nations established the «2030 Agenda for Sustainable Development», including the so-called Sustainable Developmental Goals (SDGs), to be accomplished by 2030. However, despite present-day global civilization standing on both humanities and science, most of these

goals and their subsequent targets are approached from scientific premises, neglecting the immense weight of humanities in human life and fluctuating societies. In this paper, I will discuss some of the roles humanities may have, or rather must have, in order to fully develop the SDGs established by the United Nations in 2015. First, I will introduce the general context by which SDGs were established, to shed some light on why they are based mainly on scientific premises. Then, I will move on to discuss why humanities are clearly needed in close collaboration with science. Finally, I shall debate what humanities can do to contribute to the achievement of the 2015 SDGs Agenda. The conclusions draw on the issues discussed in Session 3 –SDGs and the Humanities– of the *International Conference on Sustainable Development Goals: Actors and Implementation*, held in Barcelona, 18-19th September 2017.

A General Context for the SDGs Agenda: Why it is Mainly Based on Scientific Premises

In 2015, 193 world leaders met at the United Nations (UN) headquarters in New York and formally adopted an ambitious agenda for sustainable development, the Sustainable Development Goals (SDGs). The meeting was agreed three years before, at the Sustainable Development Conference held in Rio de Janeiro in 2012 (also known as Rio+20), after evaluating the accomplishment of the former Millennium Development Goals (MDGs). The MDGs were established in 2000 to be targeted on 2015, and they included 21 specific targets grouped into eight main goals. The SDGs established in 2015, which are part of the so-called «2030 Agenda for Sustainable Development», are far more ambitious, and include 169 specific targets grouped into 17 goals, including economic, social, productive, educational, healthcare, equality, safety and ecological issues.

Set as universal, inclusive and indivisible, this Sustainable Development Agenda calls for action by all countries to improve the lives of people everywhere. Thus, governments, businesses and civil society, together with the UN, have started to mobilize efforts to achieve the Agenda by 2030. Interestingly, most of these goals, if not all of them, have been designed to rely mainly on scientific and technical premises, rather than humanistic ones. In this regard, the involvement of scientists and technologists in the sustainable development goals may be traced back to 1992, i.e. eight years before the Millennium Development Goals were established in 2000. A group of scientists self-named the Union of Concerned Scientists, working under the motto of «Science for a Healthy Planet and Safer

World», produced a scientific statement entitled «World Scientists' Warning to Humanity» that begins: "Human beings and the natural world are on a collision course." A majority of the Nobel Prize laureates in the sciences signed the document, and about 1,700 of the world's leading scientists appended their signature. Initially published as a chapter in the book: *A Distant Light. Scientists and Public Policy*, by Henry W. Kendall (Springer), it has been reproduced elsewhere and is easily found (<http://www.ucsus.org/about/1992-world-scientists.html>).

The 1992 World Scientists' Warning to Humanity focused on five main points, namely: to bring environmentally damaging activities under control to restore and protect the integrity of the earth's systems we depend on; to manage resources crucial to human welfare more effectively; to stabilize population; to reduce and eventually eliminate poverty; and to ensure sexual equality, and guarantee women control over their own reproductive decisions. These goals are very close to, and probably inspired, the first discussions to establish the 2000 MDGs and, later, the 2015 SDGs. In other words, the SDGs were born primarily and largely under scientific premises, which justify their bias towards science and technology. Moreover, an updated version of the World Scientists' Warning to Humanity, entitled «**World Scientists' Warning to Humanity: A Second Notice**» (*BioScience*, Oxford University Press, doi.org/10.1093/biosci/bix125) is to be published shortly, to which more than 13,000 of the world's leading scientists have appended their signature (including the author of this paper). This paper expands upon and updates the 1992 one, and runs in parallel to the 2015 SDGs established by the UN. Additionally, after the so-called global financial crisis –which not only affected the economy but also sensitivity to human rights–, technology and science have taken a predominant role, leaving humanities somewhat in the background, according to the perception of different stakeholders.

Why Humanities are Clearly Needed - in Close Collaboration with Science

Both scientific and humanistic knowledge and progress share –or *must* share– the same main goal, which is, to my understanding, to contribute to human well-being and dignity. This statement, which is clearly ideological, inspires or is a direct consequence of the 17 goals established by the 2015 SDGs to transform our world in a desirable and conscientious manner. However, science and humanities are often viewed as being poles apart. Sometimes they are conceived as an antagonistic collision of

objectivity and subjectivity, reasoning and emotion, understanding and intuition.

Conversely to these somehow widespread misconceptions, both science and humanities are integral to human beings. From the perspective of both biological and cultural evolution, science and humanities are equally needed to contribute to humanity's progress and survival. Thus, considering that the main goal of human knowledge, including science and humanities, is to contribute to human well-being and dignity, it would be easy to say that science needs humanities since it requires reflection, social and historical contexts, cultural contributions, etc., to develop and progress in the best social direction. Without humanistic contributions, science is something of a dead end street.

Likewise, humanities cannot marginalize science from the progress of human dignity, as we have developed a highly technified world based on scientific advances, and we live and survive within it. Science is also making crucial contributions to some traditionally considered humanistic issues, for example those derived from cognitive neuroscience studies, which help to understand mental –or cerebral– aspects such as decision making, emotions and morality, among many others. These aspects are also crucial to implementing the SDGs and their specific targets.

Thus, a humanistic approach running in parallel to the scientific one for the 2015 SDGs is clearly needed. The contribution of humanities as well as its research into the resolution of social issues cannot be denied, and these are key components of the equation because the challenges humankind has to face have important social components.

What Humanities can Do to Contribute to the Achievement of the 2015 SDGs Agenda

To help to fill this important gap, Session 3 of the *International Conference on Sustainable Development Goals: Actors and Implementation*, which was held in Barcelona on 18-19th September 2017, was devoted to «SDGs and the Humanities». The main goal of the session was to critically reflect on the role of humanities in our society so that research areas may be reoriented and aligned to the needs of society and the challenges posed by the SDGs. The invited speakers were Marina Garcés, Professor of Philosophy at the University of Zaragoza; Ellen Hazelkorn, Policy Advisor at the Higher Education Authority and Director of the Higher Education Policy Research Unit at the Dublin Institute of Technology; and Manuel Montob-

bio, Diplomat, Writer and Doctor in Political Science. The moderator of the session was the author of this paper. The main question that speakers were asked to deal with during the session was what humanities can do to contribute to the achievement of the 2015 SDGs Agenda?

The main points that were discussed by the speakers and attendants were issues that humanities have to face. First, humanities are still mostly conceived in the 19th century framework and in a Western conception, but the context we are living in today is not the same as before and it is changing very fast. So humanities not only have to adapt to 21st century needs but also to a highly dynamic process of change, mainly driven by scientific, technological, economic and social issues. In this regard, the 21st century social framework is characterized by being economically but also culturally globalized, so humanities have to be redefined to fit new needs. It was proposed that humanities should be redefined as all those activities that are engaged in the elaboration of the form and the sense of human experience, from the point of view of dignity and freedom, to emancipate us from the fatalism of our own distraction (liveable life) and the determinism of what should be. It was also proposed that sustainability should be defined from the humanistic point of view as the dynamic relationship between life and knowledge, from the perspective of a liveable and common world.

Second, when we speak about humanities, we tend to commit the mistake of having an ethnocentric vision that makes us biased and limited in our analysis of the situation. This aspect is important enough if we consider that in order to achieve the 2030 Agenda we need global solutions, and not ethnocentric or ideologically biased solutions. So we clearly need to gather views from all around the world to enrich the path towards sustainable development. For example, instead of taking for granted that humanities are based on Plato –to name a classical philosopher– and thus Western notions, why do not think like Confucius –and thus in terms of certain Eastern notions–? The governance of the SDGs needs to be more global than ever so that we can build together, from the best of each culture, a fairer and more sustainable future. It also needs to be more global to engage all humanity, and to generate a framework where most, if not all, people can feel them like their own. In this regard, the differentiating point of the 2030 Agenda is that for the first time we are all involved in it, not only developed countries.

Third, public perception and understanding of the value of arts and humanities have to be expended in two different but convergent directions: for their practical value

beyond ourselves, for example for organisation and management procedures, as well as for research to increase the background in humanities in accordance with the 21st century world. In this regard, the main actors involved in humanities research (universities, researchers and governments) have to make an effort to show and disseminate the importance of the contribution of humanities to the progress of humankind, including social, economic and also scientific and technological areas. Moreover, they must also show and disseminate current trends in humanities by themselves, in an affordable way for the public.

Fourth, the metanarrative of humanities is made of archetypes, lenses through which we see the pre-conceived reality. Thus, in keeping with the previous points, the actors involved in humanities must deconstruct these paradigms to shift from the traditional linear model of progress and innovation to a user-inspired or user-oriented open innovation, including public universities. The SDGs must be perceived as a social contract, a new paradigm that includes us all, whereby humanities can help to internalize externalities, as the development and implementation of the SDGs needs a mental transition from the “us” (passive subjects) to the “we” (active subjects).

In summary, one of the contributions that humanities can make to the SDGs is probably to redefine the limits of human nature in an increasingly technological and economically, politically, socially and culturally globalized world, as well as in the so-called 4th industrial revolution –a civilization project that touches directly on what it means to be a human today–, bearing in mind the central idea of human well-being, dignity and freedom.

Implementing the 2030 Agenda in Catalonia: Challenges and Opportunities

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The United Nations Sustainable Development Summit (New York, 25-27 September 2015) formally adopted the 2030 Agenda for Sustainable Development²⁸, which contains 17 Sustainable Development Goals (hereinafter, SDGs) and 169 specific targets.

These SDGs and targets (i) are integrated and indivisible, (ii) are global in nature and universally applicable, (iii) take into account different national realities, capacities and levels of development, and (iv) respect national policies and priorities. These four principles or criteria will be of crucial importance when they are transposed and implemented into these specific and diverse realities.

The SDGs tackle five areas of critical importance (the so-called 5 Ps): planet, prosperity, people, peace, and partnership, covering areas such as poverty, inequality, food safety, health, sustainable consumption and production, growth, jobs, infrastructures, the sustainable management of natural resources, the oceans and climate change, as well as gender equality, peace, social inclusion, access to justice and responsible institutions. These are crucial issues at the international level but also at the national and local levels.

In the “Transforming the World” resolution, approved in New York in September 2015, all UN member states are requested “to develop as soon as practicable ambitious national responses to the overall implementation of this Agenda”. It specifically refers to existing planning instru-

28 <https://sustainabledevelopment.un.org/post2015/transformingourworld>

ments, such as national development and sustainable development strategies as the foundation on which to build the process of implementing these global goals and targets.

Thus, governments (together with stakeholders) need to design implementation processes that take into account their specific and diverse national realities, capacities and levels of development. These are processes that -according to the declaration- “respect national policy space (...) while remaining consistent with relevant international rules and commitments”.

Although the approval of 17 global goals and their 169 associated targets is undoubtedly good news, we face a major challenge: their implementation. In that regard, the ambition of the new agenda and the transformational capacity it pursues should contribute to the much-needed transition to a more sustainable planet (bearing in mind the long path ahead and the urgent need to resolve some of the major problems that affect and threaten its future, at least as we know it).

All parties involved in the achievement of the SDGs -both globally and on lower scales- are aware of this challenge. However, this should not diminish the efforts they take to transform their realities in a more sustainable way by localizing the goals and associated targets.

Localising SDGs in Catalonia

As part of its global responsibility, the Government of Catalonia contributed to the definition of the SDGs and targets prior to the approval of the 2030 Agenda. In this regard, its Ministry of Territory and Sustainability followed up the Open Working Group (OWG) discussions to carry on the definition of the SDG proposal through the Network of Regions for Sustainable Development (nrg4SD) and in the capacity of this network as a member of the Local Authorities Major Groups. As the nrg4sd reports on its website, this network made an additional contribution to the process through two international initiatives: Communitas Coalition for Sustainable Cities and Regions in the New UN Development Agenda²⁹, and the Global Task Force of Local & Regional Governments for the Post-2015 Development Agenda Towards Habitat III³⁰.

In 2016, the Government of Catalonia pledged to develop a National Plan for the implementation of

29 <http://communitascoalition.org/>

30 <http://www.gtf2016.org/>

the 2030 Agenda³¹ and to produce an integrated system of targets and indicators to assess the degree of compliance of the SDGs. This strong and direct commitment was included in the Government Plan, which constitutes the Executive road map for the current political term. A first draft of the 2030 Agenda Implementation Plan was delivered to the Government on 7 July 2017 and the main outlines of the plan were presented in some side and parallel events to the UN High Level Political Forum on Sustainable Development (New York, July 2017).

The 2030 Agenda Implementation Plan involves the entire Catalan Government and is coordinated by the Ministry of Transparency, and Foreign and Institutional Relations and Affairs through the Advisory Council for the Sustainable Development (CADS), the Directorate-General for Multilateral and European Affairs and the Directorate-General for Development Cooperation, with the support of its Technical Office.

The process adopted to localise the SDGs in Catalonia has the following milestones:

- 4) advising the Government of Catalonia on the design and implementation of measures to raise awareness of sustainability,
- 5) encouraging the involvement of economic and social sectors in the development process in Catalonia.

In September 2016 the council launched the 'The 2030 Agenda: Transform Catalonia, Improve the World' report³², which identifies key elements for localising the SDGs in Catalonia. The 16 members of the council, with the contribution of more than 60 external experts and stakeholders, produced the report. It was approved at a plenary session held on 27 September 2016, the first anniversary of the approval of the 2030 Agenda by the United Nations General Assembly.

The report gives key elements for localising the SDGs in Catalonia: it includes a preliminary International and European diagnosis for every SDG, contains a target-by-target diagnosis referred to Catalonia, and identifies the overall challenges that Catalonia faces for every SDG. The CADS report was the knowledge input for the aforementioned National Plan for Catalonia.

A Diagnosis of the SDG Challenges Serving as a Basis for the Production of the Plan

In November 2015, the Government of Catalonia requested a comprehensive report to the Advisory Council for Sustainable Development of Catalonia (CADS) on the implementation of the 2030 Agenda in Catalonia. This council was created in 1998 and its mandate includes:

- 1) advising the Government of Catalonia on issues affecting sustainable development, especially on incorporating the principles of sustainability in policy, regional and sectorial planning instruments, draft legislation and regulations, and in the strategic projects and initiatives led by the Government,
- 2) assessing the strategic policies for sustainable development put forward by the Government of Catalonia, especially those related to energy, water, food security, climate change and the green economy, and to formulate proposals for these areas,
- 3) encouraging the transfer of knowledge between the Government, the academic world and civil society in the field of sustainable development,

Inter-ministerial Coordination Mechanisms

On 14 February 2017, the Catalan Government created an Inter-ministerial Commission responsible for the production of the National Plan for the Implementation of the 2030 Agenda. It also received the mandate to ensure consistency and monitor compliance with the SDGs.

According to the decree creating this Inter-ministerial Commission, it is composed of high-level political representatives of all 13 ministries and is attached to the Ministry of Foreign Affairs, Institutional Relations and Transparency. It is assisted by a Technical Committee, which is a task force composed of specialist representatives of all ministries in the Catalan Government.

This technical committee has been structured into 17 working groups, each of which has been coordinated by the ministry that holds the most competences related to the SDG. For instance, the working group on SDG 1 (*End poverty in all its forms everywhere*) is coordinated by the Ministry of Labour, Social Affairs and Families and includes representatives of the following ministries: Presidency; Vice-presidency, Economy and Finance; Foreign Affairs,

31 More information at: http://cads.gencat.cat/web/.content/Documents/Agenda_2030/The-2030-Agenda-transform-Catalonia-improve-the-World.pdf

32 http://cads.gencat.cat/web/.content/Documents/Informes/2016/Agenda_2030_CAT/CADS-Report_3_2016_The-2030-Agenda_Transform-Catalonia_Improve-the-World.pdf

Institutional Relations and Transparency; Education; Governance, Public Administrations and Housing; Territory and Sustainability; Health; and Business and Knowledge.

Due to the crosscutting nature of the challenges to be addressed, no ministry has a leading role: the ones that coordinate the group create a successful dynamic to bring everyone to the discussion in the same position. This methodology helped to promote synergic work among the different ministries, breaking existing silos, and creating a comprehensive vision of challenges and solutions.

Although all SDGs are interlinked, the existence of 17 individual goals does not help to overcome the traditional fragmentation of public policies. The Plan seeks to solve this situation by working with a strong collaborative approach, and also by reviewing the different commitments from the gender, urban, intergenerational, and cultural perspective.

Apart from the production of the National Plan for the Implementation of the 2030 Agenda, the Catalan Government is working on the New Urban Agenda of Catalonia, aiming to localise the Global Urban Agenda approved at the Habitat III Conference (Quito, 2016). Both agendas are connected in terms of contents and schedules to ensure real and strong policy coherence.

A Highly Pragmatic and Focused Approach

Since September 2015, the localisation of the SDGs has been a priority for several national, subnational and local governments. The process is not easy, and “learning by doing” seems to be a common rule worldwide. Due to the transformative nature of the 2030 Agenda and the ‘urgent urgency’ of the challenges we face in terms of unsustainability, a highly practical approach is required. A major challenge is the integration of the SDGs in the context of public policy and planning.

In the plan being designed in Catalonia, this practical approach consists of concretizing the UN 2030 Agenda targets in clear (and tangible) commitments. The use of ‘commitments’ instead of ‘targets’ expresses the need to implement clear and concrete intentions.

On a first layer, for every individual target the plan separately identifies those commitments to be developed in Catalonia and those representing a direct contribution from Catalonia to the global community or third countries. On a second layer, the plan divides those commitments aligned to existing regulation and planning from

those included in regulation and planning under preparation or under review.

To identify these commitments, an exhaustive review was conducted of the actions currently being undertaken and of how their implementation allows us to achieve (or not to achieve) the global goals and targets. Most of the global targets are of a qualitative nature and it is therefore necessary to fix quantitative references in Catalonia.

Although the Plan is now under review, in September 2017 it contained more than 750 commitments both on a Catalan and international scale. Furthermore, it sets deadlines and specifies the ministries in charge of each commitment included in the plan. Finally, it contains a battery of indicators, which will be discussed by an *ad-hoc* inter-ministerial taskforce to be created in early 2018.

Dissemination of the 2030 Agenda in Catalonia

From May to June 2017 the Catalan Government organized six seminars to discuss the challenges that Catalonia is facing and its commitments in relation to the implementation of the 2030 Agenda. Each seminar was focused on one of the six SDGs to be analysed at the UN High Level Political Forum (New York, July 2017).

Opened by ministers and high-level government representatives, each seminar included keynote speeches by internationally recognized experts followed by a roundtable with stakeholders.

Besides contributing to the dissemination of the 2030 Agenda among Catalan society, these seminars were a first step towards the participatory process open to all relevant actors in Catalonia, in order to get the maximum consensus regarding the commitments included in the plan. This participation phase will be organised in mid-2018.

Metropolitan Areas: Key Actors in the Implementation of the 2030 Agenda and the Sustainable Development Goals (SDGs). The Example of the Barcelona Metropolitan Area (AMB)

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Director of International Affairs and Cooperation at the Barcelona Metropolitan Area

Introduction

Within the framework of the Conference held by Global University Network Innovation (GUNI), I had the opportunity to participate in the session on "Local Governments, Urban Cities", which dealt with the importance of local governments in the challenge of achieving SDG's. The session was also attended by Mohsen Abounaga and Dan Lewis, and gave us the chance to discuss the challenges faced by cities and metropolitan areas, which are the real cores for the creation of wealth, employment and welfare. Cities currently produce 80% of the world's GDP on just 2% of its land. Abounaga focused his presentation on some of the most important challenges that know no borders, such as climate change, and that need to be addressed by cities. For Lewis, the transformation of cities should allow us to reduce the effects of natural disasters. The New Urban Agenda and the 2030 Agenda are excellent guides for the construction of the present and future metropolises, but it will only be possible to build a better world with the unavoidable involvement of cities and metropolitan areas.

The Example of the Barcelona Metropolitan Area (AMB)

Less than a century ago, the borders of the city of Barcelona were clearly defined. It was a city with clear boundaries that outlined and separated the city from the outside. However, as a result of immigration and increasing urbanisation, a little over five decades ago there was a need to manage the territory beyond the lines drawn on the map showing where Barcelona began and ended. The boundaries with the neighbouring cities of Sant Adrià, L'Hospitalet, Badalona and Santa Coloma de Gramenet were no longer so clear and necessitated a continuity and unification of management that the strictly municipal areas no longer provided.

This need pushed the public authorities to create the first metropolitan entities, which were primarily associated with land-use planning and urban planning. Years later, other basic services were added, such as water, waste management and mobility.

Back then, the 'metropolitan solution' offered more effective responses to citizens than strictly local solutions or those coming from larger, such as nationwide, spheres. Even today, when the challenges that require attention are global or international, such as climate change, the refugee crisis, etc., metropolitan spheres, where people, resources and economic activity are concentrated, are the best levels to act through policies that have both local and global repercussions.

The metropolitan area is viewed today as a 'city of cities' or as the government of the 'real city'. Metropolitan areas are the outcome of an urbanisation process that has consolidated urban areas with the most public services, a better sewage network, more efficient waste management and mobility that is more effective, more environmentally sustainable and better planned.

The importance of cities and metropolitan areas in achieving the United Nations goals is indisputable. The Sustainable Development Goals can be achieved from a sphere that will almost always be metropolitan. This is why it is so important to be able to adapt to the political and institutional realities of the region to achieve the goal of attaining a more effective response to people's needs.

In order to create instruments and governments that are more effective at achieving the SDGs, we must imagine and plan a world with a different political system that has the capacity to change the balance of power, sovereign-

ty and the empowerment of local governments. Only by adapting the current systems of governance and the distribution of resources can we enable metropolitan areas to develop their potential under optimal conditions.

The United Nations Habitat III Conference held in Quito in October 2016 offered a unique opportunity to discuss the important challenge of managing and governing cities and villages. This is tantamount to a universal transformation of our metropolises. The new metropolises are generated by a major urbanisation process whereby new metropolises must be equipped with the instruments they need to cover the basic services of all of the people who are moving to them.

Most of the 17 United Nations Sustainable Development Goals directly affect municipal or local action. Putting an end to poverty, ensuring sustainable water management for everyone, promoting inclusive societies or combatting climate change are goals that can only be tackled seriously if done with the complicity and alliance of regional agents, companies, unions, universities, research and innovation centres and especially local governments and administrations. However, if there is one SDG that stands above all the others in relation to urban transformation, it is number 11, which establishes the need to 'make cities and urban settlements that are safe, resilient and sustainable'.

Including cities in the United Nations Conference in both developing and stating the importance of local administrations today is a clear victory, but it is obvious that the remaining goals also affect the local sphere and its governance either directly or indirectly, and so the SDGs must be approached from the cross-cutting vision that is needed to attain them.

One of these examples of a local government that is concerned with and committed to the SDGs is the Barcelona Metropolitan Area (AMB). This is the public administration of the metropolitan area of Barcelona, a conurbation that occupies 636 square kilometres and is made up of 36 municipalities with a little over 3.2 million inhabitants. The urbanised zone of the Barcelona Metropolitan Area accounts for 48% of the total land, while the remaining 52% is forests, natural parks and farmland.

The AMB was established thanks to the law that was unanimously approved by the Parliament of Catalonia in 2010, whereby the 3 municipal entities that had existed until then - the Association of Municipalities of the Metropolitan Area, the Environment Entity and the Metropolitan Transport Entity - were merged into a single public entity.

The new public administration was recognised as a public entity spanning the entire metropolitan area, the only one of its kind in Spain.

Today the AMB is the third largest public authority in Catalonia in terms of public budget, which totals €637 million, or €1.4 billion if we include all the publicly-owned enterprises that the AMB owns. The AMB plays an eminently technical role in which it represents the management of large infrastructures and public services, which supply more than 3.2 million inhabitants and are classified into 4 groups: (a) territory, (b) environment, (c) mobility and (d) economic and social development.

a) Territory: The AMB is responsible for the integrated regional planning of the metropolitan territory. This means that the metropolitan administration has the authority to 'draw' the metropolitan land uses (including residential, industrial, green, etc.). In addition to urban planning, the AMB also holds authorities over (1) the infrastructures of metropolitan interests related to transport, energy, waste, the water cycle and telecommunications; (2) the public space, such as parks, beaches and rivers; and (3) housing, through the Metropolitan Institute for Land Development and Asset Management (IMPSOL).

b) Environment: The environmental and sustainability competences are associated with 3 areas:

- ◆ 1. the water cycle: Water is a scarce resource that is essential for life and for the harmonious, sustainable development of economic activities. For this reason, the AMB's water policies are based on a management model grounded upon moderation, efficiency, savings and reuse. Today, water consumption per inhabitant is 103.5 litres a day.
- ◆ 2. waste management: In 2015, each inhabitant of the Barcelona Metropolitan Area generated 434.35 kilograms of household waste, a figure that entails steady savings since 2008, when the amount was slightly higher than 500 kilograms with a higher population.
- ◆ 3. the environment: The management of green areas, the reduction of CO2 emissions and the recovery of the riverbeds of the Llobregat and Besós Rivers are just some of the functions that law 31/2010 assigned to the AMB.

c) **Mobility:** In terms of transport and mobility in general, the AMB holds authority over public passenger transport in the area spanning the 36 municipal councils. The service managed by the AMB covers almost 70% of the metropolitan mobility that takes place in collective transport. The AMB has 210 bus lines, 34 underground lines and 10,523 taxi licenses, in addition to the 343 kilometres of bicycle lanes. In terms of mobility, 75% of daily commutes take place via sustainable means. Currently there are 565 private vehicles per 1,000 inhabitants.

d) **Economic and social development:** The challenge of creating jobs and inclusive economic growth has become a compulsory goal. The AMB promotes economic activity, employment and entrepreneurship in areas like industry, retail and services. But it also implements social policies to combat and attenuate the social inequalities caused by the economic system. Social cohesion is one of the main objectives that define the aid policies of the metropolitan council to combat social vulnerability and exclusion. There are three strands in this area: the fight against energy poverty, social pricing and employment plans.

The new global agenda that has emerged from the United Nations Conference in Quito can be viewed as an international summit that is more laden with good intentions but with shortcomings in its real ability to execute the goals. We might say that the commitment to environmental issues reflected in Habitat III, involving perennially insufficient commitment by the states, will remain mere lip service because of the lack of real transformation and change in governments, which seek economic growth at any price.

However, it is realistic to send a message of optimism regarding the global transformation entailed in achieving the Sustainable Development Goals. The Millennium Goals proposed a reduction in poverty from 36% to 18%. At that time, in 2000, that was also seen as a utopian dream stemming from the governments' need to appear before the world as actors that were minimally sensitive to a question that seriously affected more than one third of the world's population. Yet by 2015, the percentage of poverty in the world had dropped to 12%.

The new urban agenda does not just speak about poverty. It also exhorts us all to make a personal, irrevocable commitment to making a better future possible for the forthcoming generations. And to do so, we urgently need

to change our production and consumption model. A shift from the general ideas that seem to be upheld by the Sustainable Development Goals to transformative local action may seem a difficult task. And it is. But if we bear in mind successes until now, the technological capacity we have reached, production in the field of agriculture, and the advances in science and healthcare, we can see that if public governments and the people set out to do so, we have enough resources and knowledge to achieve the SDGs.

Local governments are extremely important in attaining these global goals. Nation-states and international organisations are not the only global actors; local governments are also crucial to ensuring that cities work in a sustainable way without the current exploitation of resources.

The goal is no longer for governments to endorse a statement of good intentions; rather it is a need, an urgency, an outcry for these statements to become deeds. The future of the planet and therefore the future of our cities will not be feasible if we are unable to live with respect for the environment and an economy that does not endlessly exploit the resources we have.

The SDGs set goals that should be reached by 2030, but we may not have that much time. The urgency of the SDGs is essential in order to ensure the sustainability of a future that increasingly requires individual commitment, a change in habits and a transformative mentality.

About the authors

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Alejandra Agudo Lazareno is a journalist. She holds a Bachelor's Degree in Journalism from the Universidad Complutense de Madrid and a Master's Degree in Journalism from the Universidad Autónoma de Madrid and El País. She is currently a writer at Planeta Futuro for the section on Sustainable Development of El País, which she joined on its launch in January 2014. She previously worked in the society section of the same newspaper, for NGOs, and corporate and local magazines in Madrid. As a student, she has also spoken on the microphones of Radio Nacional and Cadena Ser during different summers.

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Alícia Betts has been Head of Projects at the Catalan Association for Public Universities (ACUP) since 2009 and at the Global University Network for Innovation (GUNI) since 2014. Her work at ACUP focuses on joint internationalisation strategy development and implementation, university governance, funding and management policies, benchmarking studies and organisation of events. She has been actively involved in the "Internationalisation Plan of Catalan Public Universities 2010-2015" (2010), the OECD Reviews of Higher Education in Regional Development (Catalonia region), the European Drivers for a Regional Innovation Platform project (funded by the LLP) and the Platform for Knowledge, Territory and Innovation initiative. She has also collaborated with the Centre for Higher Education Policy Studies (CHEPS) on several of its research projects regarding the Catalan and Spanish higher education system. She studied Audiovisual Communication and International Relations at the Universitat Autònoma de Barcelona (UAB) and is a graduate of the European Master in Higher Education (Erasmus Mundus - HEEM, University of Oslo, University of Tampere, University of Aveiro).

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Ricard Giné's training and professional experience has covered water resource management, water and wastewater treatment, rural water supply and sanitation as well as environmental engineering. He has more than 15 years of professional experience on a variety of projects in Spain, East Africa and Central and South America. In the field of water and sanitation services delivery, he has combined formal educational programs (M.Sc. at Imperial College London, 2007; and Ph.D. in Civil Engineering at the UPC, 2015) and professional practice, participating in more than 20 different projects in East Africa (Mozambique, Tanzania, Kenya and Ethiopia) and South America (Nicaragua, Bolivia, Peru and Brazil). Research topics addressed range from improving the availability of reliable information, to improving access to information, and encouraging the use of this information in decision-making processes. Specifically, his research interests focus on the connections between the improved delivery of water, sanitation and hygiene services and human development - especially the links between science, policy and practice in low-income countries.

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Victoria Gómez has been Project Officer at the Catalan Association of Public Universities (ACUP) and the Global University Network for Innovation (GUNi) since 2017. At ACUP, she focuses on internationalisation and the social responsibility of universities. At GUNi, she is currently involved in the GUNi SDGs project, as well as participating actively in the 7th edition of the Higher Education in the World Report. During her professional career, Victoria has worked for different (non-profit) organizations, always with an international perspective. Before working at ACUP-GUNi, Victoria gained experience at PIMEC (the Catalan SME employers' association), and at the Embassy of Spain in Egypt. She has volunteered for openDemocracy as an editor and translator as well as for IAFOR as a Conference organiser. Victoria holds a Bachelor's Degree in English Studies from the University of Barcelona (UB), as well as a Master's in International Relations (IBEI-UPF-UB-UAB). She participated in the graduate exchange programme in Global Affairs at the American University in Cairo (AUC).

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Ali Hossaini works at the forefront of organisational, technological and aesthetic change. Active in strategic planning worldwide, his interests span the arts, telecommunications, AI and theoretical biology. His work has won acclaim from Vanity Fair, Cool Hunting and others, including the New York Times, which describes him as "a biochemist turned philosopher turned television producer turned visual poet." Hossaini is Visiting Research Fellow in the Department of Informatics, King's College London, a trustee of Young Vic theatre, and Associate of FutureCity and Lord Cultural Resources.

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Oriol Illa holds a degree in Political Science and Administration from the Autonomous University of Barcelona (UAB) and a Master's Degree in Financial Management from Pompeu Fabra University (UPF) and a Diploma in Management from the School of Public Administration of Catalonia. He is the author of the books *Idees perilloses* (Ed. Els Llums, 2014), *Entre el símbol i la institució* (Ed. Angle, 2010) and *Cròniques d'indignació* (Ed. Clavell, 2012), and co-author of *Som laics? 17 mirades sobre la laïcitat* (Ed. Els Llums, 2013) and *Objecció: la revolta pacifista* (Ed. Neopatria, 1998). He has had professional responsibilities in the field of public management. Between 2006 and 2010 he was the head of the office of the Vice President of the Government of Catalonia and from 2003 until 2006 he was deputy mayor of Barcelona City Council. He is currently the director of the international area of the Metropolitan Area of Barcelona. In the field of social action, he has been Director General of the Francesc Ferrer and Guàrdia Foundation (from 2011 until July 2015), a member of the editorial board of the magazine *Espai de Llibertat* (2005-2015) and member of the governing council of the cooperative ENCÍS3 (2013-2016). He was co-founder of the UGT of Catalonia youth organization, AVALOT, on behalf of which he chaired the National Council of Youth of Catalonia (CNJC) between 2001 and 2003. On July 16, 2015, he was elected president of the Third Social Sector of Catalonia.

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Josep A. Planell

Planell was born in Barcelona, graduated in Physics from the University of Barcelona (UB) in 1975 and earned his Doctorate in Materials Science from Queen Mary University of London, in 1983. Since 1992 he has been a full professor in the Materials Science and Metallurgy department of the Barcelona School of Industrial Engineering at the Universitat Politècnica de Catalunya (UPC). He succeeded Imma Tubella i Casadevall as President of the Universitat Oberta de Catalunya (UOC) in April 2013. In 2013, he received the George D. Winter award from the European Society for Biomaterials. Likewise, in 2001 he was awarded the Catalan government's Distinction for the Promotion of University Research and in 2006 he received the City of Barcelona award, in the technological research category. He has been a member of the Catalan Royal Academy of Doctors since 2006 and is an elected member of Barcelona's Royal Academy of Arts and Sciences. Since January 2018, he has been president of the Catalan Association of Public Universities (ACUP) and the Global University Network for Innovation (GUNi).

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Peter Wells

Peter Wells is Chief of the Section for Higher Education at the UNESCO Headquarters in Paris, which is responsible for the overall coordination of the UNITWIN/UNESCO Chairs program. The Section's other activities include: promoting quality enhancement and assurance mechanisms for higher education institutions (HEIs) and systems; the internationalization of higher education programs through the mobility of students and researchers facilitated by the five UNESCO Regional Recognitions of HE Qualifications; and the widening of access to quality HE and increasing of lifelong learning opportunities at HEIs through systematic approaches to ICT enabled learning (including open and distance learning, the promotion of MOOCs and Open Education resources). Before taking on his role as Chief of Section at UNESCO, Wells was Director of Bucharest College (BPTC), Higher Education Programme Specialist at UNECO, Academic supervisor at Higher Colleges of Technology, Lecturer at the Polish Open University, Special Education Consultant at the Council on Foreign Relations and Political Risk Analyst at Euler Hermes. Wells holds a BA in European Studies from the University of Leicester, an MSc in International Relations and Affairs from Florida State University and is a Doctor of Philosophy in Quality Enhancement in Tertiary Education from Lucian Blaga University of Sibiu.

Sustainable Development Goals: Actors and Implementation

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