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REVIEW ARTICLE

The 2030 Agenda compared with six related international agreements: valuable resources for SDG implementation

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Abstract

A recurrent problem in international organizations is the disappearance of institutional history and knowledge. The same can be said about international agreements unless the same key drafters/negotiators are involved in subsequent agreements which is rarely the case. This study provides an example how institutional memory embedded in international agreements can be preserved for the benefit of the next generation of policy negotiators. Hence, as a contribution to the broader reflection on how to align National Sustainable Development Plans with the implementation plan of 2030 Agenda, the purpose of the study is to present a comparative analysis of the 2030 Agenda with 6 outcome documents that were negotiated and agreed by the UN member countries in the domain of sustainability. This analysis aims to identify issues not covered or "unfinished business" in the 2030 Agenda and addressed in a more comprehensive manner or from different perspectives. The list of agreements and outcome documents included are Agenda 21, Programme for the Further Implementation of Agenda 21, Outcomes of the World Summit on Sustainable Development, the United Nations Conference on Sustainable Development, The Paris Agreement and the Addis Ababa Action Agenda on Financing for Development. Our findings show that these agreements tend to build on each other, not always in the most straightforward manner, but they constitute a complementary set of agreements documenting the existing knowledge and practices on sustainability development. For instance, the 2030 Agenda does not repeal Agenda 21 (1992) or any other of the six agreements analysed, which shows that these preceding international agreements are still relevant for domestication by the signatories. Rather, it is a summative document covering all three pillars of sustainable development (social, environmental and economic). Recommendations are made on what aspects of the previous agreements could be most relevant for the implementation of the 2030 Agenda. These points need to be part of the outreach in supporting countries for national implementation of the SDGs. Future research examining the interrelated aspects of international agreements could benefit from applying the same approach of comparative text analysis. This, in turn, will allow for the leveraging of prior consensus and knowledge and add deeper insights to meta-level governance toward a sustainable future. It could also be argued that once the SDGs/2030 Agenda needs to be revisited/revised and be replaced, the approach used for this comparative study could become the model to avoid reinventing the wheel and acknowledge that we are all standing on the shoulders of far-sighted public figures whose innovative thinking should be acknowledged rather than forgotten.

Keywords 2030 Agenda · SDGs · International Agreements on Sustainable Development · Comparative text analysis · Policy Coherence on Sustainable Development · International Relations of Sustainable Development

Background

Member States of the United Nations in their resolutions on implementation of Agenda 21 (United Nations 2012a), the Programme for the Further Implementation of Agenda 21 and the outcomes of the World Summit on Sustainable Development (WSSD) and of the United Nations Conference on Sustainable Development (UNCSD) have been following on these outcomes and in the resolution A/Res/71/223 of 21 December

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2016 asked for a comprehensive and substantive analysis of the unfinished business of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the outcomes of the World Summit on Sustainable Development and of the United Nations Conference on Sustainable Development.

This study is part of a broader reflection on Agenda 21, the Programme for the Further Implementation of Agenda 21 and the outcomes of the World Summit on Sustainable Development and of the United Nations Conference on Sustainable Development whether they are still relevant and necessary to advance sustainable development and to support the 2030 Agenda for Sustainable Development (United Nations 2015a) and its 17 SDGs and to also inquire to what extent the two agreements negotiated in 2015 as was the 2030 Agenda, namely the Paris Agreement and the Addis Ababa Action Agreement (AAAA), whether they are also relevant for countries who are implementing the 17 SDGs during the 2015–2030 time frame. In other words, the question pondered by this study is whether all the other six international agreements form an overarching framework together with the 2030 Agenda in a meaningful and useful manner that would allow countries to achieve sustainable development.

A special issue of Sustainability Science focused on Sustainability Science and the Implementing of the Sustainable Development Goals (SDGs) was published in 2017 (Volume 12, Issue 6, November 7). Twenty articles discussed various aspects of past achievements and proposed new avenues for the journal especially in regard to further deepening of inter-disciplinary studies on sustainability such as Rokaya et al. (2017), Stafford-Smith et al. (2017) and Coliste et al. (2017). Kajikawa et al. (2017) showed, for instance, over the last 10 years a growing trend of publications of contributions from the social sciences, natural sciences, social/natural sciences, engineering and applied sciences, and economics.

Takeuchi et al. (2017) writing about the 10 years of publishing of sustainability science research ended their conclusion by stating:

> Through strengthening the science–policy–society interface, and co-production of knowledge as well as future scenarios with innovative policy options, new relationship between the sciences and society should be explored to lead effective actions for operationalizing and implementing SDGs from local, national, regional to global scales. (p. 853)

This article follows the Takeuchi et al.'s (2017) statement suggesting that policy-makers have much to gain by understanding points of alignment and divergence among these agreements and drawing upon existing tools for effective implementation. Moreover, by adding a policy analysis of international agreements, the authors broaden the field of sustainability science research beyond the two core research clusters proposed by Kajikawa et al. (2017) in their abstract entitled "Environmental and Social Systems" and "Economy and Business Systems". The authors add political science and diplomatic analysis to the core clusters of sustainability research suggesting the existence of a third cluster for the literature on Sustainability Science, namely political and diplomatic systems along the lines of the New Diplomacies consisting of relations between state and non-state actors (Saner and Yiu 2015).

Introduction

Since the 1992 United Nations Conference on Environment and Development (UNCED) in Rio, three additional documents were deliberated and adopted by the General Assembly, namely the 1997 Programme for the Further Implementation of Agenda 21; the Outcome of the 2002 World Summit on Sustainable Development and the Johannesburg Plan of Implementation; and the Outcome of the 2012 United Nations Conference on Sustainable Development (Rio+20).

This set of documents has shaped the sustainable development agenda and has led to the elaboration of the Sustainable Development Goals (SDGs) in 2015 and the creation of the 2030 Agenda on Sustainable Development (inter alia 2030 Agenda). The SDGs build upon the achievements of the Millennium Development Goals (MDGs) and seek to address their unfinished business (Global 2030, 2016) while at the same time tackling the system vulnerability in a systemic and holistic manner. Unlike with the MDGs, the 2030 Agenda is applicable for all countries, developed and developing countries alike. In addition to the four documents that preceded the SDGs, another two international meetings were held in 2015 resulting in two additional agreements namely the AAAA of the 3rd Financing for Development Conference that took place in Addis Ababa in July 2015 and the Climate Agreement which was concluded in Paris in December 2015. Appropriate UN references and full names of these agreements are provided below and in References.

The above-mentioned documents were negotiated and concluded by the international community with the intention of providing solutions to the vulnerability and risks confronting the planet earth and mankind. The 2030 Agenda had the same intentions and provided concrete goals and targets. The question is whether these previous outcome documents that followed the 1992 Earth Summit and the two additional documents that were agreed in 2015 generated insights and solutions which were not part of the 2030 Agenda outcome document and, if so, how could these text be used as tools and inspiration for the implementation process of the 2030 Agenda in all the UN member states.

The list of outcome documents (Table 1) that were analyzed and compared to the 2030 Agenda:

Table 1 The 2030 Agenda and comparative documents/agreements

Basic document	Compared with:
The 2030 Agenda (2015)	(A) Agenda 21 (1992)
	(B) Further Implementation of 21 (1997)
	(C) The outcomes of the World Summit on Sustainable Development (2002)
	(D) The Future We Want (2012)
	(E) The AAAA agreement (2015)
	(F) The Paris Agreement (2015)

The documents analyzed and compared with the 2030 Agenda build on each other, not always in the most straightforward manner, but they should be seen in their totality as an inter-related set of documents. They are also a collection of agreements that often refer to each other and form a meaningful larger set of guidance documents that could be useful for the implementation of the SDGs. For clarification sake, the SDGs are part of the 2030 Agenda, which is the name given for the overall agreement reached in 2015 but the SDGs are not equivalent to the whole text of the 2030 Agreement.

Methodology

Content analysis was selected as the more appropriate methodology for this undertaking. It represents an advanced research method intersecting the qualitative and quantitative traditions by interpreting and coding textual material. By systematically evaluating the actual texts of selected international agreements, qualitative data were converted into quantitative data to make valid comparisons and inferences.

The basic research questions of this study are twofold: (1) Is there continuity of policy analysis and, therefore, policy recommendations within the international policy framework addressing the sustainable development challenge? (2) Seen from a knowledge management perspective, is there a specific subject matter of knowledge contained in existing policy analysis and recommendations that could be leveraged to achieve the 2030 Agenda?

The quantitative aspect of the study used the frequency counts of the occurrence regarding specific issues or thematic topics. The qualitative aspect of the methodology applied expert rating and coding when assessing the distance of divergence.

The methodology applied consists of two steps. The outcome documents were first compared in pairs for structural similarity and coded accordingly. Subsequently, specific contents were assessed in pairs to determine the degree of congruence with the 2030 Agenda document. Whenever text was identified that was not included in the 2030 Agenda document, they were recorded separately in an excel sheet for further analysis.

These textual parts were subsequently analyzed in depth and given the following assessment ratings by experts, namely

1 = mostly equivalent,
2 = more or less congruent,
3 = not very congruent, and
4 = not congruent.

What follows are the results of this series of comparative text analyses. The biggest differences were labelled category "4" gaps and were depicted using a Bar Chart to visualize the extent of the differences. A "category 4 GAP" labelled to indicate the textual segments of another outcome document was not reflected in the 2030 Agenda.

Some of the Category 4 Gaps might be less important seen from today's perspective rather than only from the 23-year time difference between the early outcome documents and the 2030 Agenda. For instance, some of the identified gaps might no longer be omissions rather subsequent international actions. For example, agreements on dangerous waste provided further guidance and an international governance framework. Stockholm Convention signed in 2001 and effective from May 2004 aims to eliminate or restrict the production and use of persistent organic pollutants (POPs) or the Minamata Convention on Mercury designed to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds signed in 2013 are two further examples. Such developments were noted in the sets of comparisons and omitted from the cited divergence and rating.

Findings

In what follows are summaries of the main findings resulting from the content analyses and text comparisons between the other outcome documents (as mentioned in Table 1 above) and the 2030 Agenda. An example of a detailed comparative content analysis is given in "Appendix 1" focusing on the comparison between Agenda 21 versus 2030 Agenda. Detailed assessments for each comparison are available on demand.

"Agenda 21" compared with the "2030 Agenda"

Agenda 21 is a very substantive document of 351 pages in word format comprising 40 chapters (arranged in 4 Sections), which address all levels of social organization in every area in which human activity impacts upon the environment. The document is intergovernmental and was

negotiated by the United Nations members as the outcome of the UNCED and adopted in 1992 by the UN General Assembly—23 years before the 2030 Agenda that was adopted by the General Assembly in September 2015.

The Agenda 21 document was a technical document which defined what Sustainable Development (SD) means and how it could be attained through concrete policies and technical steps of implementation whose progress yearly was reviewed by The United Nations Commission on Sustainable Development (CSD), a new functional commission of ECOSOC.

The implementation of Agenda 21 was primarily the responsibility of governments, through national strategies, plans, policies and procedures. International and regional organizations were also called upon to contribute to this effort. The broadest public participation and the active involvement of non-governmental organizations and other groups were encouraged. Critical to the effective implementation of the objectives, policies and mechanisms agreed by the governments in all programme areas of Agenda 21 were the commitments and genuine involvement of all institutions and social groups.

Agenda 21 was written in a systematic manner and structured into main sections cascading down to chapters, programme areas, objectives, activities, and means of implementation. It was divided into the following sections: (1) Social and Economic Dimensions, (2) Conservation and Management of Resources for Development, (3) Strengthening the Role of Major Groups and (4) Means of Implementation. Each section represented a thorough treatment of its topics detailing the methodology to be used for implementation.

In comparison, 2030 Agenda sets out a global policy framework and is less detailed and specific than Agenda 21 particularly regarding environmental sustainability and roles of multi-stakeholder actors. Seen from today's perspective, Agenda 21 could be considered an implementation guideline providing countries with guidance regarding the scientific and technical aspects of implementation of the SDGs when formulating national sustainable development plans and related policies.

Table 2 lists the number of "gaps" of varying degree between the Agenda 21 and 2030 Agenda from not congruent (Gap 4) to mostly equivalent (Gap 1).

As already explained above in "Methodology", a "gap 4" could be the absence of consideration of a topic and "Gaps 2–3" are topics that are treated differently in the two documents. The degree of difference results in the assessment ranking given in Table 2.

Agenda 21 remains very useful and is similar to other outcome documents, especially when countries attempt to reduce their environmental vulnerability and risks caused by climate change, land degradation or pollutions. For

Table 2 Summary of the comparative text analysis and assessment results between Agenda 21 and the 2030 Agenda

Assessment ranking	Incidents	
1 = mostly equivalent (Level 1 gap)	125	30%
2 = more or less congruent (Level 2 gap)	83	20%
3 = not very congruent (Level 3 gap)	86	21%
4 = not congruent (Level 4 gap)	120	29%

reference, see CEDRA (Climate change and Environmental Degradation Risk and Adaptation assessment), UNEP Environment and Vulnerability and Poverty and Climate Change Reducing the Vulnerability of the Poor through Adaptation.

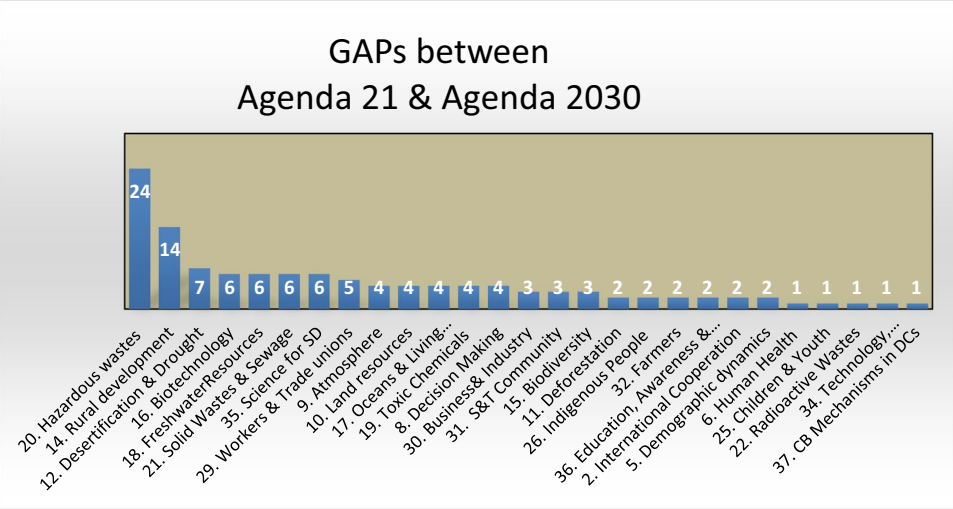
Mitigation and adaptation require detailed scientific knowledge and advanced technologies. Both might not be readily available nor accessible. Agenda 21 contains plenty of policy advice and was the first outcome document to put sustainable development within a three-dimensional perspective providing guidance on how to reduce environmental, social and economic risks and vulnerabilities. It went as far as addressing the informal economy, unemployment and poverty in addition to the environmental challenges.

For example, when it comes to Section IV Means of Implementation, Chapter 38 on International Institutional Arrangements and more specifically the UNEP, the Agenda 21 recommends: Support to Governments, upon request, and development agencies and organs in the integration of environmental aspects into their development policies and programmes, in particular through provision of environmental, technical and policy advice during programme formulation and implementation. Other international **agencies** are also guided such as UNDP and UNCTAD. However, it should be mentioned that Eckerberg and Mans (2013) wrote that "Similar to other political declarations and strategies at the global level, Agenda 21 lacks more concrete measures, practical advice and timetables".

Pointers on inclusive policies and practices

Regarding means to ensure social sustainability, countries can find a lot of inspiration in the Agenda 21 document which provides suggestions for non-discriminatory and inclusive policies and practices. It should also be highlighted that UNCED, popularly dubbed the "Earth Summit", was the first large-scale engagement of state actors and non-state development actors and contributors. The Agenda 21 text segments which discuss how major groups could be formed and how social dialogue could be successfully managed are also useful to ensure meaningful participation and fair representation of civil society (cf. Agenda 21, Ch. 23, Preamble).

Since the first United Nations Conference on Environment and Development in 1992, it was recognized that



Note: Bar Chart shows the number of assessed gaps of category 4 (not congruent with 2030 Agenda, for details see Annex 1).

Fig. 1 2030 Agenda compared with Agenda 21 in quantitative measures

achieving sustainable development would require the active participation of all sectors of society and all types of people. Agenda 21, which was adopted at the Earth Summit, drew upon this sentiment and formalized nine sectors of society as the main channels through which broad participation would be facilitated in UN activities related to sustainable development. Two decades after the Earth Summit, the importance of effectively engaging these nine sectors of society was reconfirmed and continues to be used for the 2030 Agenda. These main actors are called major groups of non-state actors (United Nations Conference on Environment and Development 1992).

Lucena and Gummer (2012) observed that it is not that leaders committed to the wrong objectives at Rio 20 years ago and in Johannesburg 10 years later. These summits led to the creation of the UN conventions on biological diversity, climate change and desertification, the principles on sustainable forestry and Agenda 21. However, the authors of this article suggest that the major problem since 1992 has been the failure of governments to implement properly their commitments from Rio and Johannesburg. Three particular parts of the jigsaw puzzle have been missing since 1992.

The specificities of main gaps compared with 2030 Agenda are illustrated in Fig. 1. In light of the fact that Agenda 21 had a strong environmental focus, it is understandable that the main gaps are in areas pertaining to environmental sustainability, such as management of hazardous wastes (24 incidents) followed by agricultural and rural development (14 incidents). A detailed analysis referring to the document itself and the gap-related chapters is given in "Appendix 1".

First, there has been a lack of domestic legislation to underpin the Rio principles and conventions. Second, there was a lack of credible and independent international scrutiny to monitor delivery. And finally, the international community failed to convert the original Rio agenda into a language that would hold sway in the most powerful departments in each government: the treasuries and finance ministries.

Table 3 presents the tabulation of frequency counts regarding divergence of specific thematic areas and chapters of the two global policy agendas.

Scientific and technical orientation in tackling social needs

Agenda 21 offers valuable guidance and pathways to achieve environmental sustainability, especially when it comes to environmental conservation, including man-made disasters (deforestation, desertification and declining biological diversity) and protection of land, ocean and water resources and overall ecosystem. The concrete technical guidance made available by Agenda 21 could be integrated into the current set of indicators of the SDGs, for instance, regarding transboundary air pollution (Section II, Chapter 4.D.).

In other words, with guidance is meant guidance for both central and local governments. Moreover, in terms of the guidance aspect, The UNCED in 1992 recognized the

Table 3 Summary of category 4 gap differences between Agenda 21 and the 2030 Agenda by themes/chapters

Themes by chapter	Category 4 gaps by frequencies	Themes by chapter	Category 4 gaps by frequencies
2. International Cooperation	2	20. Hazardous wastes, including prevention of illegal international traffic	24
5. Demographic dynamics	2	21. Solid wastes and sewage-related issues	6
6. Human health conditions	1	22. Radioactive Wastes	1
8. Integrating environment and development in decision-making	4	25. Children and youth in sustainable development	1
9. Atmosphere	4	26. Role of indigenous people and their communities	2
10. Land resources	4	29. Role of workers and their trade unions	5
11. Combating deforestation	2	30. Role of business and industry	3
12. Combating desertification and drought	7	31. Scientific and technological community	3
14. Agriculture and rural development	14	32. Role of farmers	2
15. Conservation of biological diversity	3	34. Transfer of environmentally sound technology, cooperation and capacity-building	1
16. Management of biotechnology	6	35. Science for sustainable development	6
17. Oceans and coastal areas and development of their living resources	4	36. Promoting education, public awareness and training	2
18. Freshwater resources	6	37. National mechanisms and international cooperation for capacity-building in developing countries	1
19. Toxic chemicals, including prevention of illegal international traffic	4		

important role that indicators could play in helping countries make informed decisions concerning sustainable development. At the international level, the CSD approved its Work Programme on Indicators of SD in 1995. The first two sets of CSD Indicators of Sustainable Development (henceforth CSD indicators) were developed between 1994 and 2001. The UN publication also provides guidance on applying and adapting the CSD indicators for the development of national indicator sets.

Experiences from the COP meetings of the UNFCCC have shown that such agreements are not easy to obtain be they about environmental issues or about other multi-stakeholder agreements (Saner 2008) since they require political commitment of all parties and ability to successfully engage in multi-stakeholder negotiations (Saner and Michaelun 2009).[1]

The existing targets and indicators that deal with environmental challenges, e.g. water quality (SDG 6), climate change (SDG 13), ocean resources (SDG 14), or terrestrial ecosystems, forests, desertification, land degradation and biodiversity (SDG 15) are long on social equality in terms of access, but short on technical and scientific measures in dealing with prevention and rehabilitation. Agenda 21, as shown in its chapters dealing with hazardous waste and pollutants, agricultural practices and freshwater, presented concrete suggestions in dealing constructively with man–nature–environment interfaces and kept an eye on the needs for protecting the rights of farming communities in environmental conservation (Agenda 21, Hazardous wastes (point 58).

Transparency and stakeholder participation

Agenda 21 also shaped, to a large extent, the underpinning orientation and structure of the 2030 Agenda in terms of transparency and broad-based stakeholder participation in setting policy objectives and defining operational strategies. Some Agenda 21 chapters list issues that are not discussed in the 2030 Agenda. For instance, the interactive effects of demographic dynamics, the specific technical capabilities needed such as integrated environmental and economic accounting (Section I, chapter 8.D), and pricing the use of "environmental goods" into the actual costs of products (Section I, Chapter 8.C). The latter two technical proposals could support the implementation of the SDG Goal 12, Sustainable Consumption and Production Patterns and indirectly contribute to the monetization of natural capital. Forecasted demographic changes will not only impact domestic politics and the allocation of resources and intergenerational justice but also affect international relations when it comes to ODA

[1] The report of the Secretary Geneva of The International Environmental Forum (2002) provides detailed analysis of the challenges of implementing Agenda 21. The focus of this paper is, however, on comparing 2030 Agenda with six other international agreements.

and other cross-border issues with humanitarian implications. For example, to solve the current migration crisis, both the limited amount of ODA as well as ODA itself have been tied to the home countries of the migrants working with the OECD-DAC donors to receive their countrymen being expelled, but in return receiving higher aid in sectors meant to support economic development and thereby create livelihood for the youth at their home countries (see for example Ruaudel and Morrison-Métois 2017). Discussions on these issues in Agenda 21 by environmental groups like Earthday Network or Global Footprint Network offer a higher aggregate perspective in assessing the risks to the global environmental system and offer alternative perspectives and approaches for the international discourse on sustainable development.

Rural development

Chapter 14 of Section I of Agenda 21 deals with "promoting sustainable agriculture and rural development" and provides guidance through an integrated approach to rural development, treating land, ocean, wildlife and plant protection, rural employment, infrastructure development, alternative energy, biodiversity, etc. While the 2030 Agenda reiterated these elements in its goals and targets, Agenda 21 was much more elaborate and provided concrete and practical actions and tools for follow-through actions.

Complementarity and recommendations

1. A User-Friendly Handbook based on Agenda 21 to complement the operationalizing of the SDGs

The gaps identified between Agenda 21 and 2030 Agenda could be constructively dealt with through the drafting of a synthesis guidebook which would list the gaps, check whether the gaps have been closed by subsequent treaties and offer suggestions to the policymakers and planners as to what can be done with the remaining gaps (for instance, integrating some of the Gap content into SDG indicators especially Tier III indicators or by including the gaps into a SDG implementation guidebook). The current indicators of the SDGs are not exhaustive nor conclusive as illustrated in the result framework of the post-2015 national development plans. There are target areas needing indicators that have not been defined, while the Tier II indicators are still weak in methodology and in need of strengthening.

At the national level, the technical and still useful and valid texts of Agenda 21 could be consulted by countries for locating the global SDGs in their national development strategies and provide guidance for their SDG implementation. A guidance document, for instance, an Implementation Guideline could be made as a user-friendly "instructional" handbook. This Guideline could not only amplify the usefulness of this monumental text but also further strengthen the institutional memory on "what we collectively know" and be a more effective way to manage and disseminate knowledge to the general public.

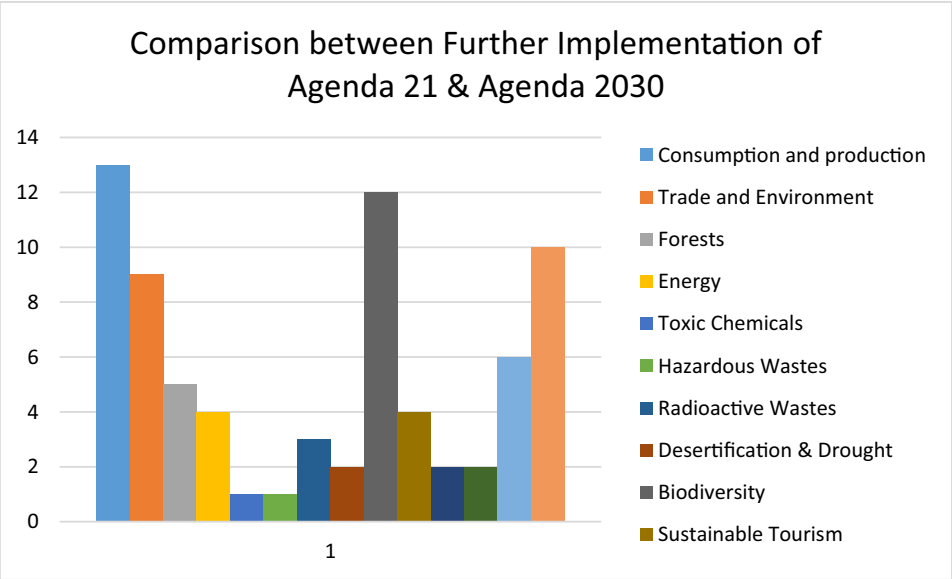
A less technical handbook based on solid instructional design could also be considered to translate the policy and technical language into daily practices of ministries, departments, and agencies as well as local government authorities on the one side and the private sector and civil society on the other side.

2. Roadmaps in partnering with major groups for SDG implementation

From a sociological perspective, similar recommendation can be made. A large number of gaps, a total of 20, were found in Section III *Strengthening the Role of Major Groups* of Agenda 21. It is interesting to note that there were no major gaps found regarding the role and functions of local authorities (Chapter 28 of the Agenda 21). Still, when implementing the SDGs, Chapter 28 on Local Authorities' Initiatives in Support of Agenda 21 could be of great complementary use for SDG implementation. Recognizing the current development trends in emphasizing the economic driver role of the megacities, defined as metropolitan areas with a total population of 10 million or more people; Agenda 21 could be of great value when it comes to the treatment of urban waste and resource efficiency.

Waste is an underlying issue throughout most of the Chapters of Agenda 21—either as a cause of a number of environmental problems or a result/output of human activities. While Chapters 20, 21 and 22 deal specifically and directly with waste issues, other chapters (4, 5, 6, 7, 8, 9, 11, 14, 16, 18, 19, 20, 24, 30, 32, and 34) deal with the impact and effect of waste on other environmental issues (Srinivas 2015).

With the exception of the local authorities, gaps were found in the chapters that delineate the roles and functions of the other seven major groups ranging from indigenous people, workers and trade unions, industry and business, farmers and children and youth. This perceptual distance might be due to the relatively new trend in broad-based citizen involvement and in many instances be reflective of the weak arrangement of the civil groups in many of the developing countries. How to harness the voices and encourage ownership of the citizenry requires collective and societal learning. Therefore, to live up to the true spirit of the 2030 Agenda, there are distances to cover. Recommendations from the Agenda 21 that suggest a more in-depth engagement of



Note: BarChart shows the number of assessed gaps of category 4 (not congruent with 2030 Agenda, for details see Annex2).

Fig. 2 Gaps Identified between the Further Implementation of Agenda 21 (1997) with the Agenda 2030

the major groups could offer valuable insights into how to build the foundations for multi-stakeholder participation and respective capacities. Finally, the three gaps identified with regard to the involvement of the science and technology community need to be urgently closed. Scientific, technological and methodological solutions are needed to successfully manage the challenges posed by the planetary vulnerabilities and risks. Research and scientific communities must contribute to the tackling of sustainability challenges. Allocation of research funds needs to be reviewed from this angle.

A special issue of Sustainability Science focused on Sustainability Science and the Implementing of the SDGs published in 2017 (Volume 12, Issue 6, November 2017) as well as other articles of the journal can provide ample examples on this issue.

In summary, it would be useful for countries to use Agenda 21 as a complementary document and inspirational resource when they are translating the 2030 Agenda into their own national sustainable development plans. Nevertheless, the gaps and potential complementarity between both documents need to be made more apparent, for instance, through the drafting of a synthesis document which shows the potential complementarity between both documents. A guidebook could be developed for the practitioners who have the responsibility of implementing the 2030 Agenda and in delivering results.

"Further Implementation of the Agenda 21" (1997) compared with "2030 Agenda"

This document entitled "Programme for the Further Implementation of Agenda 21" was adopted by the General Assembly in 1997, 5 years after the adoption of the "Agenda 21". The statements listed on page 3 of the document cited below pertaining to the need for commitments are still relevant today and are congruent with the 2030 Agenda.

> "We are convinced that the achievement of sustainable development requires the integration of its economic, environmental and social components. We recommit to working together - in the spirit of global partnership - to reinforce our joint efforts to meet equitably the needs of present and future generations." (United Nations 1997:3)

In comparison with 2030 Agenda, this document offers a detailed rationale and proposals for sector-specific actions and methods that are useful for the implementation of the 2030 Agenda and its 17 SDG goals. The gaps that have been identified between these two documents are mostly related to consumption, trade and environmental impact, actions within specific sectors and interestingly international and national institutional arrangements. A detailed account of the gaps is presented below.

Table 4 Category 4 gaps by frequencies

Themes by chapter	Category 4 gaps by frequencies ($n=55$)
A. Integration of Economic, Social and Environmental Objectives (p. 9)	
Changing consumption and production patterns (points 28 a-m)	13
Making trade and environment mutually supportive (points 29 a-i)	9
B. Sectors and issues: (p. 18)	
Forests (points 37.–41.)	5
Energy (points 42.–45.)	4
Toxic Chemicals (point 57.)	1
Hazardous wastes (point 58.)	1
Radioactive wastes (points 59.–61.)	3
Desertification and drought (points 64.–65.)	2
Biodiversity (points 66 a to l)	12
Sustainable Tourism (points 67.–70.)	4
Small Island Developing States (points 71.–72.)	2
Natural Disasters (points 73.–74.)	2
IV. International Institutional Arrangements (p. 45, points 116.–121.)	6
Role of relevant organizations and institutions of the United Nations System (points 122.–129.)	10

A. Integration of economic, social and environmental objectives (p. 9):

- Changing consumption and production patterns (points 28 a-m)
- Making trade and environment mutually supportive (points 29 a-i)

B. Sectors and issues: (p. 18)

- Forests (points 37.–41.)
- Energy (points 42.–45.)
- Toxic chemicals (point 57.)
- Hazardous wastes (point 58.)
- Radioactive wastes (points 59.–61.)
- Desertification and drought (points 64.–65.)
- Biodiversity (points 66 a-l)
- Sustainable tourism (points 67.–70.)
- Small island developing states (points 71.–72.)
- Natural disasters (points 73.–74.)

IV International Institutional Arrangements (p. 45, points 116.–121.)

- Role of relevant organizations and institutions of the United Nations System (points 122.–129.)

The sections listed above are not directly comparable in form and structure to the SDGs and its related targets. They are written like a manual but the content offered is of direct relevance to the implementation of the SDGs. For an overview of the gaps, see Fig. 2. Details of the gaps are included in "Appendix 2".

Table 4 presents the tabulation of frequency counts regarding divergence of specific thematic areas and chapters of the documents dealing with implementation issues of the Agenda 21 with the SDGs.

Global policy coherence between countries and between agreements/agendas

Since the 1997 document was agreed, changes and scientific advancements have occurred in some sectors, for instance, in forestry and energy sectors. Basic research generated new knowledge as to how the ecosystems such as ocean and weather patterns function. On the institutional front, policy coherence has been strengthened through a common review mechanism of the implementation of the 2030 Agenda. By agreeing to hold an annual High-Level Political Forum (HLPF) under the auspices of the UN ECOSOC and to encourage countries to undergo Voluntary National Reviews, the SDG process of the UN system has been reorganized and strengthened. A subsequent study as could support the strengthening of the UN institutions.

Trade and development

International trade has been identified as a major engine for development by recent studies of the World Bank Group (WBG), IMF and the WTO, for instance, the following two publications by the IMF, WBG, and WTO entitled "Making Trade an Engine of Growth for All: The Case for Trade and for Policies to Facilitate Adjustment" (2017) and by the United Nations (2016) entitled "International trade as an engine for Development".

However, quality of trade measured by decent work conditions and environmental impact is often sub-optimal, see, for instance, ILO's trade and employment studies. Hence, it is noteworthy that one of the gaps identified between the Further Actions and 2030 Agenda falls in the domain of trade in environmental goods and services. This sector of the 1997 document offers guidance on "responsible conduct" making trade and environment mutually supportive and thereby going beyond the current scope of trade as conceived by the WTO and the WBG.

Role of consumers and citizens in achieving SDGs

Finally, the role of the consumer was addressed extensively in the Programme for Further Implementation. In the market economy, consumer choice eventually holds sway over the choice of products produced and services provided. These could be seen as backlash of Nike's use of child labour in Indonesia and Shell's environmental devastation of oil exploitation in Niger (Harsono 1996; Ellyatt 2016).

Complementarity and recommendations

The 1997 document "Programme for the Further Implementation of Agenda 21" includes sector-specific recommendations and guidance that should be considered when implementing the 2030 Agenda. It represented the lessons learned since the adoption of Agenda 21 and the attempts of putting green development into practices as suggested above; it would be worthwhile to consider:

1. Incorporating the gaps between the 1997 document and 2030 Agenda relating to the root causes of the environmental problems into the 2030 Agenda into the SDG indicators.
2. Incorporating the more technically oriented gaps into a toolbox or guidance document for SDG knowledge sharing, capacity building and implementation.
3. Efforts of transformation need to pay greater attention to the consumers who are central to the transformative change. The 2030 Agenda is a people's agenda and requires grassroots mobilization and commitment. Material for public education could effectively adopt the points made in the Further Implementation.

"Implementation of the World Summit on Sustainable Development" (2002) compared with the 2030 Agenda

The third agreement to be compared is the "Plan of Implementation of the World Summit on Sustainable Development" (2002), 10 years after the initial global agreement on an Agenda 21.

Table 5 Category 4 gaps and chapters not included in 2030 Agenda

1. Sustainable Development of SIDS (pp. 36–38)
2. Sustainable Development in Africa (pp. 38–44)
3. Means of implementation discussing the roles and functions of WTO, HIPC, Bretton Woods institutions (pp. 45–54)
4. Institutional Framework for Sustainable Development (pp. 60–69)
5. A listing of items concerning strengthening institutional framework for Sustainable Development at national level (pp. 69–71)

At its fourth session, held in Bali, Indonesia, from 27 May to 7 June 2002, the CSD acting as the preparatory committee for the World Summit on Sustainable Development decided at its final meeting to transmit the agreed draft Plan of Implementation to the World Summit on Sustainable Development for further deliberations (note by the Secretariat, A/CONF.199/L.I).

The official title of this document is "Plan of Implementation of the World Summit on Sustainable Development", negotiated by the UN member States at World Summit on Sustainable Development in Johannesburg and adopted there in September 2002. It was also made reference to as Johannesburg Plan of Implementation (JPOI). JPOI was subsequently endorsed by the General Assembly at its 57th session on 20 December 2002 (A/RES/57/253) and then published in the same year, 5 years after the document entitled "Further Implementation of the Agenda 21" in 1997.

This 2002 JPOI built on "Agenda 21" and "The Further Implementation of the Agenda 21" and continued the global dialogues amongst the government, business communities and the civil society organizations. A comparison with "2030 Agenda" should take into account that many issues that are part of the 2030 Agenda were not included in the MDGs except for the issues pertaining to poverty eradication and health. It is thus fair to say that the 2030 Agenda is more comprehensive and deals with the broader context of the survivability of our ecosystem. Nevertheless, gaps remain between this pair of documents. It is worth highlighting a few of the 2002 document's chapters that are not adequately matched by the 2030 Agenda and need to be taken into consideration (see Table 5).

Vulnerability of small island developing states

In view of the frequencies of extreme weather patterns caused by global warming and its devastating impact on small island development states (SIDS) (see GIZ 2017), it is noteworthy that there is a discrepancy between the JPOI and 2030 Agenda. Special needs of the SIDS are addressed in the 2030 Agenda and are mentioned in the Section dealing with Means of Implementation (p. 10, para. 42) and again in

the Section of Means of Implementation and Global Partnership (p. 28, para. 64).

Small Island States are at the frontlines of climate change as reiterated at the most recent UNFCCC (COP24) in Katowice, in Poland, from 2 to 14 December 2018, with their security and survival threatened by the impacts of climate change on food security, fisheries, floods and droughts and weather disasters, ocean acidification, population migration. Needs of the SIDS are also at the forefront of the call for a 'Green/Blue economy' because the SIDS are natural resource economies and could face major setbacks when global temperature and weather patterns continue to change. Reducing greenhouse gas emissions globally and through environmental conservation, such as sea and oceans, are vital for their sustainability and survival.

The 2030 Agenda reaffirms the SAMOA (SIDS Accelerated Modalities of Action) Pathway which is a blueprint for SIDS and as it was adopted in 2013 it is much more relevant and more concrete than the 2002 JPOI. However, Agenda 21 and JPOI were both important for SIDS because the two documents recognized their special status and particular precariousness. Today, the Barbados Plan of Action, Mauritius Strategy and now SAMOA Pathway are the documents focused solely on the needs and challenges of SIDS. Therefore, while the discrepancies exist there was no need to have details of that in global documents related to all countries such as JPOI and 2030 Agenda.

With this said, one would argue that the special needs of the SIDS only come to the forefront of global attention when there is yet again a natural disaster. The needs for financial assistance for the SIDS should not be underestimated. The funding gap could be worrisome in climate mitigation and adaptation and in leveraging their natural resources. Keeping the special challenges faced by SIDS and their blue economic potential front and centre in the global consciousness remains of key importance for global sustainability. Therefore, the 2030 Agenda and its passage related to SIDS serve as an important reminder of the people living on the SIDS and of their rights to survival and development. This particular aspect was overlooked in the JPOI.

Validation and complementarity

Other gaps between the 2002 JPOI and 2030 Agenda mentioned in Table 5 could be further analyzed in a separate study to see whether the gaps are still valid today. For instance, the topics of development paths of Africa, specific tasks and changing roles of Bretton Woods Institutions, WTO and additional challenges facing HIPC as well as the gaps pertaining to strengthening the institutional framework needed for sustainable development remain pertinent in today's context. International cooperation and capacity-building support to developing countries remain topical for the realization of the whole 2030 Agenda.

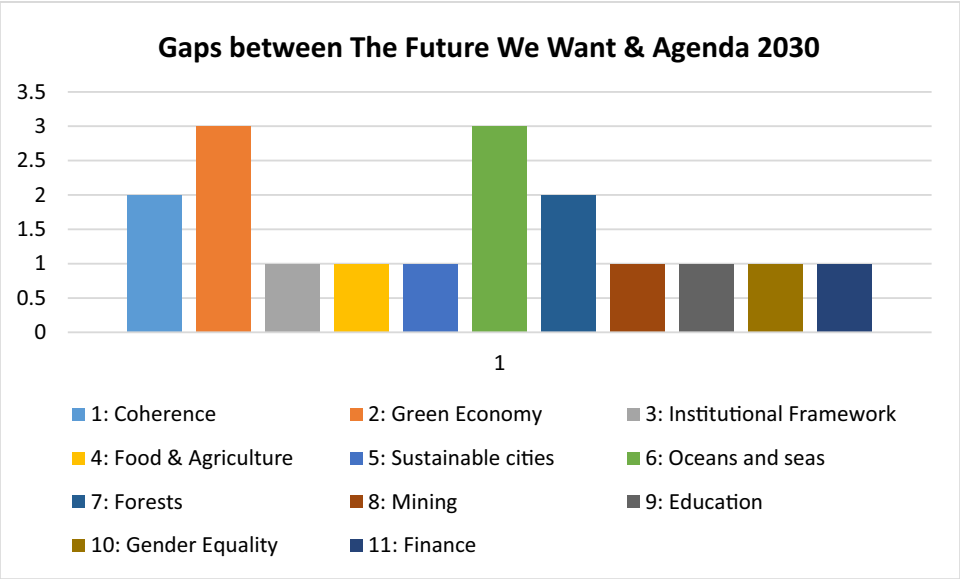
Table 6 Summary of the text analysis and assessment results comparing the "The World We Want" and the 2030 Agenda

Assessment ranking	Incidents	
1 = mostly equivalent (Category 1 gap)	39	35%
2 = more or less congruent (Category 2 gap)	34	30%
3 = not very congruent (Category 3 gap)	22	20%
4 = not congruent (Category 4 gap)	17	15%

In this context, it is worth noting that JPOI has given extensive attention to the question of partnership and international cooperation. The term, international cooperation, was mentioned 22 times covering a wide range of issues ranging from energy to trade and productivity improvement, from dealing with geospatial challenges of mountains and landlocked countries, desert to deforestation and environmental management and protection, from debt crisis to access to financing. Some of the issues have been captured in the 2030 Agenda as in Targets 2a, 4c, 6a, 7a, 16a and 17.6. Yet, it remains relevant to read the deliberation and technical guidance provided in the JPOI text relating to international cooperation and to a lesser extent partnership between the state and with the private sector. Principle 7 of the Rio Declaration on Environment and Development was reaffirmed in JPOI and should be quoted here:

> "States shall co-operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."

Achieving sustainable development is an expensive undertaking. States need to be reminded of their shared responsibility in shouldering the burden and in sharing the agreed "common" resources such as environmental technology to make the 2030 Agenda work for all. JPOI's reaffirmation of Principle 7 which was again repeated in Paragraph 12 of the Section on "Our shared principles and commitments" of the 2030 Agenda highlighted the policy lineage between the set of documents understudied.



Note: Bar Chart represents the number of assessed gaps of category 4 (not congruent with 2030 Agenda).

Fig. 3 The Future We Want versus the 2030 Agenda

"The Future We Want" (2012) compared to the 2030 Agenda

It is a document which was adopted at the UN Conference on Sustainable Development in 2012 and endorsed by the General Assembly at its 66th session on 22 July 2012 (A/RES/66/288), 10 years after the adoption of the Plan of Implementation of the World Summit on Sustainable Development (2002).

Table 6 summarizes the frequency of discrepancies, or gaps, and respective rating of this comparison between the "The World We Want" and 2030 Agenda.

In continuation of the previous three documents, namely Agenda 21 (1992), Further Implementation of Agenda 21 (1997) and the Outcome document of the World Summit on Sustainable Development (2002), this document titled "The Future We Want" (United Nations 2012b) raises similar issues as the 2030 Agenda. Major divergence (Category 4 Gap) between the two documents is relatively small representing only 15% of the gaps (Table 7).

For example, Green Economy which has been emphasized in the "The Future We Want" includes sections which are linked to environmental issues that are not directly mentioned in the 2030 Agenda but are nevertheless implied by the 2030 Agenda. A similar remark could be made concerning the health of Oceans and Seas and Forests. The assessed gaps are depicted in Fig. 3.

Table 6 summarizes the frequency of discrepancies, or gaps when comparing between the "The World We Want" and 2030 Agenda. Altogether, 17 gaps were identified ranging from policy integration to food security, gender equality to the environment (Table 7).

Integration, implementation and coherence

"The Future We Want" document also highlights an area which is not equally developed in the 2030 Agenda, namely Advancing Integration, Implementation and Coherence. This gap has recently been highlighted in the Secretary General's Progress report towards the Sustainable Development Goals, 11 May 2017 (E/2017/66, United Nations 2017a).

No conditionality

It is significant to note that governments are cautioned against setting conditionalities.

When envisioning the achievement of a Green Economy, the report calls for avoiding "unwarranted" conditionalities of official development assistance and finance (Par. 58 (g)). It also calls for reducing the potential negative spillover effects of the transition to the Green Economy through the use of best available scientific data and analysis (par. 12).

The purpose of the SDG Index and Dashboards is to assist countries to identify priorities for action, to achieve the 17 SDGs. The indicators and dashboards should help

Table 7 Themes of document and frequency of category 4 gaps

Themes	Gaps by frequencies	Themes	Category 4 gaps by frequencies ($n=17$)
1: Advancing integration, implementation and coherence	2	6: Oceans and seas	3
		7: Forests	2
2: Green Economy	3	8: Mining	1
3: Institutional Framework	1	9: Education	1
4: Food Security, Nutrition and Sustainable Agriculture	1	10: Gender Equality and Women's Empowerment	1
5: Sustainable cities and human settlements	1	11: Finance	1

countries to pinpoint key implementation challenges and the overall index permits an assessment of progress towards the goals and a comparison with peer countries. Large number of countries are stepping forward to make Voluntary National Reports on their progress in implementing the SDGs at the High-Level Political Forum. We also note that the design and implementation of the official SDG indicators is making significant progress following their formal adoption by the UN Statistics Commission. The SDG Index and Dashboards are complementary to official SDG monitoring.

Development patterns of the rich countries may generate adverse "spillovers" that may hinder the ability of poorer countries' to achieve the SDGs. For example, the high consumption levels, banking secrecy and tax havens, and weapons exports, by the rich countries may severely inhibit sustainable development in poorer and more vulnerable countries. On the other hand, international development finance by key development partners also directly supports the SDGs. Many of the adverse spillovers tend to be neglected or poorly measured in official development statistics. The 2017 SDG Index and Dashboards, therefore, reviews the scientific and policy literature to identify the best available data for quantifying such complex spillovers. We show that there are indeed many such adverse global spillover to consider and that they are indeed driven strongly by high-income countries (SDG Index and Dashboard Report 2017).

Social economy models

Specific reference has been made to different business models, such as cooperatives and microenterprises (point 14, p. 13), that could contribute to social inclusion and poverty reduction for people in the developing countries and people at the bottom of the pyramid in developing and developed countries.

Monitoring these alternative forms of organizing the economy would ensure a trickledown effect of economic growth but also provide the marginalized and vulnerable population and communities with a proactive opportunity to productively participate in the economy.

"Addis Ababa Action Agenda" (AAAA) compared with the 2030 Agenda

This set of comparison will focus more on the financing aspect of development. The negotiated outcome document of the Third International Conference on Financing for Development, i.e., Addis Ababa Action Agenda (or short AAAA (United Nations 2015b)) is a document of 37 pages that was issued on 17th August 2015. It was adopted by the UN General Assembly on 27th July 2015 (A/RES/69/313) shortly before the 2030 Agenda was adopted on 25th September the same year.

AAAA is a document that focuses on the financing aspect of the development in a broad sense and international development cooperation in a narrow sense. It reflected the shifting wealth and the changing global landscape of economic power of the traditional donor countries and the emerging economic power of other new actors since the First International Conference on Financing for Development took place in Monterrey in 2002 and later the Second Conference in Doha in 2008 to review the implementation of the Monterrey Consensus.

The Monterrey Consensus in the words of then Secretary-General Ban Ki-moon during the Doha Conference marked "a new era of cooperation, bridging the old North–South divide".

The Doha Declaration (United Nations General Assembly 1997), an outcome of the Second International Conference highlighted the following aspects of the international cooperation regarding financing of development:

- *Domestic resource mobilization* The importance of national ownership of development strategies and of an inclusive financial sector, as well as the need for strong policies on good governance, accountability, gender equality and human development.

- *Mobilizing international resources for development* The need to improve the enabling environment and to expand the reach of private flows to a greater number of developing countries.
- *International trade as an engine for development* The importance of concluding the Doha round of multilateral trade negotiations as soon as possible.
- *External debt* The need to strengthen crisis prevention mechanisms and to consider enhanced approaches for debt restructuring mechanisms.
- *Addressing systemic issues* The need to review existing global economic governance arrangements, with a view to comprehensive reforms of the international financial system and institutions.

These themes continue to dominate the international discourse on financing and international cooperation. The agreement reached in Addis Ababa gives strong suggestions for private sector engagement and private capital mobilization at national and international levels.

As a document, AAAA is not structured by themes or sections but instead is numbered in more traditional style of written agreements. Hence, the text comparison requires a more nuanced reading and analysis. Since AAAA has been designed to complement the financial side of the 2030 Agenda, a number of issues that are not addressed in the 2030 Agenda are instead part of AAAA (Fig. 4).

The focus of AAAA is more narrowly concentrated on financing and development issues, such as access to financial services (p. 13, par. 39), extractive industry and international tax cooperation (p. 9/10, par. 29) but also other issues such as entrepreneurship training (p. 6/7, par. 16) and national youth strategies (p. 6/7. Par. 16). These recommendations targeting the youth fall under the category of "employment, decent work for all and social protection" of the AAAA.

Financing for sustainable business development

The AAAA offers guidance on a range of initiatives. It provides guidance on how to develop a robust domestic financial market for sustainable business development which will be a key institutional infrastructure development and economic growth. Guidance is offered on the development of domestic capital markets for developing countries especially for the special needs countries, such as landlocked developing countries (LLDCs) and SIDCs (chapter dealing with Domestic and International Private Business and Finance, p. 14, par. 44).

Responsible business conduct

Recommendations are also pertinent in regard to the areas of Responsible Business Conduct concerning impact investing (p. 12, par. 37) to avoid the shortcomings of imbalance and fragmentation of social systems caused by the new culture of hypercapitalism as witnessed in the US during the sub-prime financial crisis (Reinhart and Rogoff 2008; Kolb 2011) or as Alan Greenspan famously said, irrational exuberance. Innovative financing will be crucial to innovative undertaking from products to services to social institutions. Yet good governance through fairness, transparency and accountability in dealing with tax, financial transactions and other related issues must be in place to support the performance of an efficient and effective financial market. This is stressed (23 times in the outcome document).

Table 8 Summary of the gaps between AAAA and the 2030 Agenda

Assessment ranking	Incidents	
1 = mostly equivalent (gap 1)	30	43%
2 = more or less congruent (gap 2)	16	23%
3 = not very congruent (gap 3)	5	7%
4 = not congruent (gap 4)	18	26%

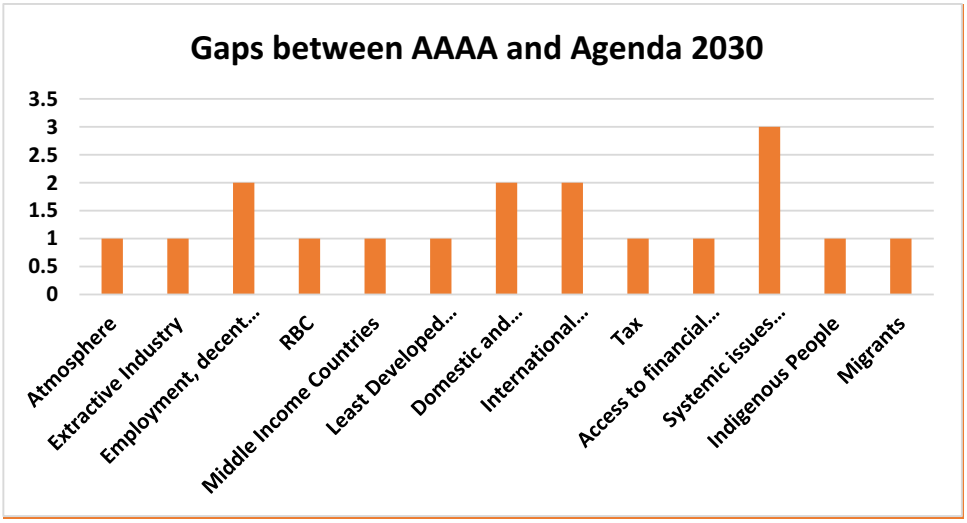
Dialogue Forums

It is worth noting that the AAAA proposes forums at different levels, i.e., regional, interregional and global levels to coordinate international actions for infrastructure investment (p. 6, par. 14), and for knowledge sharing and data gathering (p. 14, par. 44). These forums could serve as cornerstones for policy negotiation and trade-offs in view of the interdependent nature of the 2030 Agenda and its interlocking goals and targets. In view of the annual financing shortfall of 2.25 trillion USD per annum according to the estimates of UNCTAD's World Investment Report 2014, efficient allocation and use of funds across different jurisdictions and territories are urgently needed.

To ensure successful functioning of these policy coordination and alignment mechanisms, dedicated resources need to be provided for data collection, analysis and outreach in addition to hosting of meetings. In the text of the AAAA, paragraph 123 stated the following decision:

> "123. We decide to establish a *Technology Facilitation Mechanism*. The Mechanism will be launched at the United Nations summit for the adoption of the post-2015 development agenda to support the sustainable development goals." (Italic added)

The document then proceeds and lays out the mission, tasks, compositions and meeting timetable in quite some details.



Note: Bar Chart represents the number of assessed gaps of category 4v

(not congruent with 2030 Agenda)

Fig. 4 AAAA compared with the 2030 Agenda

Systemic vulnerability and recommended remedy

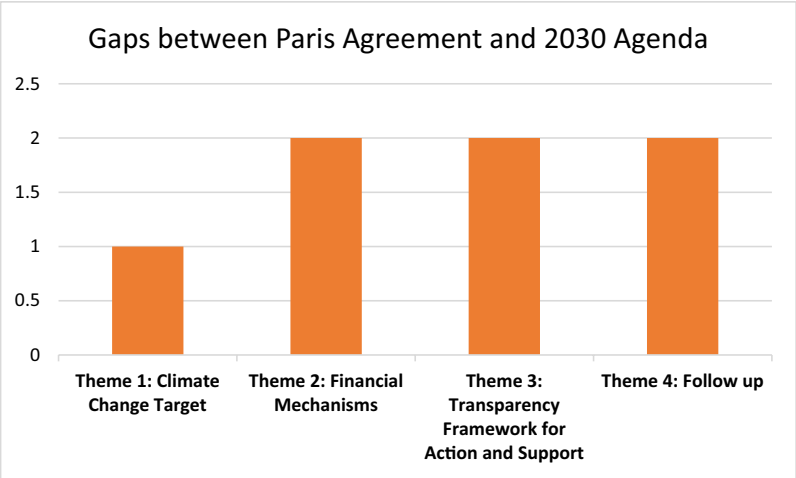
AAAA gives special attention to the financial system and the vulnerabilities that are not spelt out in detail in the existing SDG targets and indicators relating to finance for development. These AAAA text segments could be incorporated into the existing list of indicators for measuring progress of the financial targets of SDG 17 particularly Targets 17.l–17.5 of the 2030 Agenda.

Data deficit and monitoring

Lastly, Section III of the AAAA, "Data, Monitoring and Follow Up" goes on at great length to address the data deficit of the SDG implementation from Paragraph 125–134. These paragraphs greatly supplement the SDG Target 17.18 which states as operational objective that "By 2020, enhanced capacity-building should support developing countries, including least developed countries (LDCs) and SIDSs, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location

Table 9 Summary of category 4 gaps between AAAA and the 2030 Agenda by themes

Themes	Category 4 gaps by frequency ($n=18$)
Atmosphere	1
Extractive Industry	1
Promoting full and productive employment, decent work for all and social protection	2
Responsible Business Conduct (RBC)	1
Middle-income countries	1
Least developed countries	1
Domestic and international private business and finance	2
International development cooperation	2
Tax	1
Access to financial services	1
Systemic issues (International financial issues and framework)	3
Indigenous people	1
Migrants	1



Note: Bar chart represents the number of assessed gaps of category 4 (not congruent with 2030 Agenda).

Fig. 5 Paris Agreement versus the 2030 Agenda

and other characteristics relevant in national contexts". Section III of the AAAA can greatly strengthen the Targets 17.18 of 2030 Agenda. By adopting and translating proposed actions in Section III into measurable indicators Targets 17.18 can then be put into action and transformed into an instrument for improvement and transformation.

Table 8 presents a rating of the findings when comparing AAAA and 2030 Agenda. While by and large, the gaps found were relatively insignificant, 26% of the gaps are significant enough to warrant serious consideration.

Table 9 provides the thematic details of the gaps found. The more frequently sighted gap has to do with systemic issues dealing with financing and institutional frameworks.

"Paris Agreement" compared with the 2030 Agenda

The Paris Agreement was concluded in Paris on 12th December (2015), 3 months after the adoption of the 2030 Agenda. It reflects the need of the negotiators to remain broad to reach an agreement that could be signed by all parties (member countries) to the Convention.

Climate change and sustainable development are inextricably linked. Despite this fact, there is no formal interrelationship between their designated international processes, namely the United Nations Framework Convention on Climate Change (UNFCCC) and the 2030 Agenda for Sustainable Development. On the one hand, the 2030 Agenda contains SDGs, which include an SDG on climate change (SDG 13). However, SDG 13 expressly acknowledges that the "UNFCCC is the primary international, intergovernmental forum for negotiating the global response to climate change". On the other hand, while the UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA) acknowledges the "importance and interlinkages" of climate and the sustainable development agenda, the reality is that the UNFCCC's secretariat merely "follows the latter, recognising that they are two separate but parallel processes" (Leong 2015).

Table 10 Summary of the text analysis and assessment results between Paris Agreement and the 2030 Agenda

Assessment ranking	Incidents
1 = mostly equivalent (gap 1)	17
2 = more or less congruent (gap 2)	18
3 = not very congruent (gap 3)	5
4 = not congruent (gap 4)	7

Table 11 Summary of category 4 gaps found in the text analysis and assessment results

Themes	Category 4 gaps by frequencies ($n = 7$)
Theme 1: Climate Change Target	1
Theme 2: Financial Mechanisms	2
Theme 3: Transparency Framework for Action and Support	2
Theme 4: Follow-up	2

The Paris Agreement is 25 pages long and structured in form of articles, not by themes or other categories. Similarly, to the AAAA document, emphasis is made on financial aspects but here specifically related to environmental and developmental issues which are also part of SDG 13 but less detailed (Fig. 5). Of particular difference are the Intended National Determined Contributions (INDC) which require all Parties to the Paris Agreement to put forward their best efforts to pursue domestic mitigation measures and the commitment of developed countries to provide financial resources to assist developing country Parties with respect to both mitigation and adaptation.

Table 10 provides a summary overview of the comparison between the Paris Agreement and 2030 Agenda. In total 47 occurrences of gaps were found.

Article 4, paragraph 1(c) of the UNFCCC requires the parties to cooperate to reduce greenhouse gas emissions in the energy, transport, industry, agriculture, and forestry sectors. These correspond to SDG 7 (energy), SDG 11 (cities), SDG 9 (industrialization), SDG 2 (agriculture), and SDG 15 (forests). Further, Article 4, paragraph 1(d) of the UNFCCC requires the parties to cooperate with respect to biomass, forests and oceans, and other terrestrial, coastal and marine ecosystems. These correspond to SDG 14 (oceans, seas and marine resources) and SDG 15 (terrestrial ecosystems, forests, desertification, land degradation and biodiversity) (Leong 2015).

Dzebo et al. (2017) argue that while the Paris Agreement and the 2030 Agenda resulted from separate negotiations, both reflect an understanding that development does not take place in a vacuum: the steps we take to reach one development goal can have significant implications for our other development ambitions. Dzebo et al. (2017) refer to the new Nationally Determined Contributions (NDCs) (which sets out countries' individual commitment to achieve the Paris targets)—SDG tool developed by Stockholm Environmental Institute (SEI) and the German Development Institute (DIE), which analyses and quantifies the points of connection between the NDCs and the SDGs (at the level of headline goals and individual targets). In doing so, the tool identifies potential points of synergy and opportunities for coordinated and coherent policy-making that can promote more effective and ambitious implementation of both agendas (Dzebo et al. 2017).

Of the major gaps identified in our study, it is worth noting that themes relating to financial mechanisms, transparency framework for action and support and proposed follow-ups offer additional specifications for the 2030 Agenda set out in SDG Goal 13 and 17 and other segments deals with clean water (SDG Goal 6), affordable clean energy (SDG Goal 7), for instance, see Table 5.

Table 11 provides a thematic overview of the two documents where gaps occur and related frequencies. As the Paris Agreement followed in close step after the conclusion of the 2030 Agenda, it is not surprising to see higher congruence between the two documents. In total only 7 gaps were found.

Financial mechanisms

Regarding Theme 2 (financial mechanisms), the major differences with 2030 Agenda are with the following two paragraphs:

1. Making finance flows consistent with a pathway towards low greenhouse gas emission and climate-resilient development (p. 3, art. 2, par. 1. (c).).
2. Parties, including regional economic integration organisations and their member states, that have reached an agreement to act jointly under paragraph of this article shall notify the secretariat of the terms (p. 5, art. 4, par. 16)

Transparent actions and reporting

The other two thematic areas are Transparency Framework for Action and Support (Theme 3) and Follow-up (Theme 4). Both thematic areas cover the obligations of the parties concerning cooperation and reporting. Signatory parties to the Paris Agreement *shall* strengthen capacity building support (p. 7, art. 7, par. 7) and provide specific information on financial, technology transfer and capacity building support to developing countries (p. 17, art. 12, par. 9). Where national initiative is concerned, countries *shall* communicate them every 5 years in addition to the climate impact and adaption (p. 17, art. 13, par. 8).

The Paris Climate Agreement (COP21) highlights to some extent aspects about the environment which were already addressed in Agenda 21 albeit without the use of the same language. The international political response to climate change began at the Rio Earth Summit in 1992, where the 'Rio Convention' included the adoption of the UNFCCC. The main objective of the annual Conference of Parties (COP) is to review the Convention's implementation (UN Habitat 2015). It is worthwhile remembering that the 2015 Paris talks were the 21st meeting of the parties to the 1994 UNFCCC. This mega summit 23 years ago laid down the architecture of several environmental agreements and declarations hugely relevant today. A bit of an over-achiever of a conference, the outcomes of the Earth Summit included the Rio Declaration, Agenda 21, Forest Principles, UNFCCC, the Convention to Combat Desertification and the Convention on Biodiversity. Taken together, these documents laid the ground for much of today's environmental architecture (Quint 2015).

Table 12 Cross-comparison of all documents with 2030 Agenda and category 4 gap identified

Basic Document	Compared with:					
2030 Agenda (2015)	(A) The Agenda 21 (1992) ($N=120$)	(B) Further Implementation of 21 (1997) ($n=55$)	(C) The outcomes of the World Summit on Sustainable Development (2002)	(D) The Future we want (2012)	(E) The AAAA agreement (2015) ($n=18$)	(F) The Paris Agreement (2015) ($n=7$)
Preamble: People, Planet, Prosperity, Peace and Partnership						
Declaration: introduction, vision, shared principles & commitments, world today	8. Integrating environment and development in decision-making ($n=4$)					
The new agenda, Means of implementation Follow-up and review	5. Demographic Dynamics ($n=2$)		2. Sustainable Development in Africa (pp. 38–44)			Theme 3: Transparency Framework for Action and Support ($n=2$)
A call for action to change our world			1. Sustainable Development of SIDS (pp. 36–38)			
Sustainable Development Goals and Targets				2: Green Economy ($n=3$)		
Goal 1. End poverty in all its forms everywhere						
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture	14. Agriculture and rural development ($n=14$)					
Goal 3. Ensure healthy lives and promote well-being for all at all ages	20. Hazardous wastes, including prevention of illegal international traffic ($n=24$) 6. Human health conditions ($n=1$)					
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all						
Goal 5. Achieve gender equality and empower all women and girls						

Table 12 (continued)

Basic Document	Compared with:					
2030 Agenda (2015)	(A) The Agenda 21 (1992) ($N=120$)	(B) Further Implementation of 21 (1997) ($n=55$)	(C) The outcomes of the World Summit on Sustainable Development (2002)	(D) The Future we want (2012)	(E) The AAAA agreement (2015) ($n=18$)	(F) The Paris Agreement (2015) ($n=7$)
Goal 6. Ensure availability and sustainable management of water and sanitation for all	21. Solid wastes and sewage-related issues ($n=6$)					
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all						
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for al					Promoting full and productive employment, decent work for all and social protection ($n=3$)	
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation						
Goal 10. Reduce inequality within and among countries						
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable						
Goal 12. Ensure sustainable consumption and production patterns		28. Changing consumption and production patterns (points 28 a -m) ($n=13$)				
Goal 13. Take urgent action to combat climate change and its impacts	9. Atmosphere ($n=4$)					
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development	18. Freshwater resources ($n=6$)			6: Oceans and seas ($n=3$)		

Table 12 (continued)

Basic Document	Compared with:					
2030 Agenda (2015)	(A) The Agenda 21 (1992) ($N=120$)	(B) Further Implementation of 21 (1997) ($n=55$)	(C) The outcomes of the World Summit on Sustainable Development (2002)	(D) The Future we want (2012)	(E) The AAAA agreement (2015) ($n=18$)	(F) The Paris Agreement (2015) ($n=7$)
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	12. combating desertification and drought ($n=7$) 10. Land resources ($n=4$) 11. Combating deforestation ($n=2$) 22. Radioactive Wastes ($n=1$)	34–41. Forests (points 37.–41.) ($n=5$) 66. Biodiversity (points 66 a to l) ($n=12$)				
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels			5. A listing of items concerning strengthening institutional framework for Sustainable Development at national level.			
Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development-Finance	30. Role of business and industry ($n=3$)	3			Domestic and international private business and finance ($n=2$)	Theme 2: Financial Mechanisms ($n=2$)
Technology	35. Science for sustainable development ($n=6$) 16. Management of biotechnology ($n=6$)					
Capacity-building						
Trade		29. Making trade and environment mutually supportive (points 29 a - i) ($n=9$)				
Systemic issues						
-Policy and Institutional Coherence		116–121. International Institutional Arrangements (p.45, points 116.–121) ($n=6$)	4. Institutional Framework for Sustainable Development (pp. 60–69)		Systemic issues (International financial issues and framework) ($n=3$)	

Table 12 (continued)

Basic Document	Compared with:					
2030 Agenda (2015)	(A) The Agenda 21 (1992) ($N=120$)	(B) Further Implementation of 21 (1997) ($n=55$)	(C) The outcomes of the World Summit on Sustainable Development (2002)	(D) The Future we want (2012)	(E) The AAAA agreement (2015) ($n=18$)	(F) The Paris Agreement (2015) ($n=7$)
-Multi-stakeholder partnerships	29. Role of workers and their trade unions ($n=5$) 26. Role of indigenous people and their communities ($n=2$) 25. Children and youth in sustainable development ($n=1$)					
-Data, monitoring and accountability						
Means of implementation and the Global Partnership	2. International Cooperation ($n=2$)	122–129. Role of relevant organizations and institutions of the United Nations System (points 122.–129) ($n=10$)	3. Means of implementation discussing the roles and functions of WTO, HIPC, Bretton Woods institutions (pp. 45–54)		International development cooperation ($n=2$)	
Follow-up and review						Theme 4: Follow up ($n=2$)

Conclusion

The comparisons made between 2030 Agenda and the other six outcome documents were assessed based on the following categories, namely

1 = mostly equivalent (gap 1),
2 = more or less congruent (gap 2),
3 = not very congruent (gap 3), and
4 = not congruent (gap 4).

The strongest incongruence between 2030 Agenda and another outcome document was labelled a "category 4 gap" and subjected to further scrutiny. Table 12 presents a cross-agreement comparison in terms of the major gaps and areas for complementarity and further consideration.

The set of documents compared should not be considered as superseded by the 2030 Agenda, instead the prior outcome documents should be seen as a repository of knowledge and methodologies that will support and guide the implementation of the 2030 Agenda.

The 17 SDGs and the related 169 targets have been finalized. According to the Inter-Agency Expert Group for SDGs (IAEG-SDG), depending on the level of methodological development and the availability of data at the global level, the indicators identified in measuring the distance to targets are not fully developed nor identified. A three-tier system is used to signal the readiness for deployment.

Tier 1 Indicators are conceptually clear, have an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 percent of countries and of the population in every region where the indicator is relevant.

Tier 2 Indicators are conceptually clear, have an internationally established methodology and standards are available, but data are not regularly produced by countries.

Tier 3 No internationally established methodology or standards are yet available for these indicators and the methodology/standards are being (or will be) developed or tested.

For Tier I and II indicators, the availability of data at the national level may not necessarily align with the global tier classification and countries can create their own tier classification to facilitate the tracking and reporting progress of implementation. This has been done by means of a so-called national monitoring and evaluation (M&E) plan, including a result matrix, as an integral part of implementing the national development plan.

As of 20 April 2017, the updated tier classification scheme contains 82 Tier I indicators, 61 Tier II indicators and 84 Tier III indicators, totalling 227 indicators. In addition, there are 5 indicators that have multiple tiers (different components of the indicator are classified into different tiers). For achieving the ambitious but necessary 2030 Agenda, appropriate measurements in the form of indicators are critical in addition to the financial resources in getting the job done. Therefore, the main contribution of this comparative study lies with the "knowledge gaps" identified amongst the set of outcome documents consulted for this study.

The "gaps" mapped the areas where knowledge and methods already exist. No need to reinvent the wheel when developing a national sustainable development plan. In the case of Agenda 21 and related subsequent documents, a large number of proposals and recommendations have already been tested in different national contexts. Therefore, they serve as valuable resources for countries to consider when thinking of their own SD strategy and related policy choices.

United Nations Economic Commission for Africa (UNECA) conducted a review and appraisal of the implementation of Agenda 21 in Africa taking into account the various preparatory processes and consultations that have taken place in Africa towards the World Summit on Sustainable Development. The paper also outlines UNECA's role in the implementation of the Regions Sustainable Development Programmes and Policy Implications for the Organisation.

The foregoing analysis has demonstrated the relevance of these older sets of international outcome agreements regarding sustainable development. They are superseded by the 2030 Agenda as a global policy document. However, the other outcome document's technical values and validity by and large remain relevant and therefore can be seen as an integral part of the SD knowledge bank. Wherever it is appropriate and needed the additional knowledge bank could be drawn upon to support various country initiatives in mainstreaming 2030 Agenda into day-to-day practices.

In the context of international cooperation, partner countries can refer to this set of documents for ideas and for better articulation of needs and solution generation. Only when countries take ownership based on technical competence, collaboration and partnerships can happen that leads to more sustainable results and intended impact.

Another worthwhile use of this study relates to the Secretary General's 2017 progress report on "Repositioning the UN Development System to Delivery on the 2030 Agenda—Ensuring a Better Future for All" (United Nations, 30th June 2017b). The areas identified by this study relate to some of the points highlighted by the SG's progress report, namely (a) gaps and overlaps in support of SDGs (p. 10, para. 51) and (b) partnerships and participation (p. 9, para. 43).

C-Early insights in addressing gaps and overlaps in support of the SDGs (p. 10)

51. The data also showed significant gaps in thematic coverage of SDGs, in terms of expenditures and per-

> sonnel. This was particularly evident in looking at "new" Goals, relating to economic and environmental dimensions of sustainable development, including water and sanitation (SDG 6), energy (SDG 7), and the environment (goals 13-15), sustainable consumption and production (SDG 12) and industry and infrastructure (SDG 9) (p. 11)

The implementation of the SDGs could benefit from these additional outcome documents in terms of their technical specificities and policy recommendations. They also serve as common reference points to review and examine the experiences and projects that contribute to the implementation process. Agenda 21 and the other five international agreements pertaining to Sustainable Development complement the 2030 Agenda by providing specific case examples and guidance as to the "know-what", "know-why" and "know-how".

This set of documents could also be used to strengthen the implementation of the SDGs as identified by the UN Secretary General in point 43 below of the same Repositioning paper regarding partnerships and participation:

> 43. As partnerships increasingly claim space in planning processes from global to country levels, the UN development system must be ready to support national demands for inclusive alliances and participatory planning processes that take account of the needs of the most vulnerable and excluded. As citizens and others helped shape the 2030 Agenda, so too should they shape its implementation. Failure to be inclusive in shaping our common future will only heighten anxieties, create tensions and cloud the possibilities for high impact collaborative action and results. (p. 9)

The documents analysed and compared with the 2030 Agenda offer plenty of detailed advice for national governments when implementing the 2030 Agenda. Agenda 21 is of particular value in this regard. Gap 4 text segments identified in other outcome documents could be collected and used to formulate both a guidance document with toolboxes and checklists and also be turned into learning tools to help government officials responsible for SDG implementation and for public awareness and SD education. Citizens need to be mobilized and engaged in everyday actions that support realisation of a sustainable world where nobody is left behind.

In essence, the proposed guidance document and toolbox would help create an alternative form of knowledge management. They would safeguard the institutional memory of the work contributed by generations of policymakers, researchers, business communities, international civil servants, and other stakeholders. With 13 years left to keep the climate warming to under additional 2 centigrade, there is no room for reinventing the wheel but to build on what has been known and stimulate genuine innovations and advancements in science, technology and social institutions.

Specific suggestions were made in this report to strengthen the Tier III indicators to include important text of outcome document that have not been adequately incorporated into the 2030 Agenda document. Such integration can be made possible by incorporating suggested measurements and methodologies and by augmenting where indicators are either weak or unsubstantial.

In closing, the author of this study would like to reiterate that the additional outcome documents are evidence of excellent work that has been generated over the last 25 years. A lot of information available in these additional outcome documents provides ready-made advice for comprehensive implementation of the SDGs at the national, subnational, regional and global level. Gaps mapped by this comparative analysis offer a starting point to garner the collective learning of the past 25 years.

To integrate the identified gaps into a guidance document could be justified as the knowledge, policy recommendations and the technical know-how are presently scattered in six outcome documents and hard to trace. Such a synthesis document listing the main gaps and giving the texts of the other documents that are not included in the 2030 Agenda could provide a useful source of guidance and knowledge for the countries when implementing the SDGs.

A guidance toolbox could be developed that would follow-up on this study to make the content of Agenda 21 and other related documents accessible not only to diplomats, but also to policy-makers and implementers as well as other stakeholders. Such a guidance document would hence assess whether the gaps identified by this study are still relevant for countries implementing the SDGs. Some of the persistent issues that affect the sustainability of the global system remain unchanged despite progress made on many other fronts. Challenges such as discrimination and injustice, lack of institutional competencies and capacities, as well as ecological insecurity, have actually worsened due to "business as usual" mentality and entrenched policies and practices. Hence, a realistic revisit of the gaps or "differences" identified by this study could contribute to the drafting of such a suggested guidance document.

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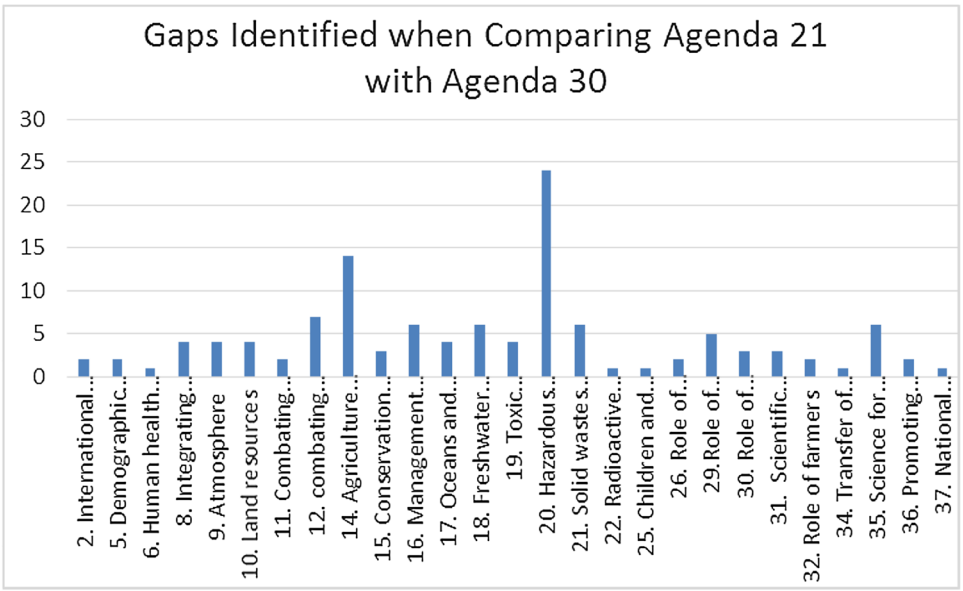
Appendix 1: Summary of gap analysis: Agenda 21 versus the 2030 Agenda

Legend



Themes by chapter	Gaps by frequencies
2. International Cooperation	2
5. Demographic dynamics	2
6. Human health conditions	1
8. Integrating environment and development in decision-making	4
9. Atmosphere	4
10. Land resources	4
11. Combating deforestation	2
12. Combating desertification and drought	7
14. Agriculture and rural development	14
15. Conservation of biological diversity	3
16. Management of biotechnology	6
17. Oceans and coastal areas and development of their living resources	4
18. Freshwater resources	6
19. Toxic chemicals, including prevention of illegal international traffic	4

Themes by chapter	Gaps by frequencies
20. Hazardous wastes, including prevention of illegal international traffic	24
21. Solid wastes and sewage-related issues	6
22. Radioactive wastes	1
25. Children and youth in sustainable development	1
26. Role of indigenous people and their communities	2
29. Role of workers and their trade unions	5
30. Role of business and industry	3
31. Scientific and technological community	3
32. Role of farmers	2
34. Transfer of environmentally sound technology, cooperation and capacity-building	1
35. Science for sustainable development	6
36. Promoting education, public awareness and training	2
37. National mechanisms and international cooperation for capacity-building in developing countries	1

Appendix 2: Summary of gaps by section, chapter, programme areas and objectives as structured in Agenda 21

Agenda 21: Summarized content specifics	GAPS by Frequencies
Section I. Social and Economic Dimensions	
2. International cooperation to accelerate sustainable development in developing countries and related domestic policies	2
B. Making trade and environment mutually supportive	
To clarify the role of GATT, UNCTAD and other international organizations in dealing with trade and environment-related issues, including, where relevant, conciliation procedure and dispute settlement	
D. Encouraging economic policies conducive to sustainable development	
It is necessary to establish, in the light of the country-specific conditions, economic policy reforms that promote the efficient planning and utilization of resources for sustainable development through sound economic and social policies, foster entrepreneurship and the incorporation of social and environmental costs in resource pricing, and remove sources of distortion in the area of trade and investment	
5. Demographic dynamics and sustainability	2
A. Developing and disseminating knowledge concerning the links between demographic trends and factors and sustainable development	
To develop a better understanding of the relationships among demographic dynamics, technology, cultural behaviour, natural resources and life-support systems	
C. Implementing integrated environment and development programmes at the local level, taking into account demographic trends and factors	
Population programmes should be implemented along with natural resource management and development programmes at the local level that will ensure sustainable use of natural resources, improve the quality of life of the people and enhance environmental quality	
6. Protecting and promoting human health conditions	*1*
B. Control of communicable diseases	
By the year 2000, to provide 95 percent of the world's child population with access to appropriate care for acute respiratory infections within the community and at first referral level	
8. Integrating environment and development in decision-making	*4*
C. Making effective use of economic instruments and market and other incentives	
To incorporate environmental costs in the decisions of producers and consumers, to reverse the tendency to treat the environment as a "free good" and to pass these costs on to other parts of society, other countries, or to future generations	
To move more fully towards integration of social and environmental costs into economic activities, so that prices will appropriately reflect the relative scarcity and total value of resources and contribute towards the prevention of environmental degradation	
To include, wherever appropriate, the use of market principles in the framing of economic instruments and policies to pursue sustainable development	
D. Establishing systems for integrated environmental and economic accounting	
The main objective is to expand existing systems of national economic accounts to integrate environmental and social dimensions in the accounting framework, including at least satellite systems of accounts for natural resources in all Member States. The resulting systems of integrated environmental and economic accounting (IEEA) to be established in all Member States at the earliest date should be seen as a complement to, rather than a substitute for, traditional national accounting practices for the foreseeable future. IEEAs would be designed to play an integral part in the national development decision-making process. National accounting agencies should work in close collaboration with national environmental statistics as well as the geographic and natural resource departments. The definition of economically active could be expanded to include people performing productive but unpaid tasks in all countries. This would enable their contribution to be adequately measured and taken into account in decision-making	
Section II. Conservation and Management of Resources for Development	
9. Protection of the atmosphere	*4*
B. Promoting sustainable development	
4. Terrestrial and marine resource development and land use	
…The conservation, sustainable management and enhancement, where appropriate, of all sinks for greenhouse gases	
D. Transboundary atmospheric pollution	
To observe and assess systematically the sources and extent of transboundary air pollution resulting from natural processes and anthropogenic activities	
To encourage the establishment of new and the implementation of existing regional agreements for limiting transboundary air pollution	
To develop strategies aiming at the reduction of emissions causing transboundary air pollution and their effects	
10. Integrated approach to the planning and management of land resources	*4*
To review and develop policies to support the best possible use of land and the sustainable management of land resources, by not later than 1996	
To improve and strengthen planning, management and evaluation systems for land and land resources, by not later than 2000	

Agenda 21: Summarized content specifics	GAPS by Frequencies
To strengthen institutions and coordinating mechanisms for land and land resources, by not later than 1998	
To create mechanisms to facilitate the active involvement and participation of all concerned, particularly communities and people at the local level, in decision-making on land use and management, by not later than 1996	
11. Combating deforestation	*2*
D. Establishing and/or strengthening capacities for the planning, assessment and systematic observations of forests and related programmes, projects and activities, including commercial trade and processes	
To strengthen or establish systems for the assessment and systematic observations of forests and forest lands with a view to assessing the impacts of programmes, projects and activities on the quality and extent of forest resources, land available for afforestation, and land tenure, and to integrate the systems in a continuing process of research and in-depth analysis, while ensuring necessary modifications and improvements for planning and decision-making. Specific emphasis should be given to the participation of rural people in these processes	
To provide economists, planners, decision-makers and local communities with sound and adequate updated information on forests and forest land resources	
12. Managing fragile ecosystems: combating desertification and drought	*7*
C. Developing and strengthening integrated development programmes for the eradication of poverty and promotion of alternative livelihood systems in areas prone to desertification	
To create the capacity of village communities and pastoral groups to take charge of their development and the management of their land resources on a socially equitable and ecologically sound basis	
To provide opportunities for alternative livelihoods as a basis for reducing pressure on land resources while at the same time providing additional sources of income, particularly for rural populations, thereby improving their standard of living	
E. Developing comprehensive drought preparedness and drought-relief schemes, including self-help arrangements, for drought-prone areas and designing programmes to cope with environmental refugees	
To strengthen the flow of early-warning information to decision makers and land users to enable nations to implement strategies for drought intervention	
To develop and integrate drought-relief schemes and means of coping with environmental refugees into national and regional development planning	
F. Encouraging and promoting popular participation and environmental education, focusing on desertification control and management of the effects of drought	
To establish and promote true partnership between government authorities, at both the national and local levels, other executing agencies, non-governmental organizations and land users stricken by drought and desertification, giving land users a responsible role in the planning and execution processes to benefit fully from development projects	
To ensure that the partners understand one another's needs, objectives and points of view by providing a variety of means such as training, public awareness and open dialogue	
To support local communities in their own efforts in combating desertification, and to draw on the knowledge and experience of the populations concerned, ensuring the full participation of women and indigenous populations	
14. Promoting sustainable agriculture and rural development	*14*
B. Ensuring people's participation and promoting human resource development for sustainable agriculture	
To promote greater public awareness of the role of people's participation and people's organizations, especially women's groups, youth, indigenous people, local communities and small farmers, in sustainable agriculture and rural development	
C. Improving farm production and farming systems through diversification of farm and non-farm employment and infrastructure development	
To improve farm productivity in a sustainable manner, as well as to increase diversification, efficiency, food security and rural incomes, while ensuring that risks to the ecosystem are minimized	
To enhance the self-reliance of farmers in developing and improving rural infrastructure, and to facilitate the transfer of environmentally sound technologies for integrated production and farming systems, including indigenous technologies and the sustainable use of biological and ecological processes, including agroforestry, sustainable wildlife conservation and management, aquaculture, inland fisheries and animal husbandry	
To create farm and non-farm employment opportunities, particularly among the poor and those living in marginal areas, taking into account the alternative livelihood proposal inter alia in dryland areas	
D. Land-resource planning, information and education for agriculture	
To establish agricultural planning bodies at national and local levels to decide priorities, channel resources and implement programmes	
H. Conservation and sustainable utilization of animal genetic resources for sustainable agriculture	
To establish and implement development programmes for indigenous breeds to guarantee their survival, avoiding the risk of their being replaced by breed substitution or cross-breeding programmes	

Agenda 21: Summarized content specifics	GAPS by Frequencies
I. Integrated pest management and control in agriculture	
Not later than the year 2000, to improve and implement plant protection and animal health services, including mechanisms to control the distribution and use of pesticides, and to implement the International Code of Conduct on the Distribution and Use of Pesticides	
To improve and implement programmes to put integrated pest-management practices within the reach of farmers through farmer networks, extension services and research institutions	
Not later than the year 1998, to establish operational and interactive networks among farmers, researchers and extension services to promote and develop integrated pest management	
J. Sustainable plant nutrition to increase food production	
Not later than the year 2000, to develop and maintain in all countries the integrated plant nutrition approach, and to optimize the availability of fertilizer and other plant nutrient sources	
To develop and make available national and international know-how to farmers, extension agents, planners and policymakers on environmentally sound new and existing technologies and soil-fertility management strategies for application in promoting sustainable agriculture	
K. Rural energy transition to enhance productivity (5/ The activities of this programme area are related to some of the activities in chapter 9 of Agenda 21 (Protection of the atmosphere))	
Not later than the year 2000, to initiate and encourage a process of environmentally sound energy transition in rural communities, from unsustainable energy sources, to structured and diversified energy sources by making available alternative new and renewable sources of energy	
To increase the energy inputs available for rural household and agro-industrial needs through planning and appropriate technology transfer and development	
To implement self-reliant rural programmes favouring sustainable development of renewable energy sources and improved energy efficiency	
15. Conservation of biological diversity	*3*
Produce regularly updated world reports on biodiversity based on national assessments	
Implement mechanisms for the improvement, generation, development and sustainable use of biotechnology and its safe transfer, particularly to developing countries, taking account the potential contribution of biotechnology to the conservation of biological diversity and the sustainable use of biological resources	
Develop measures and arrangements to implement the rights of countries of origin of genetic resources or countries providing genetic resources, as defined in the Convention on Biological Diversity, particularly developing countries, to benefit from the biotechnological development and the commercial utilization of products derived from such resources	
16. Environmentally sound management of biotechnology	*6*
A. Increasing the availability of food, feed and renewable raw materials	
To reduce the need for volume increases of food, feed and raw materials by improving the nutritional value (composition) of the source crops, animals and micro-organisms, and to reduce post-harvest losses of plant and animal products	
To increase the use of integrated pest, disease and crop management techniques to eliminate overdependence on agrochemicals, thereby encouraging environmentally sustainable agricultural practices	
To expand the applications of biotechnology in forestry, both for increasing yields and more efficient utilization of forest products and for improving afforestation and reforestation techniques. Efforts should be concentrated on species and products that are grown in and are of value particularly for developing countries	
To increase the efficiency of nitrogen fixation and mineral absorption by the symbiosis of higher plants with micro-organisms	
E. Establishing enabling mechanisms for the development and the environmentally sound application of biotechnology	
…Encouraging the exchange of scientists among all countries and discouraging the "brain drain"	
…Recognizing and fostering the traditional methods and knowledge of indigenous peoples and their communities and ensuring the opportunity for their participation in the economic and commercial benefits arising from developments in biotechnology	
17. Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources	*4*
A. Integrated management and sustainable development of coastal and marine areas, including exclusive economic zones	
Promote the development and application of methods, such as national resource and environmental accounting, that reflect changes in value resulting from uses of coastal and marine areas, including pollution, marine erosion, loss of resources and habitat destruction	
B. Marine environmental protection	
Develop economic incentives, where appropriate, to apply clean technologies and other means consistent with the internalization of environmental costs, such as the polluter pays principle, so as to avoid degradation of the marine environment	
C. Sustainable use and conservation of marine living resources of the high seas	
Ensure effective monitoring and enforcement with respect to fishing activities;	
18. Protection of the quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources	*6*

Agenda 21: Summarized content specifics	GAPS by Frequencies
B. Water resources assessment	
To make available to all countries water resources assessment technology that is appropriate to their needs, irrespective of their level of development, including methods for the impact assessment of climate change on freshwaters	
To have sufficient numbers of appropriately qualified and capable staff recruited and retained by water resources assessment agencies and provided with the training and retraining they will need to carry out their responsibilities successfully	
By the year 2000, to have studied in detail the feasibility of installing water resources assessment services	
As a long-term target, to have fully operational services available based upon high-density hydrometric networks	
C. Protection of water resources, water quality and aquatic ecosystems	
To participate, as far as appropriate, in international water-quality monitoring and management programmes such as the Global Water Quality Monitoring Programme (GEMS/WATER), the UNEP Environmentally Sound Management of Inland Waters (EMINWA), the FAO regional inland fishery bodies, and the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)	
E. Water and sustainable urban development	
By the year 2000, to have ensured that 75 percent of solid waste generated in urban areas are collected and recycled or disposed of in an environmentally safe way	
19. Environmentally sound management of toxic chemicals, including prevention of illegal international traffic in toxic and dangerous products	*4*
C. Information exchange on toxic chemicals and chemical risks	
To promote intensified exchange of information on chemical safety, use and emissions among all involved parties	
To achieve by the year 2000, as feasible, full participation in and implementation of the PIC procedure, including possible mandatory applications through legally binding instruments contained in the Amended London Guidelines and in the FAO International Code of Conduct, taking into account the experience gained within the PIC procedure	
F. Prevention of illegal international traffic in toxic and dangerous products	
To reinforce national capacities to detect and halt any illegal attempt to introduce toxic and dangerous products into the territory of any State, in contravention of national legislation and relevant international legal instruments	
To assist all countries, particularly developing countries, in obtaining all appropriate information concerning illegal traffic in toxic and dangerous products	
20. Environmentally sound management of hazardous wastes, including prevention of illegal international traffic in hazardous wastes	*24*
To reduce the generation of hazardous wastes, to the extent feasible, as part of an integrated cleaner production approach	
To optimize the use of materials by utilizing, where practicable and environmentally sound, the residues from production processes	
To enhance knowledge and information on the economics of prevention and management of hazardous wastes	
To achieve those objectives, and thereby reduce the impact and cost of industrial development, countries that can afford to adopt the requisite technologies without detriment to their development should establish policies that include	
…Integration of cleaner production approaches and hazardous waste minimization in all planning, and the adoption of specific goals	
…Promotion of the use of regulatory and market mechanisms	
…Establishment of an intermediate goal for the stabilization of the quantity of hazardous waste generated	
…Establishment of long-term programmes and policies including targets where appropriate for reducing the amount of hazardous waste produced per unit of manufacture	
…Facilitation of the establishment of cost-effective policies and approaches to hazardous waste prevention and management, taking into consideration the state of development of each country	
B. Promoting and strengthening institutional capacities in hazardous waste management	
To adopt appropriate coordinating, legislative and regulatory measures at the national level for the environmentally sound management of hazardous wastes, including the implementation of international and regional conventions	
To establish public awareness and information programmes on hazardous waste issues and to ensure that basic education and training programmes are provided for industry and government workers in all countries	
To establish comprehensive research programmes on hazardous wastes in countries	
To strengthen service industries to enable them to handle hazardous wastes, and to build up international networking	
To develop endogenous capacities in all developing countries to educate and train staff at all levels in environmentally sound hazardous waste handling and monitoring and in environmentally sound management	
To promote human exposure assessment with respect to hazardous waste sites and identify the remedial measures required	

Agenda 21: Summarized content specifics	GAPS by Frequencies
To facilitate the assessment of impacts and risks of hazardous wastes on human health and the environment by establishing appropriate procedures, methodologies, criteria and/or effluent-related guidelines and standards	
To improve knowledge regarding the effects of hazardous wastes on human health and the environment	
To make information available to Governments and to the general public on the effects of hazardous wastes, including infectious wastes, on human health and the environment	
C. Promoting and strengthening international cooperation in the management of transboundary movements of hazardous wastes	
To facilitate and strengthen international cooperation in the environmentally sound management of hazardous wastes, including control and monitoring of transboundary movements of such wastes, including wastes for recovery, using internationally adopted criteria to identify and classify hazardous wastes and to harmonize relevant international legal instruments	
To adopt a ban on or prohibit, as appropriate, the export of hazardous wastes to countries that do not have the capacity to deal with those wastes in an environmentally sound way or that have banned the import of such wastes	
To promote the development of control procedures for the transboundary movement of hazardous wastes destined for recovery operations under the Basel Convention that encourage environmentally and economically sound recycling options	
D. Preventing illegal international traffic in hazardous wastes	
To reinforce national capacities to detect and halt any illegal attempt to introduce hazardous wastes into the territory of any State in contravention of national legislation and relevant international legal instruments	
To assist all countries, particularly developing countries, in obtaining all appropriate information concerning illegal traffic in hazardous wastes	
To cooperate, within the framework of the Basel Convention, in assisting countries that suffer the consequences of illegal traffic	
21. Environmentally sound management of solid wastes and sewage-related issues	*6*
A. Minimizing wastes	
Apply by the year 2000, in all countries, in particular in industrialized countries, programmes to reduce the production of agrochemical wastes, containers and packaging materials, which do not meet hazardous characteristics	
B. Maximizing environmentally sound waste reuse and recycling	
To create a model internal waste reuse and recycling programme for waste streams, including paper, within the United Nations system	
C. Promoting environmentally sound waste disposal and treatment	
By the year 2000, establish waste treatment and disposal quality criteria, objectives and standards based on the nature and assimilative capacity of the receiving environment;	
By the year 2000, establish sufficient capacity to undertake waste-related pollution impact monitoring and conduct regular surveillance, including epidemiological surveillance, where appropriate	
By the year 1995, in industrialized countries, and by the year 2005, in developing countries, ensure that at least 50 percent of all sewage, wastewaters and solid wastes are treated or disposed of in conformity with national or international environmental and health quality guidelines	
By the year 2025, dispose of all sewage, wastewaters and solid wastes in conformity with national or international environmental quality guidelines	
22. Safe and environmentally sound management of radioactive wastes	*1*
A. Promoting the safe and environmentally sound management of radioactive wastes	
The objective of this programme area is to ensure that radioactive wastes are safely managed, transported, stored and disposed of, with a view to protecting human health and the environment, within a wider framework of an interactive and integrated approach to radioactive waste management and safety	
Section III. Strengthening the Role of Major Groups	
25. Children and youth in sustainable development	*1*
A. Advancing the role of youth and actively involving them in the protection of the environment and the promotion of economic and social development	
Each country and the United Nations should support the promotion and creation of mechanisms to involve youth representation in all United Nations processes to influence those processes	
26. Recognizing and strengthening the role of indigenous people and their communities	*2*
Establishment, where appropriate, of arrangements to strengthen the active participation of indigenous people and their communities in the national formulation of policies, laws and programmes relating to resource management and other development processes that may affect them, and their initiation of proposals for such policies and programmes	
Involvement of indigenous people and their communities at the national and local levels in resource management and conservation strategies and other relevant programmes established to support and review sustainable development strategies, such as those suggested in other programme areas of Agenda 21	
29. Strengthening the role of workers and their trade unions	*5*

Agenda 21: Summarized content specifics	GAPS by Frequencies
The overall objective is poverty alleviation and full and sustainable employment, which contribute to safe, clean and healthy environments - the working environment, the community and the physical environment. Workers should be full participants in the implementation and evaluation of activities related to Agenda 21	
…To promote ratification of relevant conventions of ILO and the enactment of legislation in support of those conventions	
…To establish bipartite and tripartite mechanisms on safety, health and sustainable development	
…To increase the number of environmental collective agreements aimed at achieving sustainable development	
…To increase the provision of workers' education, training and retraining, particularly in the area of occupational health and safety and environment	
30. Strengthening the role of business and industry	*3*
A. Promoting cleaner production	
Governments, business and industry, including transnational corporations, should aim to increase the efficiency of resource utilization, including increasing the reuse and recycling of residues, and to reduce the quantity of waste discharge per unit of economic output	
B. Promoting responsible entrepreneurship	
To encourage the concept of stewardship in the management and utilization of natural resources by entrepreneurs	
To increase the number of entrepreneurs engaged in enterprises that subscribe to and implement sustainable development policies	
31. Scientific and technological community	*3*
A. Improving communication and cooperation among the scientific and technological community, decision-makers and the public	
To extend and open up the decision-making process and broaden the range of developmental and environmental issues where cooperation at all levels between the scientific and technological community and decision makers can take place;	
To improve the exchange of knowledge and concerns between the scientific and technological community and the general public to enable policies and programmes to be better formulated, understood and supported	
B. Promoting codes of practice and guidelines related to science and technology	
The objective should be to develop, improve and promote international acceptance of codes of practice and guidelines relating to science and technology in which the integrity of life-support systems is comprehensively accounted for and where the important role of science and technology in reconciling the needs of environment and development is accepted. To be effective in the decision-making process, such principles, codes of practice and guidelines must not only be agreed upon by the scientific and technological community, but also recognized by the society as a whole	
32. Strengthening the role of farmers	*2*
To encourage a decentralized decision-making process through the creation and strengthening of local and village organizations that would delegate power and responsibility to primary users of natural resources;	
To enhance the participation of farmers, men and women, in the design and implementation of policies directed towards these ends, through their representative organizations	
Section IV. Means of Implementation	
34. Transfer of environmentally sound technology, cooperation and capacity-building	*1*
…To promote long-term technological partnerships between holders of environmentally sound technologies and potential users	
35. Science for sustainable development	*6*
A. Strengthening the scientific basis for sustainable management	
Environmental and developmental policy formulation, building upon the best scientific knowledge and assessments, and taking into account the need to enhance international cooperation and the relative uncertainties of the various processes and options involved	
Participation of people in setting priorities and in decision-making relating to sustainable development.	
B. Enhancing scientific understanding	
One key objective is to improve and increase the fundamental understanding of the linkages between human and natural environmental systems and improve the analytical and predictive tools required to better understand the environmental impacts of development options by:	
Carrying out research programmes in order better to understand the carrying capacity of the Earth as conditioned by its natural systems, such as the biogeochemical cycles, the atmosphere/hydrosphere/lithosphere/cryosphere system, the biosphere and biodiversity, the agro-ecosystem and other terrestrial and aquatic ecosystems;	
Integrating physical, economic and social sciences in order better to understand the impacts of economic and social behaviour on the environment and of environmental degradation on local and global economies	
D. Building up scientific capacity and capability	
Reducing significantly the exodus of scientists from developing countries and encouraging those who have left to return	
36. Promoting education, public awareness and training	*2*
C. Promoting training	
To establish or strengthen vocational training programmes that meet the needs of environment and development with ensured access to training opportunities, regardless of social status, age, gender, race or religion	

Agenda 21: Summarized content specifics	GAPS by Frequencies
To promote a flexible and adaptable workforce of various ages equipped to meet growing environment and development problems and changes arising from the transition to a sustainable society	
37. National mechanisms and international cooperation for capacity-building in developing countries	*1*
Shifting time horizons in programme planning and implementation for the development and strengthening of institutional structures to permit an enhancement of their ability to respond to new longer-term challenges rather than concentrating only on immediate problems;	

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