

## **Draft Nexus Message on Water- Energy-Food -Climate through an Urban Lens**

### **Building Integrated Approaches into Implementing the Sustainable Development Goals**

Multiple stakeholders representing governments, intergovernmental organizations, academic institutions, companies, environmental and development organizations and other stakeholders met at an internationally supported conference at the University of North Carolina at Chapel Hill, from April 16-18<sup>th</sup> 2018 to explore how addressing interlinkages and an intersectoral approach can help implement the 2030 Agenda on Sustainable Development incorporating the Sustainable Development Goals.

From the time the Sustainable Development Goals were adopted in 2015 it was generally recognized that they will only be successfully achieved if they are pursued in an integrated way, and that the totality of interconnections or nexuses between the different goals or targets needs to be thoroughly analyzed and understood to build coherent sets of integrated policies and action programmes for sustainable development.

Within this complex set of connections some interconnectivities are however stronger than others and deserve particular attention in order to achieve more sustainable outcomes. The Nexus community of researchers and policy makers has for the past few years focused on the connections between the Water, Food, Energy and Climate Goals and developed important insights and practical approaches for achieving better, more integrated, and therefore more sustainable results in and between those sectors.

The 2018 Conference is the second Nexus Conference that has been organized by the Water Institute of the University of North Carolina. This year's Conference again had a particular focus of looking at the interconnections and nexus between the Water, Food, Climate and Energy Goals, but this time added the dimension of looking at these connections through an Urban Lens.

The Conference also took the opportunity to take stock of the evolution of Nexus-style thinking and the state of its application on the ground in developing practical integrated solutions in many places and at many levels. The Conference felt that the time would now be right to seek to extend the Nexus-style of analysis and action-oriented policy frameworks to other important linkages in the SDG framework.

The following Nexus Message based on research, contributions and discussions associated with the Nexus 2018 event [was adopted unanimously by the participants] and is offered by them as a contribution to discussions at this year's HLPF and other SDG implementation processes.

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Nexus 2018 Conference Co-directors

## Message from the 2018 Nexus Conference

The 2030 Agenda and the Sustainable Development Goals can only be achieved if they are pursued in an integrated manner. For this reason, the Nexus community of researchers, academics, NGOs, policy makers, the private sector and other key stakeholders came together at the 2018 Nexus Conference at the University of North Carolina at Chapel Hill.

We have concluded that the Nexus approach remains essential in recognizing the indivisible nature of the SDGs and that such an approach is fundamental in delivering these goals. The Nexus approach brings into focus the positive synergies and potential negative tradeoffs that arise when working to achieve the ambitious 2030 Agenda, and it is helping to develop more practical solutions to address key issues. Understanding the interlinkages between water, energy, food and climate plays a crucial role in delivering sustainable outcome and helping global communities' in their collective efforts to deliver the SDGs, end poverty, and create more equitable and peaceful societies.

One of the most prominent debates at the conference revolved around unpacking the notion of exactly what integrated approaches actually comprise of. The outcome of that debate is that integration involves 3 concepts; optimization, synergies and tradeoffs. Further, that on the ground, consideration of the Nexus of Resources (water, soil, wind, sun, minerals, waste etc.) is not useful unless it is linked to the Nexus of Services (energy, food, housing, supply etc.). In development practices, it was observed that the linking and integrating element for optimizing, synergizing and making tradeoffs, is infrastructure. Since the Nexus approach focuses on optimizing positive synergies while minimizing negative tradeoffs, it is being put forward as the most effective mean to develop more practical solutions to key issues.

The Nexus community is dedicating its work to implementing the 2030 Agenda in an integrated way as an essential path forward for securing a sustainable future. The conference demonstrated that there is a positive energy among the Nexus community who sees the sustainability challenges as opportunities to increase knowledge, research, and community building. In earlier years, the Nexus community focused particularly on the connections between water, food, energy and climate and helped to pioneer and foster ways of delivering more sustainable outcomes in these sectors. This year, the 2018 Nexus Conference extended its focused to capture these connections through an urban lens.

**The Rural-Urban Nexus:** *We recommend the Nexus approach to policy makers and everyone concerned with the sustainable management of cities and their relationships with rural areas and broader ecological processes.*

A steadily growing percentage of the world's population is living in cities and towns. Finding better ways to manage urban living is an important part of the 2030 Agenda and addressing climate change.

Cities are to be seen not in isolation, but intrinsically connected with broader ecosystem as part of a metabolism of flows and interconnected social and ecological processes. A substantial proportion of the water, energy and food that supports urban living is supplied from rural areas outside the cities. The largely one-way flow of these resources together with the pollution and waste generated in urban spaces have a determining effect on patterns of rural development and the integrity of the ecosystems services. The Nexus approach has already shown itself to have a crucial part to play in ensuring that the supply of water, energy and food services to cities is managed in ways that optimize and balance the needs of both urban and rural communities in a just, equitable and sustainable way.

In addition, if planetary boundaries were not going to be exceeded, then 100% of GDP growth in future will have to come from productivity growth, most of which will take place in the urban setting. It was

argued therefore, that the future urban nexus or New Urban Agenda must be about reintegrating systems, services, silo's and social behaviors. The consideration of the Water, Energy, Food, and Climate Nexus in the context of the need to re-integrate urban and rural service silos in our development planning and governance models also enhanced the understanding of connections among other issue related to the SDGs.

**Cross-cutting issues for the Nexus approach:** *We urge all those concerned with the advancement of sustainability to consider adopting a Nexus-style of analysis and action to identify the strongest interconnections between various goals and targets in related areas and to generate integrated approaches and policies for them.*

The Nexus approach has already demonstrated its practical utility in assisting analysis and delivering sustainable solutions. This year's successful conference showcased that the Nexus community is growing in numbers, in depth of analysis and in influence. We maintained that the main focus of the Nexus is Water, Energy, Food, and Climate, however, we believe that the time has come to apply the approach more widely as it can help to enhance the understanding of connections among other issue such as health, gender, human mobility, population growth and other matters pertaining to the 2030 Agenda.

**Governance:** *We recommend that the governance dimension should from the outset be factored into any new Nexus analyses and policy recommendations that emerge.*

We recognized the key role that governance structures and processes play when addressing Nexus issues and the SDGs. Implementation of the Agenda necessitates the creation of appropriate mechanisms to facilitate coordination among various levels of government.

Good governance includes: strengthening interconnections between those responsible for different sectors and the delivery of various SDGs so as to increase the amount of information and tools share across different silos while maintaining their disciplinary value; building co-operative relationships between different levels of government; engaging all relevant stakeholders in effective multi-stakeholder processes for delivering the SDGs; ensuring that the private sector is incentivized; enhancing the contribution of public private partnerships through clear guidance and rules, and mobilizing the public in active support of the sustainability transformation. Throughout the conference we identified a variety of cases in which such practices are already taking place.

**Finance:** *We recommend Nexus-style analysis be built into public and private financial appraisal systems to ensure that investments support key integration objectives and appropriate co-operation between different levels of governance, and between the public and private sectors.*

Finance and investment – be it public or private – are crucial factors in shaping future development. It is essential that those responsible for directing those flows do so in a way that supports Nexus integration objectives, and abjures unsustainable investments assessed on old-fashioned narrow terms and based on short-term economic criteria. Financial incentives at national and global levels should examine innovative methods to better calibrate incentives to accelerate progress and to measure corporate contribution to the SDGs.

Innovative forms of financing means that it is necessary to bridge the gap between short-term and long-term investment, macro and micro economics, and global and local financing. Other innovative examples advocated by the Nexus community include mandatory sustainability reporting in Stock Exchanges and expanding the base of analysis used by credit rating agencies to include in their rating system the SDGs were cited as opportunities to effect change at a systemic level.

Sustainable finance should as well have at its heart new ways of measuring Return on Investment. We invite to broaden the measurement of this and other financial or economic indicators such as GDP to include not only to economic analysis, but also social and environmental.

Finally, we want to recognize the importance of providing finance and support to the developing world to deliver the SDGs, and to consider the impact that unsustainable financing can have on least develop countries. As well we encourage further investment and financing of Nexus related research and tools aimed at delivering the SDGs.

**Linking Nexus analysis to Policies Formulation:** *We recommend enhanced promotion of research and analysis on Nexus interlinkages between different subject areas, and linkages between such work and the policy-making community.*

The conference demonstrated that there is a growing body of research and modelling efforts lead by the public, private and academic sector among others, that explore the Nexus between the different development challenges. Such research can provide important insights and pathways to implement innovative solutions, and be a powerful policy tools for governments at all levels. A critical challenge is to agree common language among researchers to better articulate their findings to both policymakers, the private sector and other stakeholders.

In addition, we recognized that it is essential that practical and traditional knowledge is considered as valuable to understand the Nexus interlinkages and provide insight for delivering the SDGs.

**Capacity Building:** *We recommend using a Nexus thinking when implementing capacity building for SDGs delivering as such approach can strengthen understanding regarding the various development goals, and thus equipped communities with tools to better address these challenges.*

Building the capacity of people, institutions, organizations, and both the public and private sector is essential to delivering the SGDs. A Nexus-style thinking can contribute to forming stronger understandings of the interconnection between development challenges, and therefore can help to deliver better solutions.

Capacity building can help increase social and human capital and created the necessary energy to encourage the new generation of practitioners to engage with the issue presented in Agenda 2030 in an integrated way. The Nexus conference demonstrated that such new generation is emerging, however, it is necessary that they are supported as so to further develop their skills and provide them with the resource to increase their engagement.

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## **Fostering Holistic Approaches into implementing the Sustainable Development Goals**

A Nexus Message from the Co-directors of the Nexus 2018: Water, Food, Climate and Energy through an Urban Lens Conference

at the University of North Carolina at Chapel Hill, April 16-18, 2018

### **1. INTRODUCTION**

In 2015 Heads of State agreed on the 2030 Agenda and subsequently adopted 17 Sustainable Development Goals (SDGs) accompanied by 169 associated Targets, as a universal call to action to address some of the key challenges society will have to face up to 2030. Also, 230 Indicators were agreed upon so as to help monitor the implementation of the 17 Goals and Targets.

As the successor to the Millennium Development Goals, the SDGs not only address development, but sustainable development and other areas such as climate change, innovation, sustainable consumption among other priorities that have been included. The Goals not only tackle the symptoms, but also the root causes of the problems that humanity faces. These Goals are universal and indivisible by their very nature; they can only be achieved if their interdependent nature is understood, and thus it is necessary to focus on the interlinkages between the different Goals.

The Sustainable Development Goals recognize that the world is a single complex system in which all the parts and subsystems constantly interact. Global problems such as persistent poverty and climate change should be viewed from this perspective and thus, solutions and policy interventions should consider the synergies, and trade-offs within the system.

A Nexus approach considers that water, energy, food and climate are inextricably linked and actions in one area more often than not have an impact on another. Therefore, the Nexus can provide a mean to address the various SDGs as it can provide practical utility in assisting analysis and delivering sustainable solutions. In earlier years, the Nexus community focused particularly on the connections between water, food, energy and climate and helped to pioneer and foster ways of delivering more sustainable outcomes in these sectors. Nevertheless, the time has come to apply the approach more widely as it can help to enhance the understanding of connections among other issue such as health, gender, human mobility, population growth and other matters pertaining to the 2030 Agenda. This year, the 2018 Nexus Conference extended its focused to capture these connections through an Urban Lens.

Addressing the Nexus is a way to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure that humanity operates within planetary boundaries as to promote lasting protection of the planet and its natural resources, ultimately safeguarding human health and well-being for generations to come.

The Nexus embraces a circular economy which contrary to the traditional model of extraction-use-dispose, it is an economic model that encourages environmental sustainability and attempts to generate as little environmental impact by keeping resource in use for as long as possible. Moreover, the Nexus supports the move towards low carbon economies- economies that use low carbon power and therefore have minimal Green House Gas (GHG) emission.

The key challenge of the 'Nexus' will be identifying policies and programmatic interventions along this approach, designing processes that mirror the systems in which we live and the systems we seek to build. In this context, the Nexus seeks to create a platforms and opportunities for identifying

context-specific development solutions to these issues. Innovative development interventions that bring multiple stakeholders and actors together to address the multi-pronged challenges is essential for the implementation of the SDGs. For example, the efforts towards creating national and global SDG platforms provide one such avenue for multi-stakeholder and multi-sectoral exchange to foster sustainable development.

During the 2018 Nexus Conference different stakeholders ranging from government officials, intergovernmental organizations, and NGOs, to the private sector and academia among others, gathered to share their knowledge with the hope of providing insights and identifying challenges that should be address in the 2018 High-Level Political Forum. The conference demonstrated that there is a growing body of research and modelling efforts that explore the Nexus between the different development challenges. Such research can provide important pathways to implement innovative solutions for the SDGs, and be a powerful policy tools for governments at all levels.

In June 2018 Member States will start negotiating the Ministerial Declaration for the UN High Level Political Forum (HLPF) annual review. The 2018 theme of the HLPF is “**Transformation towards sustainable and resilient societies**”. Goal 2, although not under review, have also been included as we considered that it is essential to the Nexus, and to the achievement of sustainable and resilient societies. The set of Goals and Targets under review, all of which are relevant to the Nexus, include:

[GOAL 2](#): End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

[GOAL 6](#): Ensure availability and sustainable management of water and sanitation for all.

[GOAL 7](#): Ensure access to affordable, reliable, sustainable and modern energy for all.

[GOAL 11](#): Make cities and human settlements inclusive, safe, resilient and sustainable.

[GOAL 12](#): Ensure sustainable consumption and production patterns.

[GOAL15](#): Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

[GOAL 17](#): Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

Guiding the 2030 Agenda and the Sustainable Development Goals are a set of critical principles that also guide our work on the Nexus. These are the purpose and principles of the Charter of the United Nation, the Universal Declaration of Human Rights. Other international agreements on human rights such as the Paris Agreement on Climate Change, the Addis Ababa Action Agenda, the New Urban Agenda and the Sendai Framework for Disaster Relief also need to be considered when considering the Nexus.

The Conference identified several challenges that should be addressed in this year’s High Level Political Forum’s Ministerial Declaration:

## **2. HIGHLIGHTING CHALLENGES TO DELIVERING THE SDGS BEING REVIEWED IN 2018**

### *2.1 Goal 6: Ensure availability and sustainable management of water and sanitation for all*

Water is a limited natural resource that needs to be managed for the benefit of the community, city, state and region. The World Health Organization estimates total global economic losses due to inadequate water supply and sanitation services at USD \$260 billion a year. Equitable approaches to water management and urban design should be part of any response to climate change and of all efforts to

achieve sustainable development. This can be done through embracing a circular economy through effective infrastructure planning and strategic land use in regions and investment in water, sanitation and hygiene. Fostering a holistic approach to water use and renewable energy can help reduce their consumption, and decrease waste and GHG emissions what in turn contributes to delivering more efficient and sustainable cities and regions. What is more, expanding access to energy, water, and land resources contributes to reducing poverty and achieving food security, with interrelated economic and environmental benefits.

Within the ongoing discussion of a circular economy, this conference explored the role of tradeoffs in enhancing resilience along the continuum of Water-Energy-Food and Climate Nexus. This would entail acknowledging that changes such as climate change can be seen as prime movers of migration which as well have health impacts and which in turn impact urbanization, thus affecting water, energy and food demand.

### *2.2 Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all*

To deliver the goal of the Paris Agreements of keeping the rising global temperatures below 2 degrees Celsius it is critical to move to a low carbon and circular economy in the next 15 years.

All types of energy generation consume water either through their process of accessing the raw materials or maintaining the power plants that generate the electricity. The move towards renewable energy not only contribute to climate change mitigation, but also in most cases, renewable energies can reduce the use of water (biofuels excluded). Therefore, it is essential to recognize sustainable and renewable use of energy as key for mitigating climatic risks and overconsumption of water resources. Key renewable energy sources such as solar and wind are very low in their use of water.

Energy has acted historically as a driver of development and the lack of sustainable energy is a possible security concern in the future.

### *2.3 Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable*

Since for the first time in human history most people reside in cities and towns, and these places require considerable amount of resource to be maintained, they are a crucial focal point for delivering the SDGs. Most of the 169 SDGs targets can only be achieved through sustainable innovation by local communities and local actors including local authorities. The localization of the SDGs needs to become a priority and the role of cities in implementing the SDGs needs to be further recognized.

Urban areas are at the front of the challenges presented by climate change as they consume 78% of the world's energy and produce 80% of the world's GHG emissions. Currently, cities are caught in an unsustainable linear flow of energy which is embedded in linear economy. However, as cities represent the planet's economic centers – they account for 75% of global GDP and their populations and economies keep expanding, and they also present an opportunity to foster and implement sustainable development, encourage circular economies and impact change in a broader sense.

Key to building sustainable cities and communities is the need to safeguard good health for all. As cities grow in importance on the global scale so will the need to construct urban environments that are not only sustainable, but ensures the health and wellbeing of its inhabitants. A focus on the Nexus with health will result in reduced health burdens and healthcare costs, and achieve universal health care.

Urban areas need to be considered as part of their broader territorial landscape and climate, thus facilitating better incorporation of the broader ecological process of their respective region. This interlinkage between rural and urban areas as well as within the region at large needs to be addressed through a Nexus approach.

Urban areas need to develop resilience policies that take account of the Nexus while developing capacities to absorb future shocks and stresses to their social, economic and technical systems and infrastructures. Furthermore, policies should include disaster and climate risks concerns as these increasingly pose fundamental threats to cities and urban settlements. With cities emerging as engines of development, this is likely to have far more momentous impacts than envisaged.

The ability to address the different interlinkages will be critical to the success of any resilience strategies. There needs to be a serious dialogue on the enabling environments that cities need, including the role that local and subnational government play in intergovernmental bodies, and the willingness of U.N. member states to create them. Only then, will it be possible to roll-out far-reaching initiatives to achieve the ambitious 2030 Agenda.

#### *2.4 Goal 12: Ensure sustainable consumption and production patterns*

One of the critical challenges is that of the lacking consumer information and awareness on transitioning to more sustainable consumption and production patterns. Consumers all over the world are demanding a greater ethical and sustainable focus from their products, yet information remains inaccessible and confusing in many cases. Regulation and incentives must come from governments, ensuring companies complying to deliver clear, accessible information on the impact the manufacturing and transporting of products have on the planet.

National, sub-national and local governments should create strong platforms for addressing sustainable consumption and production that integrates sector plans into a coherent plan that deals with necessary tradeoffs between the different Nexus elements. This would be achieved through procurement policies that promote resource efficiency and reduce negative environmental impacts, as well as helping to accelerate sustainable business practice through targeted regulation. City dwellers, on average, consume much larger shares of the world's resources than rural dwellers. Ensuring that consumption levels of the rich parts of society are reduced to sustainable levels while increasing access to affordable food and other essential resources to poorer urban populations will be essential to meet the SDGs.

In addition, sustainable production also includes the sustainable use of productive assets such as working animals whose contribution can be both more sustainable and more productive by the implementation of simple welfare and animal protection measures.

#### *2.5 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*

Ecosystem and land degradation are both causes and effects of poverty and food insecurity. Poor communities lack resources to cope with the causes of land degradation caused by climate change, and over-exploitation of land and water for short-term gains. This is further exacerbated by lack of education around successful land management practices, reinforcing a negative feedback loop by leading to further land degradation and food insecurity.

An ecosystems and landscapes approach to the interlinkages between the relevant SDGs and SDG15 enables a better understanding and inclusion of the true valuation of nature when policy is being made. Ecosystems, land and proper care for working animals provide the foundation for sustainable agriculture and development addressing water security, energy provision and good health. Initiative such as “4/1000 Initiative: Soils for Food Security and Climate” launched at in Paris at the Climate COP21 among others, demonstrate that agriculture, and in particular agricultural soils can play a crucial role in fighting food insecurity and climate change.

The United Nations Convention to Combat Desertification (UNCCD) will focus on target 15.3 on Land Degradation Neutrality. Currently 115 countries have committed to set LDN targets to better conserve and manage land and rehabilitate degraded terrestrial ecosystems. The SDG target of Land Degradation Neutrality is now a critical objective for UNCCD in its strategic framework for national implementation to 2030.

There are 23 SDG Targets that fall in 2020 or 2025. This includes one in SDG 6, one in SDG 11, one in SDG 12 and five in SDG 15. This requires a coherent approach by Member States on how these might be reviewed. There is a danger that without a coherent approach to all these targets there may be two classes of targets, some being among the SDGs and others outside. This year the Convention on Biological Diversity will start the process to set new 2030 targets as will the SAICM process for the SDG 12 target. These will not be SDG targets.

### **3. STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT**

#### *3.1 Policy coherence*

Policy coherence between levels (e.g. national to subnational to local) and among agencies (e.g. water and agriculture ministries) of government is important to facilitate the implementation of the SDGs and address the challenges they present. Approaches that could be considered include: mandatory multi-agency task forces or collaborative work groups focused on Sustainable Development policy coherence; national and subnational government participation in and/or convening of subnational, watershed, or integrated landscape management platforms; outcome-based rather than prescriptive-practice regulatory policies that facilitate coherence.

The UNDP's MAPS (Mainstreaming, Acceleration and Policy Support) approach can also help countries to develop coherent policies for the implementation of the SDGs. MAPS seek to support countries with not only linking the SDGs agenda to national, sub-national and sectoral levels, but also helps to identify the key "accelerators" along a suite of catalytic interventions designed to yield multiple dividends across goals and targets.

#### *3.2 Governance structures and processes at the Regional, National, Subnational and local level as well as multi-level governance approaches. Governance is crucial when addressing the individual SDGs and their interlinkages.*

At the Regional level the UN Regional Commissions and Regional Multilateral Agreements secretariats need to be strengthened to address transboundary Nexus related issues. This will be essential in addressing issues such as water, energy, food and climate as they are not restricted to national boundaries, but rather they often pertain to a global ecological systems processes. Thus, the actions or inactions of one nation can impact other nations capacity for sustainable development. For this reason, a Nexus approach can provide insight to instigate cooperation among nations and regions that will be crucial in addressing the SDGs.

Implementation of the Agenda necessitates the creation of appropriate mechanisms to facilitate coordination among various levels of government and thus requires a multilevel perspective. The international community, States, nations, local government and stakeholders all should work together in order to identify and address development challenges at the appropriate level.

Parliaments can use their parliamentary committee structures to work together to ensure coherence. Meetings of different parliamentary committees together should be explored as a way of

ensuring that they are addressing Nexus related issues. Countries organized under other systems of government should find ways in which their current structures could facilitate cross-departmental communication so as to increase the amount of information and tools share across different silos while maintaining their disciplinary value, and building co-operative relationships between different levels of government.

At all levels of government there are key ways that could enable more integrated approaches. These could include:

- A cross-departmental committee under the Prime Minister/Governor/Mayor, regularly convened together with a multi-stakeholder commission / board. Such committee could allow for the sharing of information across different governmental department and different scales of government.
- An integrated SDG strategy should be produced by government, which would then have an annual or biennial SDG Report which could then reflect implementation of other relevant agreements such as the Convention on biological Diversity, the Framework Convention on Climate Change, any poverty reduction strategies, and highlight the most important interlinkages.
- In accordance with the Nexus approach, all stakeholders should be consulted and be part of the decision making and implementation processes. Governments can support such initiative by establishing a national Multi-Stakeholder Commissions on the SDGs where they do not already exist. This will also help address power differences between stakeholder groups and provide a platform for stakeholders to engage. Such Commissions need to be set up with great consideration and extensive consultation among government departments and stakeholders. They need to be serviced by functioning Secretariats and resources, including access to knowledge and science as needed. They will benefit from external, professional process design and facilitation to maximize the benefits of dialogue and cooperation.

### *3.3 Science-policy interface*

The scientific community must undertake and deliver interdisciplinary and trans-disciplinary research that identifies new policy approaches and grounds them in robust science and, local and traditional knowledge. Such approach should help defined what is and is not a cross-cutting issue, and provide policy makers and stakeholders with evidence and tools that match their needs for informed decision-making.

Member States should look at how they can encourage Universities and Colleges to reward working in an inter- and trans-disciplinary way and report progress to the HLPF in their voluntary national reports. International and national scientific and professional associations, and the education system should create rewards, create funding programmes, and build capacities to address an inter-trans-disciplinary approach.

Member States should encourage and create the appropriate institutional structures that will allow for the ease and uptake of knowledge of the scientific community and local and traditional knowledge. Such structures should be of the appropriate scale and be certifiably recognized to be the interface for the nexus on science and policy. In addition, critical challenge is to agree common language among researchers to better articulate their findings to both policymakers, the private sector and other stakeholders.

### *3.4 Nexus Partnerships*

The implementation of the SDGs will include multiple delivery mechanisms. Governments, intergovernmental institutions, and individual stakeholders all have specific actions to take. Collaboration among actors will also be key, as agreed in Goal 17.

- A. Nexus ***Multi-Stakeholder Partnerships*** can play a role in delivering the SDGs and their Targets, particularly when governments, stakeholders, or sectors cannot create a solution to a challenge on their own or implement necessary changes by themselves. These partnerships should be based on guidelines and principles agreed by the UN General Assembly – including transparency, inclusiveness, equity, and accountability. Partnerships should neither replace action that should be undertaken by governments, nor should they take resources away from governments which might negatively impact their ability to do their work.
- B. Nexus ***Public Private Partnerships*** (PPPs), can also contribute in delivering the SDGs when companies or others are contracted to deliver certain services for public benefit. There is some controversy around the use of PPPs. We believe that the UN General Assembly should adopt a set of clear principle and guidelines for SDG related PPPs, learning from past failures and successes and guided by the principles identified in the Addis Ababa Action Agenda for PPPs. The Addis Ababa Action Agreement makes it clear that public-private partnerships (PPPs) should share risks and rewards fairly, include clear accountability mechanisms, and meet social and environmental standards.

### *3.5 Technology transfer or sharing*

New technology should be shared through the Technology Facilitation Mechanism and technology banks. These will enhance the ability of governments and stakeholders to address Nexus challenges and trade-offs. The Technology Facilitation Mechanism set out in the Addis Ababa Action Agenda should move beyond its online platform to support actual technology transfers via matchmaking. These matches should be between technology suppliers and technology seekers. In addition, there should also be matches between technology transfer service providers and enterprises.

### *3.6 Capacity Building*

The challenge of addressing the Nexus requires capacity building within intergovernmental organizations, national governments, sub-national governments, local governments, and stakeholders. These actors should have their capacity enhanced; this can be achieved through training, toolkits, and sharing of good practice on the Nexus.

The building of technical expertise is necessary since currently there is not sufficient training for integrated management to address nexus issues. Systems and process thinking, communication across sectoral and cultural differences, and collaborative leadership are critical skills for managers that must be taught regardless of discipline.

Capacity building can help increase social and human capital and created the necessary energy to encourage the new generation of practitioners to engage with the issue presented in Agenda 2030 in an integrated way. The Nexus conference demonstrated that such new generation is emerging, however, it is necessary that they are supported as so to further develop their skills and provide them with the resource to increase their engagement.

### *3.7 Financing the Nexus*

Addressing Nexus issues will require support for the development of integrated financing mechanisms that can accommodate the time-frames and the tradeoffs between the different elements of the Nexus.

Financial incentives at national and global levels should examine innovative methods to better calibrate incentives to accelerate progress, and to measure corporate contribution to the SDGs. Innovative forms of financing means that it is necessary to bridge the gap between short-term and long-term investment, macro and micro economics, and global and local financing. Sustainable finance should as well have at its heart new ways of measuring Return on Investment. We invite to broaden the measurement of this and other financial or economic indicators such as GDP to include not only economic analysis, but also social and environmental.

Member States that have not done so should instruct Stock Exchanges to make it a listing requirement to produce Environment, Social and Governance Reports or explain why not. The Sustainable Stock Exchange Initiative and report progress through its UN members to the yearly Inter-Agency Task Force for Financing Development. Which should then report progress to the UN Finance for Development Forum in 2019, 2023, 2027 and 2030.

The development of the World Benchmarking Alliance to support the ranking of companies in their internalization of the SDGs (particularly around key indicators) is to be welcomed and supported.

We welcome the decision by the Credit Rating Agency Moody's to weigh the impact of climate risks with US states and US municipalities' preparedness and planning for these impacts when they are analyzing credit ratings. Analysts for municipal issuers with higher exposure to climate risks will also focus on current and future mitigation steps and how these steps will impact the issuer's overall profile when assigning ratings. This should be expanded to other countries and other credit rating agencies.

Creating a robust pipeline of integrated investments (cleaner technologies) addressing Nexus issues will require support for social and environmental entrepreneurship as part of the development of sub-national natural resource use planning. Converting action plans into investable deals to unlock the private capital required to achieve the SDGs will need more institutional support and capacity-building than has heretofore been dedicated to this challenge. To support investment the World Bank and International Finance Corporation should consider establishing an Earth Fund which would offer insurance for investment in Least Developed Countries.

Finally, the Nexus Community recognizes the importance of providing finance and support to the developing world to deliver the SDGs, and to consider the impact that unsustainable financing can have on least develop countries. Furthermore, we encourage that investment and financing on delivering the SDGs occurs in a transparent way such as to avoid and fight corruption. We encourage further investment and financing of Nexus related research and tools aimed at delivering the SDGs.

### *3.8 Identifying Nexus indicators that might be useful at the national or sub-national level*

The United Nations Statistical Commission's Interagency and Expert Group on SDGs Indicators (IAEG-SDGs) agreed on 230 Indicators to monitor the implementation of the SDGs. The global indicators represent what Member States can report on at present. National, sub-national and local government as well as stakeholders are encouraged to develop supplementary indicators through a consultation process with their populations. In particular they are encouraged to pilot indicators that address the interlinkages between Goals. It would be essential for the implementation of the SDGs to provide better guidance on how to use these Indicators at local, more contextualized levels.

The World Data Forum in Abu Dhabi in October 2018 offers the chance to develop a dialogue on how to develop better interlinkage indicators over the coming years and to pilot them in preparing for the reviews of the SDG indicators in 2020 and 2024. For instance the GEMI coordinated by UN-Water offer support to countries for the monitoring of SDG 6, including the creation of country base indicators. More initiatives like this for other SDGs should be implemented.

Since the Nexus explicitly focuses on the interlinkages between water, energy, food and climate, it can provide insights and serve as a tool to identify indicators that measure the interlinkages at a local level.

### *3.9 Compiling nexus tools (will be filled out as we collect them)*

Since the first Nexus conference in 2011, there has been experimentation in models on how to address and to map out interlinkages so as to contribute to the prioritization and operationalization of certain issues. In this era of experimentation, it is recognized that the models and frameworks have limitations. These models can provide observations to help recognized the possible trade-offs when addressing Nexus related issues or the SDGs themselves. The Nexus approach thus, brings into focus the positive synergies and potential negative tradeoffs that arise when working to achieve the ambitious 2030 Agenda, and it can help to develop more practical solutions to address key issues.

However, more important than the results of these models are the process of developing and using them as these processes build knowledge and shared understanding, becoming key components of successful governance structures and processes.

Discussing Nexus tools will enable the discussion of interlinkages to become more tangible, allowing the aggregation of information from science and relevant stakeholders to the level of policymaking in a transparent way.

Nexus tools include process tools: methods of stakeholder analysis and process design; relationship and trust building; multi-stakeholder dialogue for integration across issues and sectors; negotiating trade-offs; partnership brokering contracting and implementation; collaborative monitoring, evaluation and learning.

The conference demonstrated that there is a growing body of research and modelling efforts lead by the public, private and academic sector among others, that explores the Nexus between the different development challenges. Such research can provide important insights and pathways to implement innovative solutions, and be a powerful policy tools for governments at all levels. For more information on Nexus tools please see *Appendix 1*.

### *3.10 Education and public awareness for sustainable development*

Providing students with the skills to address cross-disciplinary approaches will be critical to building a society that can address Nexus issues. The education system at all levels should integrate system thinking into curriculums.

Education and public awareness is essential in delivering the SDGs as people requires the knowledge and skills to be able to support the implementation of the Agenda's ambitious Goals. Education is essential to empower communities to move towards sustainability. It is essential that education across the world encourages sustainability and sustainable patterns of consumption. For instance, the Education for Sustainable Development approach empowers people to take informed decisions for environmental, economic and social sustainable development.

The Nexus approach can play a crucial role in fostering a system thinking approach which can provide learners and the public at large with the essential understanding that sustainability challenges are not only to be seen as individual issue, but rather as part of a larger, complex, interconnected system.

### *3.11 Information for implementation and decision making*

The development of two UN Regional Agreements on Access to Information, Public Participation and Decision Making (UNECE, UNECLAC) should inform and support other UN Regional Commissions in the development of similar instruments.

What is more, information for government, stakeholders and individuals should be available to promote informed decision-making. Sustainable development requires that policy makers have access to the best possible available information and data so as to guide their decision and the implementation of their policies. Also, for stakeholders to be engaged in decision making and implementation process is crucial that they have access to the necessary information that would allow them to engage in a meaningful way. Likewise, individuals play a vital role in delivering the SDGs through their everyday behavior and consumer patterns. For this reason, accurate information should be available so individuals as well can make informed decisions to contribute towards sustainable and resilient societies.

Government and private companies are collecting more data than ever and such data should be available to facilitate informed decision making. Open source data and often crowdsourcing can provide valuable information that can in turn inform decision making. Despite the high value of such data, it is as well necessary to recognize the privacy implications that arise from increased data collection and we encourage governments and private industries to maintain privacy rights.

The Nexus Conferences has demonstrated that the tools that the Community has developed can be useful in informing decision making, especially sustainability models can provide insights that could help policy makers to take the appropriate action.

## **4. CONCLUSION: INTEGRATED IMPLEMENTATION OF THE SUSTAINABLE DEVELOPMENT GOALS (to be filled in at the conference)**

An integrated approach is vital to the implementation of the Goals and Targets of the 2030 Agenda and its Sustainable Development Goals. The Nexus can provide insights and serve as a tool for the implementation of such goals. The 2018 Nexus Conference demonstrated and reaffirmed the potential of the Nexus as a means to understand the interlinkages between water, food, energy and climate, and its capacity to be applied more widely as it can help to enhance the understanding of connections among other issues pertaining to the Agenda.

The aim of the 2018 Nexus Conference was to bring together different stakeholders ranging from the international community of researchers, NGOs, policy makers, to the private sector and other major groups to include a variety of perspectives that helped identify various challenges that should be addressed in this year's High Level Political Forum's Ministerial Declaration. Also, the Conference intended to provide insights for implementation of the SDGs and reinforced the importance of global partnerships for sustainable development.

The Nexus approach serves to analyze, design and implement policies in a multi-disciplinary, systems-based and integrated manner, and thus can be an effective tool in implementing the Agenda 2030. Throughout the Conference the Nexus Community tried to unpack the notion of how exactly integrated approaches look like and it did so by presenting the Nexus approach in action. The Nexus approach focuses on optimizing positive synergies while minimizing negative tradeoffs, and it is thus an effective means to develop more practical solutions to address key issues.

The Conference showed that there is a growing body of research and modelling efforts led by the public, private and academic sector among others, that explore the Nexus between the different development challenges and indeed such research and modeling can serve as a tool to address the SDGs.

This year the Nexus was looked through an urban lens as such perspective is necessary to address the challenges presented by cities and implement the 2030 Agenda. A steadily growing percentage of the world's population is living in cities and towns and thus, cities are in constant demand for resources. The research presented throughout the Conference has demonstrated that cities and towns are fundamentally connected within the broader system of social and ecological processes. Most of the water, energy and food that supports urban living is supplied from rural areas. The supply of these services to the cities in combination to the waste that cities generate has an enormous impact on rural areas, the pattern of rural development, and ecosystems services. For sustainable development then, city planning and design from a Nexus lens becomes crucial. If the 2030 Agenda is to be successfully implemented it is necessary that cities become sustainable and do not exceed planetary boundaries.

Creating governance structures and processes that promote an integrated approach to the goals and targets will be critical to their delivery. Building the capacities to successfully use such governance structures and processes will have to be part of the effort. Increasing communications and building relations among the different government departments and at different scales of governments is essential in addressing the interlinkages and challenges of the SDGs.

As well bridging the gap between policy makers and the scientific community will be essential for informed decision-making that would pave the way for sustainable development. Bridging such gap can facilitate innovative solutions to be implemented and increase the transfer and sharing of technologies from the scientific community to governments and to other stakeholders. Technology and information sharing will be crucial in delivering the SDGs, especially sharing technology and information with least developed communities can contribute to their sustainable development.

Finance and investment – be it public or private – are crucial factors in shaping future development. It is essential that those responsible for directing those flows do so in a way that supports Nexus integration objectives, and abjures unsustainable investments assessed on old-fashioned narrow terms and based on short-term economic criteria. Financial incentives at national and global levels should examine innovative methods to better calibrate incentives to accelerate progress and to measure corporate contribution to the SDGs.

Through the conference the importance of partnerships was highlighted. Multi-stakeholder partnerships and Public Private Partnerships are essential for the implementation of the SDGs as they required to include multiple delivering mechanisms.

The Nexus community is dedicating its work to implementing the 2030 Agenda in an integrated way as an essential path forward for securing a sustainable future. The conference demonstrated that there is a positive energy among the Nexus community who sees the sustainability challenges as opportunities

to increase knowledge, research, and community building. We hope that further Nexus-related research is supported so as to be able to keep contributing to transforming our world towards sustainability.

## Appendix 1: Nexus Tools

<p><b>Wastewater Reuse Effectiveness Index (WREI):</b>  A monitoring tool that aggregates bio-physical, institutional and socio-economic data to track effective response by Member States to risks that arise from inaction or rebound effects of developmental interventions spanning sectors as diverse as water quality, public health, groundwater management and public financing of infrastructure projects.  The United Nations University (UNU) Sustainable Development Goal (SDG) Explorer features WREI as an example of how the science-policy divide can be bridged based on robust partnerships between UNHABITAT (custodian agency for SDG Target 6.3), Member states and the scientific community in Africa, Europe, Asia and South America<sup>1</sup>.</p>
<p><b>Long-range Energy Alternatives Planning System (LEAP):</b>  Developed by the Stockholm Environment Institute (SEI).  Is a powerful and versatile software system, issued for modeling of integrated energy planning and climate change mitigation assessments<sup>2</sup>.</p>
<p><b>Water Evaluation and Planning System (WEAP):</b>  Developed by SEI. It is a software tool for integrated water resources planning. It provided a comprehensive, versatile and user-friendly framework for policy analysis<sup>3</sup>.</p>
<p><b>Energy Portfolio Assessment Tool (EPAT):</b>  Developed by academics Ahmed M. Mroue , Rabi H. Mohtar, Efstratios N. Pistikopoulos, and Mark T. Holtzapple from the Texas A&amp;M University.  Their research, “identifies the links between energy and other systems (water, land, environment, economics, etc.), and measures the impact of energy portfolios, to offer a solid foundation for the best sustainable decision making in energy planning. The paper presents a scenario-based holistic nexus tool, Energy Portfolio Assessment Tool (EPAT), which provides a platform for energy stakeholders and policymakers to create and evaluate the sustainability of various scenarios based on the water-energy- food (WEF) nexus approach.”  “The Energy Portfolio Assessment Tool (EPAT) was developed using the Water-Energy- Food (WEF) Nexus systemic approach to address integrated energy portfolio systems as an alternative to the ‘silo’ approach, and tackles the associated environmental and economic systems. EPAT is a scenario-based tool that enables policymakers to create energy portfolio scenarios, using various energy and electricity sources/technologies, and then evaluate its environmental and economic trade-offs sustainability. The tool assesses various energy portfolio options, taking as input energy production and electricity generation mix (in Giga Joules), and generating quantitative parameters in terms of water withdrawal and consumption (Million Gallons), economics of energy and electricity (US Dollars), carbon emissions (Ton CO<sub>2</sub> ), and land required (km<sup>2</sup>)”<sup>4</sup>.</p>

<sup>1</sup> For further information please visit <https://unu.edu/projects/wastewater-reuse-effectiveness-index.html#outline>

<sup>2</sup> For further information see <https://www.sei.org/projects-and-tools/tools/leap-long-range-energy-alternatives-planning-system/>

<sup>3</sup> For further information please visit <https://www.sei.org/projects-and-tools/tools/weap/>

<sup>4</sup> Ahmed M. Mroue, Rabi H. Mohtar, Efstratios N. Pistikopoulos, and Mark T. Holtzapple. 2018. “ENERGY PORTFOLIO ASSESSMENT TOOL (EPAT): Sustainable energy planning using the WEF nexus approach – Texas case.” Texas A&M University.

**WEAP-LEAP Tool:**

Combines both tools and it is a flexible toolkit that combines GIS based hydrological and temporal modelling that allows for water and energy related constraints to be captured<sup>5</sup>.

**Water-Energy-Food Nexus Tool 2.0 (WEF Tool 2.0):**

It is a Nexus Modelling tool that provides a platform for scientist and policy-makers to evaluate plausible scenarios and identify sustainable resource allocation strategies<sup>6</sup>.

**Water-Energy-Transportation (WET):**

The objective of this tool is to look at the interrelations and trade-offs between water, energy and transportation sectors under different scenarios in a quantitative manner. It serves as an interactive planning tool for assessing the diverse impact of each possible scenario<sup>7</sup>.

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<sup>i</sup> Tier system to assess availability of the indicators

- Tier 1 – internationally agreed methods and data widely available 82 (35%)
  - Tier 2 – agreed methods exist but data are not widely available 61 (26%)
  - Tier 3 – no agreed methods, no data 84 (36%)
- Multiple tiers 5 (2%)

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<sup>5</sup> For further information and case studies regarding this tool see: Energy System Analysis Group of the Royal Institute of Technology. “Tools for analyzing the water-food-energy-ecosystems nexus”. 2015. Retrieved from [https://www.unece.org/fileadmin/DAM/env/water/nexus/Nexus\\_tools\\_final\\_for\\_web.pdf](https://www.unece.org/fileadmin/DAM/env/water/nexus/Nexus_tools_final_for_web.pdf)

<sup>6</sup> Daher, Bassel T., & Hohtar, Rabi, H. 2015. “Water-Energy-Food Nexus Tool 2.0: Guiding Integrative Resource Planning and Decision-making.” *Water International* 40, no.5-6: 748-771.

<sup>7</sup> For more information see: <http://www.wefnexusool.org/wef/background>