SCALING UP POTENTIAL: LEVERAGING PUBLIC-PRIVATE COOPERATION ON SCIENCE AND TECHNOLOGY FOR SDG IMPLEMENTATION

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Background

The United Nations Sustainable Development Goals (SDG)[1] set an agenda that is a plan of action for people, planet and prosperity. All countries and all stakeholders, acting in collaborative partnership, must collectively and collaboratively engage in programs to implement the plan. The requisite action will include not only new scientific and technological development, but also integration of approaches to program development and implementation among actors who may not share the same vision or aligned cultural norms needed for success. The 17 Goals are visionary, ambitious, all-encompassing and interconnected aspirations; according to Weymouth and Hartz-Karp (2018)[2] implementation is seen as a "wicked problem." In a formulation of what is a wicked problem, Rittel and Webber (1973)[3] stated that confronting problems of social policy is subject to failure because of the nature of the problems; whereas, viewing science and technology, there is a recognition that science has developed to deal with 'tame' problems. In the case of social science, or cooperative approaches, there is no objective definition of equity, and there are no solutions in the sense of definitive and objective answers without significant qualification to each statement made- thus difficulty to achieve agreement. The problem is consequential and there is no single clear solution; the effects of the problem are impactful and significant and so are the effects

of the solution. Attention must be paid to collaborative communication and participation. The SDG pose such problems because they engage multilateral interests; the scope is global, national, and subnational; and, engagement necessarily comes from governments, intergovernmental organizations, international non-governmental organizations, national non-governmental organizations, the private sector, and academia. Knowledge, understanding and learning must be shared among the partners- and, partnerships must be developed to create meaningful collaboration and cooperation toward specific goals. The interests of all parties must be considered while at the same time recognizing that the opportunity costs vary among those engaged in strategic planning, development and execution of plans of work to implement the SDG.

Introduction

Weymouth and Hartz-Karp (2018)[4], explored a series of principles for achieving integrated implementation of SDGs, based on the scaling of collaborative problem solving and decision-making, tested in a *cities* model. They suggested that this reform must include new ways of eliciting collective value judgements, basing the judgements on diverse inputs, applying deliberative communications and harnessing distributed and collaborative power and action. The recognized need to form new partnerships supports the notion that we need to reform

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[1] United Nations. 2015. Transforming our World: The 2030 Agenda for Sustainable Development. https://sustainabledevelopment.un.org/post2015/transformingourworld

[2] Weymouth, R. and Hartz-Karp, J. 2018. Principles for Integrating the Implementation of the SDG in Cities. Urban Sci. 2 (77). www.mdpi.com/journal/urbansci.

[3] Rittel, HWJ. and Webber, MM. 1973. Dilemmas in a general theory of planning. Policy Science 4(1973); 155-169.

[4] *ibid*.

governance- the interactions and decision-making within society to resolve collective problems. The ability to leverage public-private cooperation in any dialogue and the perceived inherent biases also present a 'wicked problem' that is difficult to overcome because of resistance to resolution based on availability of incomplete, contradictory, and/or changing information underlying what appears to be the issue. Endl (2017)[5] studied governance as an opportunity to enhance effective program priority and policy for the SDG within *mineral extraction and mineral policy in the EU* (among five country experiences), with no clear set of alternative solutions due to social, institutional and scientific complexities. Governance for SDG principles must include considerations such as policy integration; stakeholder participation; long term vision and short-term action; and, reflexivity and learning. Further, governance at the level of the United Nations, its Members' national efforts, and at the local/on the ground level- each considering the principles necessary for effective implementation of the SDG.

While social norms, national interests and cultural differences may hamper rapid forward SDG movement and 'success,' the potential lack of trust among Members, and non-member actors is an issue that can resolve through governance discussions and clear articulation of respective roles and responsibilities. The path forward for integration of approaches taken by those with differing definitions of 'success' requires that the fundamental foundation for meeting the UN

Sustainable Development Goals (SDG) rely on advances in science and technology. The objectively measured, and incremental, successes in achievement of goals must have systematic and hypothesis-based approaches to collaboration, cooperation and partnership. The 'wicked problem' of how to develop and access public-private cooperation must include established trust and meaningful collaboration. The opportunity for dedicated engagement by the private sector, and the priority to advance sustainability in an integrated and inclusive manner, is the nexus of where communication and collaboration tools will be essential. The ability to collaborate in priority setting, design, and engagement on science and technology-based issues will effectively demonstrate reliability and trust needed for true multi-lateral engagement and leverage of public-private partnerships to positively impact SDG implementation. Conversely, the opportunity lost to successful implementation of the SDG should such collaboration and active engagement be limited is significant. For example, the technological and scientific capabilities within the private sector, including both business and industry, and academic scientists in the United States accounted for roughly 65-70% of research and development funding in 2015 (Besley et al., 2017).[6]

Identification and management of differences in long-held beliefs and perceptions about inclusion of all stakeholders in cooperation for implementation of the UN Strategic Development

[5] Endl, A. 2017. Addressing "Wicked Problems" for Sustainable Development- A Comparative Analysis of National Mineral Policy Approaches in the European Union. Sustainability. 9(10), 1830. www.mdpi.com/2071-1050/9/10/1830.

[6] Besley, JC, McCright, AM, Zahry, NR, Elliott, KC, Kaminski, NE, and Martin, JD. 2017. Perceived Conflict of Interest in Health Science Partnerships. PLos ONE 12(4):e0175643. (https://doi.org/10.1371/journal.pone.0175643)

Goals (SDGs) is needed. While most recognize the essential role of science and technology in the Third Industrial Revolution, the Fourth Industrial Revolution is intended to be a fusion of technologies through communication and connectivity rather than through technology (Schwab, 2016)[7] thereby providing a unique opportunity to improve human communication and conflict resolution.[8] This convergence will require change in the way we live, work and relate to one another.[9] The need to communicate and connect is at the heart of the issue regarding how to leverage public-private cooperation. The UN Economic Commission for Europe (UNECE) has focused its "People First" components of public-private partnerships, including its guiding principles that may create opportunities or obstacles to public private cooperation on SDG implementation.[10] Taking a proactive approach to apparent opportunities is important to ensure private sector engagement and consequent sharing of resources including its far-ranging science and technology capabilities.

International Organization Leadership in Implementing the SDGs

International organizations such as the United Nations (UN) and its development programs clearly lead programs of intergovernmental cooperation, specifically with respect to the SDG Agenda. Within such collaborations is the strong need to establish partnerships with academic scientists, and importantly with the private sector. It is, however, important to recognize that the UN bodies and their national members are responsible to deliver against the Agenda and engaged stakeholders must be aligned with the agenda goals and priorities. At its 2019 UN Environment Assembly, Science and Business Policy Forum (SPBF), a discussion paper discussed the lead role for the UN in digital ecosystems.[11]

SPBF 2019 Recommendation: Fostering engagement and rolling out the digital ecosystem engagement with governments, private sector partners, academics and citizens underpins success of a global ecosystem.

[7] Schwab, K. 2016. The Fourth Industrial Revolution. World Economic Forum. ISBN 1944835008.
[8] "Conflict Resolution in the Fourth Industrial Revolution." (https://www.bbvaopenmind.com/en/conflict-resolution-in-the-fourth-industrial-revolution/). OpenMind.
[9] Morr B. The 4th Industrial Revolution is Here: Are you ready? 08 13 18 Forbes Magazine. (https://www.forbes.com/sites/bernardmarr/2018/08/13/the-4th-industrial-revolution-is-here-are-you-ready/#13306dce628b)
[10] United Nations ECE Program; Guiding Principles on People-First PPP for the UN SDGs. May 2018. Geneva

(https://www.unece.org/fileadmin/DAM/ceci/documents/2018/PPP/Forum/Documents/The_8_Guiding_Principles_for_People-first_PPPs_in_support_of_the_UN_SDGs-Part_II.pdf)
[11] UNEP. 2019. UN Environment 4th Assembly; Science and Policy Business Forum. Discussion paper, "The case for a digital ecosystem for the environment: Bringing together data, algorithms and insights for sustainable development (Banduras, 2018). https://un-spbf.org/wp-content/uploads/2019/03/Digital-Ecosystem-final-2.pdf

As stated by the World Economic Forum [WEF (2014)],[12] governments must maintain a conducive environment and effective channels of interaction for active engagement of the private sector, leading to the strategic development and implementation of the SDG. Such project endeavors require collaborative and cooperative efforts for on-the-ground (local) strategic development and management to successfully implement and complete the work in a manner in keeping with national laws, local environments, and native cultures. The required convergences face political challenges that expose the need for updating, upgrading, and evolving existing structures for assessing potential problems and challenges along with the associated governance issues.

The United Nations Development Group (UNDG, 2015)[13] commissioned a report including eight case studies, intended to review progress against historic UN Development Program (UNDP) strategies and identified goals. UN Country Teams work to ensure UN programs are developed to use international norms and standards for identification and design of intervention strategies as foundational alignment, while recognizing unique national legislation, norms and practices. Those eight case examples, focused on human rights and gender equality, are useful to explore in the context of multi-lateral cooperation if only for consideration of its list of recommendations for best practices in

international development which also are useful to sustainable development. The report speaks to the pivotal role of the UN in global development projects and national alignment with international norms (relating to science and technology but also the human factors) and provides useful resource information to better understand the UN system. The nine general recommendations are useful for consideration and as a reminder of the overall positive convening role played by the UN System. With respect to private sector engagement, it is gratifying to see inclusion of one of the five targeted areas for the UN collective work is the need for promotion of wider stakeholder participation in development processes by using the convening power of the UN as an impartial partner. The private sector strongly supports that area targeted for increased focus.

Case Studies from the United Nations Economic Cooperation of Europe[14]

Under the UN System, regional cooperation groups, such as the UN Economic Cooperation of Europe (UN ECE) are afforded a regional opportunity for peer learning and sharing of practical solutions to implementing the SDGs. Governments and other stakeholders mutually learn from sharing concrete experiences, best practices and challenges; case studies are used to form the basis of peer learning roundtables. In

[12] World Economic Forum. 2014. Insight Report: The Global Competitiveness Report [Schwab, K], Geneva. www.weforum.org/gcr

[13] United Nations Development Group. 2015. Eight Case Studies on Integrating the United Nations' Normative and Operational Work. Commissioned report, September 2015. [https://undg.org/wp-content/uploads/2016/05/Normative-Operational-Study-FINAL.pdf]

[14] United Nations Regional Forum. 2018. Regional Forum for Economic Cooperation in Europe: Case Studies [ECE/RFSD/2018/INFI]. https://www.unece.org/fileadmin/DAM/RCM_Website/RFSD_2018_case_studies_compilation.pdf

May 2018[15] UN Regional Forum for Sustainable Development (RFSD) met to review European case studies in areas under five SDG [water and sanitation; clean energy; cities and communities; responsible consumption and production; and, life on land]. One study example led by Germany ("*Stakeholder dialogue on the national strategy for micropollutants*") was designed as a part of preparation for a German government strategy to protect the aquatic environment against micropollutants. The German government (Federal level) convened a multi-stakeholder dialogue to include the pharmaceutical, chemical, textile and print industry, user side representatives, environmental protection and consumerism organizations, water management companies and local authority representatives. This stakeholder group provided a series of recommendations to policy-makers which will be further mapped out in a study follow-up phase. Such stakeholder engagement was essential for any success, given the project was intended to focus on options for action to reduce inputs to waters from biocides, pesticides, detergents and cosmetics, household and industrial chemicals, and pharmaceuticals. In this case, the inclusion of business in this dialogue was critical to aligned engagement as many of the recommendations necessarily involved action by those stakeholders. Apparently the most difficult challenge was identifying and bringing to the table the right set of stakeholders, which well demonstrates the challenges associated with collaborative engagement, even when led by a national authority.

Most other case studies in the Report had a predetermined strategy with a focus already established. In some cases, business and other non-governmental stakeholders were included in implementation but not in all cases. Several of the studies identified the need for technological development in infrastructure to meet the goals and objectives. Inclusion of science and technology-focused participants could facilitate agreement to resolutions of the issues- but inclusion of such actors after the implementation often leads to a greater drain on resources and increased time to completion, and the potential for diminished engagement on the part of the participants. It is essential that formal and informal arrangements for dialogue between governments and local communities, as well as among private and public actors representing central government and local communities be instituted at all levels of project development from strategy through implementation.

Case Studies Demonstrating Government to Government Collaboration

European Region*:* Various examples of means by which the European Commission is working with its European Union (EU) members and non-members in the general region, to work through collaborations on the 2030 Agenda are provided, including individual country reports, are described in a CONCORD[16] report (2018).[17] The CONCORD

[15] United Nations Regional Forum. 2018. Regional Forum for the European
[16] CONCORD. European NGO confederation for relief and development. Secretariat: Brussels, Belgium. [https://concordeurope.org/who-we-are/]

[17] CONCORD. 2018. SDG's Implementation: Good practices across Europe: Agenda for Sustainable Development, Development Cooperation, Sustainable consumption and production.

program has a set of clear overarching goals, and the mandate to act on the SDG Agenda in a way that also meets the anticipated trade agenda for the EU. Within the Report, case studies from several countries were developed to assess project work aligned with the UN SDG Agenda. One such case study, "*Good Practice I: Estonia – Cross sectorial coalition for Sustainable Development*," wherein the Estonia Coalition for Sustainable Development,[18] an umbrella organization, was created to unite non-governmental organizations, private sector enterprises and state institutions to support the 2030 Agenda for SD. The larger Coalition established a project coalition that represents a unique example of where a state actor, Estonia, brings together multiple stakeholders to enhance engagement from differing perspectives, knowledge and skills across sectors to achieve an agreed goal. Further, the Coalition up-front recognizes the expertise and action potential of the combination of civil society knowledge of how to build a more sustainable society, the private sector's economic power to move towards the agenda, and policy makers with an interest in contributing to a good governance model. This successful multi-national and multi-lateral approach has achieved success in cementing agreed and defined goals, led by a national authority (Estonia) within a region of the globe (EU and neighboring countries), and is but one of many examples of alignment among partners and approaches to collaboration to yield success.

Progress in Other Countries on SDG Goals and Targets

With the global SDGs and targets agreed, the key task now is to bring them to bear at the national level. This will include setting new or aligning existing targets, a focus on implementation, and processes for monitoring and accountability. The Overseas Development Institute developed the first three, of many reports to come, on projected regional progress against the SDG- Latin America and the Caribbean (LAC), Asia-Pacific (PAC) Region, and Sub-Saharan Africa (Nicolai et al., 2016)[19] Each report is presented as a scorecard against projected progress within the region when compared with progress on the Millennium Development Goals (MDG).[20,21]

Latin America and the Caribbean
According to Nicolai et al. (2016), despite its strong overall starting-point, LAC must initiate new efforts to meet many of the SDG goals and targets. While the analysis is based on the global SDG agenda and a selection of targets, a national-level focus is needed for the next stage of analysis and action. LAC is set to make significant gains against three goals and targets, notably reducing inequality, ending extreme poverty, and expanding

[https://concordeurope.org/blog/2018/09/25/sdg-good-practices-from-across-europe/]
[18] Estonia Coalition for Sustainable Development. 2018. [https://www.sei.org/featured/coalition-sustainable-development-founded/]
[19] Nicolai, S, Bhatkal, T, Hoy, C, and Aedy, T. 2016. ODI report Projecting Progress: Reaching the SDGs by 2030 (Nicolai et al., 2015).   Includes Projecting Progress for Latin America, Asia-Pacific and sub-Saharan Africa.

Overseas Development Institute, London UK. [https://www.odi.org/sites/odi.org/UK/files/resource-documents/10592.pdf]
[20] United Nations. Millennium Development Goals (1990-2015). [https://www.un.org/millennium/goals]
[21] United Nations. 2018. Millennium Development Goals. Fact Sheet. [https://www.who.int/en/news-room/fact-sheets/detail/millennium-development-goals-(mdgs)]

energy access. A further seven goals are moving in the right direction, but progress will need to accelerate significantly to reach targets by 2030. Progress on five of the Goals is moving in the wrong direction [reducing slum populations (Goal 11), reducing waste (Goal 12), combating climate change (Goal 13), marine conservation (Goal 14), and reducing violent deaths (Goal 16)]. A slowdown in growth is documented as the average annual GDP per capita growth declined from 3.2% during 2004-2008 to 1.5% in 2014 (referenced from World Bank[22]). Translated, this has resulted in waning social gains, lowering of income growth throughout the distribution and slower poverty reduction. Acceleration of progress needs to occur if LAC is to meet more of the SDG.

Asia-Pacific Region

The referenced 3-region report (Nicolai et al., 2016) includes a sub-report on Asia-Pacific. Nicolai and her colleagues report that Asia-Pacific, as a region, is progressing faster than other regions of the globe. On track to do well on five goals and targets- deforestation, extreme poverty, access to sanitation, energy access, and economic growth in Least Developed Countries (excluding industrialization). Eight goals are progressing, but not at levels anywhere near fast enough to reach targets by 2030.   These are targets where progress needs to speed up by multiples of current rates. This group of goals includes hunger (Goal 2), maternal mortality (Goal 3), secondary-school completion (Goal 4), child marriage (Goal 5), inequality (Goal 10), domestic resource mobilization for development (Goal 17), industrialization in LDCs (Goal 9), and violent deaths (Goal 16). Four SDG goals and targets are

of concern with progress moving in the wrong direction: slum populations (Goal 11), reducing waste (Goal 12), combating climate change (Goal 13), and marine conservation (Goal 14). Across the Asia-Pacific region progress is unequal, and disparities often are persistent. East and South-East Asia are likely to have greater gains on industrialization and peace; South Asia is more positively poised on domestic resource mobilization, than other sub-regions. Significant inequalities also are found in-country, where factors like ethnicity, gender and age lead to certain groups falling behind.

Sub-Saharan Africa Region

The above-referenced 3-region report (Nicolai et al., 2016) includes a sub-report on sub-Saharan Africa. Nicolai and her colleagues report that while goals and targets relating to economic growth and the strengthening of domestic-resource mobilization are set to make considerable progress in sub-Saharan Africa, the majority of goals – including ending extreme poverty (Goal 1), reducing maternal mortality (Goal 3), and access to energy (Goal 7) – must increase the speed of progress by several multiples of current rates in order to reach SDG targets. One group of five goals and targets is particularly concerning. Across sub-Saharan Africa, progress is not proceeding positively- they are regressing in the areas of reducing slum populations (Goal 11), reducing waste (Goal 12), combating climate change (Goal 13), marine conservation (Goal 14) and reducing violent deaths (Goal 16).

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[22] World Bank. 2016. EdStats: Education Statistics. Washington, DC: World Bank.

Nevertheless, progress has been seen, and is possible, across the continent with case studies developed in selected countries in the region that have shown how development progress can be achieved; this includes progress in growth and employment in Ethiopia, poverty reduction in South Africa and improved food security in Ghana, amongst others (see Nicolai et al, 2016 for references specific to individual countries in sub-Saharan Africa).[23]

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[23] Nicolai, S, Hoy, C, Bhatkal, T, and Aedy, T. 2016. Projecting Progress: The Sustainable Development Goals in sub-Saharan Africa.

[https//www.odi.org/odi.org.uk;files;resource-documents/10486.pdf]

Case Studies of Business/Industry-Led Programs to Meet the SDGs
For more business examples, please visit www.businessfor2030.org

To enhance engagement and develop capacity at national and international levels, the substantive involvement of civil society, the private sector and other relevant actors in policy-making processes is critical.[24]

Partnering for impact is at the heart of Novozymes' strategy, and the company understands the need for collaboration to meet the UN SDGs. To encourage a collaborative approach around the SDGs with technology and knowledge freely being shared to solve big problems, Novozymes created **HelloScience**. HelloScience is a digital open innovation and collaboration platform. The platform's purpose is to facilitate collaboration and accelerate innovation with the SDGs as an overarching framework - and SDG6 is currently particularly in focus.

HelloScience was launched in September 2017 and has facilitated over 200 collaboration conversations between users from across 5 continents. It managed to attract more than 500 platform users in 6 months. The platform has 5 water challenges related to SDG6, to encourage meaningful collaboration and innovation. HelloScience is also embracing SDG17 Partnership for the Goals, by partnering with for example **UNICEF** and Grundfos.

So far, HelloScience has helped 6 collaborators, who have proposed promising solutions to the water challenges, with technology and expert business guidance. The platform is being redeveloped and will be relaunched in summer 2018, coinciding with the **UN's Water Action Decade 2018 - 2028**. The relaunch will include a new set of water challenges and a smarter collaboration space. In 2018, HelloScience aims to initiate 3 impactful open innovation projects around SDG6.

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Digital Inclusion means empowering people through information and communication technologies (ICTs). The Digital Inclusion activities of the BDT are designed to promote ICT accessibility and use for the social and economic development of people with specific needs, including indigenous peoples and people living in rural areas; persons with disabilities; women and girls; and youth and children.

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[24] GEO5. 2012. UNEP Global Environmental Outlook: Summary for Policy Makers. http://wedocs.unep.org/bitstream/handle/20.500.11822/8057/-GEO-5%20Summary%20for%20Policy%20Makers-20121089.pdf?sequence=8&isAllowed=y

ITU's work includes sharing information and raising awareness on policies, legislation, regulations and business practices that promote digital inclusion, including through:

- the Girls in ICT Portal,
- the Model ICT Accessibility Policy Report,
- the report "Digital opportunities: Innovative ICT solutions for youth employment",
- the report "Coding bootcamps: a strategy for youth employment",
- the Youth Employment and Entrepreneurship Resources Database, and
- the ITU blog, as well as publications and awareness-raising events

This work takes a holistic approach, recognizing that activities for one group also positively impact the other groups.

IPIECA has partnered with the United Nations Development Programme (UNDP) and the International Finance Corporation (IFC) to develop a shared understanding of the implications of the UN SDGs for the oil and gas industry and how the industry can most effectively contribute. Their joint report, *Mapping the oil and gas industry to the Sustainable Development Goals: An Atlas*, was launched at the UN High-Level Political Forum in New York, USA in July 2017; the UN's central platform for follow-up and review of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.

The Atlas explores the links between the oil and gas industry and the Sustainable Development Goals (SDGs) and seeks to facilitate a shared understanding of how the industry can most effectively support the achievement of the SDGs. The oil and gas industry is committed to responsible and sustainable business, as well as serving as an essential partner to meet the challenge of achieving the SDGs.

The Atlas outlines the typical roles and responsibilities of key stakeholders in enhancing the industry's contribution to sustainable development. It presents examples of good practice in the industry, alongside existing knowledge and resources on sustainable development that could help the industry make useful contributions to the SDGs. *The Atlas* presents the SDGs goal by goal, focusing on the contribution the oil and gas industry can make to each goal by integrating it into core business operations and by identifying opportunities for oil and gas companies to collaborate with other stakeholders and leverage experiences and resources in support of the goal. Each chapter also includes case studies of innovative and sustained efforts by companies, often working collaboratively.

Importance of R&D/Science/Technology for Sustainability

There is a growing consensus among development specialists that research and innovation are critical elements of the international effort to address difficult development issues within the much broader challenge of effectively applying science and technology (S&T) to address problems in many types of physical, political, and economic environments. Science and technology capabilities are fundamental to overcoming many types of problems in developing countries.[25] One positive step taken is 'data philanthropy,' introduced by the UN in 2011,[26] wherein there exists the belief that something positive could come from the wealth of globally collected private sector data that can be pooled and shared in ways that might benefit the general public. Many sharing strategies exist for such data, as noted by UNGP.[27,28] The public sector produces and collects information as an important element of its business strategies. Businesses generally view the welfare of the population as a vital key to expansion and progression of their businesses using those data, but importantly also recognize the value of such

data streams to create potential solutions to address global issues of humanitarian aid, climate effects, health and nutritional changes, and many others. For those who may be skeptical about the role of the private sector in development of 'big data,' Jim Fruchterman, CEO of Benetech, a nonprofit US-based technology company[29] speaks to the many-fold rationale for business engagement in data development and data sharing. He acknowledges that without some profit in data generation, the private sector likely would not develop great technology; however, his company focusses on finding sustainable ways to develop technology for the social good. Myriad sources of data exist which, when accessed and combined, can lead to development programs focused on identified areas of common need directed to social good.

Private Sector Engagement in Implementation of the SDGs

Data developed by public and private enterprises offers promise for potential sharing and collaboration of scientific and technological developments among governments and with private sector actors having access to resources to

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[25] National Research Council/National Academy of Sciences. 2006. *The Fundamental Role of Science and Technology in International Development: An Imperative for the U.S. Agency for International Development.* Washington, DC: The National Academies Press. https://doi.org/10.17226/11583.
[26] United Nations Global Pulse. Kirkpatrick, R. 2011. Public and Private Sector Data Sharing for Global Resilience. https://www.unglobalpulse.org/blog/data-philanthropy-public-private-sector-data-sharing-global-resilience

[27] Pawelke, A. and Tatevossian, A. 2013. Data philanthropy: where are we now? http//www.unglobalpulse.org/data-philanthropy-where-are-we-now). United National Global Pulse.
[28] Coren, M. 2011. Data Philanthropy: Open data for world-changing solutions. (http/www.fastcoexist.com/1678963/data-philanthropy-open-data-for-world-changing-solutions). Fast Company.
[29] Fruchterman, J. 2013. Big Data Means More than Big Profits. Social Enterprise (an online debate about How Big Data Can Have a Social Impact). Harvard Business Publishing.

explore global problems. While many collaborative efforts can be used to explore such "big data," myriad opportunities also exist for new ideas and concepts to be considered through mutual data sharing. The data exist; it is in the public's best interest to share its specific need, as well as any strategies and collaborative thinking, to deliver new areas of work for potential collaboration.

Big data and geo-observation: collaborations such as "Eye on Earth," a consortium of global, thematic and regional networks' partnership, is responsible for building and mobilizing international support to help meet the SDGs, with the UN Environmental Program as a partner. According to UNEP (2019)[30], science-business partnerships for innovative data technologies that accelerate implementation of the SDGs are a foundation for ensuring data are collected, processed and used to develop insights.

Without high quality data that are collected in a special context, it is almost impossible to design, monitor, and evaluate effective policies that can achieve the SDGs.

Collaborators largely come from governments (Australia, European Commission, United Arab Emirates), governmental organizations (US Environmental Protection Agency, Australian Commonwealth Scientific and Industrial Research Organization), intergovernmental organizations within the United Nations, although some non-

governmental organizations such as National Geographic and Nature Serve and academics also actively participate.

Humanitarian Open Street Map Team (HOT)- designed to provide data to support non-governmental organizations and government initiatives on specific issues, including public health, water and sanitation, clean energy, and poverty elimination. The crowd-sourcing means by which these data are collected is driven by a strategic plan, specifically identified countries and issue areas. Business engagement appears to be limited. Within HOT, maps are created to help connect local people to health services and highlight areas to improve provision and quality of public health[31] but could be expanded given appropriate planning and stakeholder inclusion.

If we are to engage in progress within the 4th Industrial Revolution, a clear definition of roles and responsibilities, and well-articulated and agreed priorities and responsibilities must be in place. The management of such a collaboration is a concern for the private sector, as trust within coalitions and collaborations must be gained- the private sector likely will not be afforded the opportunity to take a leadership role. It is of paramount importance to recognize that the potential conflict created by, and lack of trust inherent in, private sector engagement and resource support must be addressed in the context of SDG implementation and success on both global and local levels. Therefore, the private sector must be at the table, and its voices must be heard- what the industry can contribute is based

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[30] *Ibid.* https://un-spbf.org/wp-content/uploads/2019/03/Digital-Ecosystem-final-2.pdf

[31] HOT. https://www.hotosm.org/what-we-do.

on strategically developed plans and resource provisions- realistic understanding and trust that resources provided are used appropriately are necessary components of project planning if such collaborations are to proceed in good faith.

At UNEP-GEO5 (2012),[32] a review of progress against SDGs and potential for the future included recommendations for policy makers (see text box).

> • *Multi-level/multi-stakeholder participation;*
> • *increased introduction of the principle of subsidiarity;*
> • *governance at local levels;*
> • *policy synergy and removal of conflict;*
> • *strategic environmental assessment;*
> • *accounting systems that value natural capital and ecosystem services;*
> • *improved access to information, public participation and environmental justice;*
> • *capacity strengthening of all actors;*
> • *improved goal setting and monitoring systems.*
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> *UNEP-GEO, 2012.*

There is an increasingly strong recognition of the need to include all stakeholders in dialogue regarding strategy, policy and implementation in environmental goals. The historic expectation is that with private support, 'strings' will be attached to the provision of resources. Businesses do have an expectation of return on investment, in the big picture. However, when it comes to the public good, business also have the interest (and obligation) to consider the public good and how best its resources can be directed to such.

Complications to Fiscal Support for Public-Private Collaboration to Meet the SDGs

Engagement with multi-lateral partners requires setting aside prejudice and pre-conceived notions about 'other' stakeholders. It is incumbent upon each partner within the collaboration to demonstrate his capabilities, resources, and commitment through engagement, communication and cooperation. Further, foundational ways forward must be agreed upon front, and then accepted and adopted by all members of the collaboration. There remains a tendency to pre-judge or over-generalize about sources of scientific or technical inputs or resources from the private sector (business funded or operational resources) that ignores the opportunity cost. Measures do exist to verify credibility of scientific findings from research and development efforts,

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[32] GEO (Global Environmental Outlook)5-UNEP.2012. Summary for Policy Makers. http://wedocs.unep.org/bitstream/handle/20.500.11822/8057/-GEO-5%20Summary%20for%20Policy%20Makers-20121089.pdf?sequence=8&isAllowed=y

regardless of the funding source, through peer review and due diligence; all criteria for engagement in provision of resources must be agreed at the initiation of the collaboration and thus can be managed during the progress of the initiative.

Business and industry also collaborate with universities to conduct joint research or fund university-run research programs and studies. And as with government agency, university, or non-profit-funded studies, industry-funded studies often are peer-reviewed and published in prestigious journals. Research, science and technology development performed by the private sector includes stopgaps to ensure products are safe and that studies are conducted under ethical protocol, regardless of where they are conducted. Further, the private sector employs more highly educated and trained scientists than the government, non-profit organizations, and universities combined,[33] and has a demonstrated history of quality research offered into the public domain. Such research is intended to provide foundational information, and outcomes for application in the field.

Industry is an increasingly important but controversial source of funding for scientific research and development (R&D) in the United States US). Whereas the federal government funded roughly two-thirds of R&D in the US during the 1960s and 1970s, this relationship is now flipped so that in the 2000s private industry is now

funding roughly two-thirds of research in the US.[34] Governmental funders often have encouraged research collaborations between private industry and universities. As governmental R&D budgets have been slashed, industry has increased its support of university research, providing $3.2 billion to universities in 2012.

Though many have questioned partnerships with the private sector, new research from the University of California, Berkley and the US National Academy of Sciences (NAS) reported,[35] "corporate-sponsored research is surprisingly valuable for further innovation. Data collected over 20 years at nine campuses and three national laboratories, administered by the University of California, show that corporate-sponsored inventions are licensed and cited more often than federally sponsored ones." Furthermore, governments encourage such collaboration as it is seen to spur innovation that brings jobs, investment and life-enhancing products.

The opportunity to transfer such study learnings outside the academic or business setting amply demonstrates the success with which the private sector has engaged in partnerships that have furthered the public good within the US and around the world. Nevertheless, there is a tendency to dismiss industry-supported research and collaboration based on historic alignments seen as illegitimate. This perceived bias has largely been reduced due to publication

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[33] Center for Accountability in Science. 2019. Center for Organizational Research and Education. https://www.accountablescience.com/issues/funding-in-science/industry-funded-research/

[34] National Science Board. Research and development: National trends and international comparisons (Chapter 4). Washington, DC: National Science Foundation, 2014 October 22, 2014.

[35] Wright, BD., Drivas, K., and Merrill, SA. 2014. Technology transfer: Industry funded academic investments boost innovation. Nature. Vol 507 (pp 297-299). https://www.nature.com/news/technology-transfer-industry-funded-academic-inventions-boost-innovation-1.14874#/ref-link-2

requirements and ethics engagement at private sector institutions and publicly funded universities.

Most researchers acknowledge that doing away with industry funding of research is not the answer to criticism about funding bias. Instead, researchers and members of industry are promoting greater transparency and access to information about innovation. As with studies funded by other sources, if third party scientists can replicate research done by those receiving industry funding, it lends much more credibility to the researchers' findings.

In a recent study conducted at the University of Michigan [US (Besley et al.) 2017][36] researchers recognized a consistent 'perceived bias in study outcomes when an industry partner was named as a collaborator in a research study, regardless of whether the industry source partnered with a governmental agency, university or an academic scientist, and/or a non-governmental organization (NGO). Regardless of the partners named in the study, inclusion of industry partners consistently reduced the perceived reliability (or raised the 'bias' factor) of the outcome while inclusion of an NGO partner consistently raised the perceived reliability (or reduced the perceived bias) of the study. This is problematic given that increasingly industry/business resources are part of development and discovery research, and specifically in support for implementation of the SDGs.

Given the resource need for capacity building in developing countries, such support by the private sector is essential to many countries' abilities to meet SDG implementation goals. Building trust in all partners, public and private sector, at the strategic, policy, and national/local levels must be an element to accomplish the prioritization and delivery of services to meet the SDG.

Within the UN Convention of Biological Diversity (CBD), Strategic Plan[37] are five goals and 20 targets (AICHI, Japan). Strategic Goal E, mainstreaming biodiversity across governments and society includes four targets. Target #19 says that "by 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied. Recommendations for action are included and would be useful as a goal for multi-lateral and multi-stakeholder engagement to meet the SDGs with greater efficiency and potential success.

Recommendations for Action: Strengthen multi-stakeholder partnerships among companies, industry associations, civil society, and governments, to promote sustainable practices.

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[36] Besley JC, McCright AM, Zahry NR, Elliott KC, Kaminski NE, Martin JD (2017) Perceived conflict of interest in health science partnerships. PLoS ONE 12(4): e0175643. https://doi.org/10.1371/journal.pone.0175643 pmid:28426697

[37] UN Convention of Biological Diversity. Accessed 4.12.19. Strategic Plan 2011-2020. The IUCN Species Program; strategic plan for diversity with AICHI 20 targets on biodiversity. https://www.cbd.int/sp/targets/

Recommendations for Discussion

So, where does all of this leave us with respect to inclusion of the private sector to cooperate or partner with national governments, intergovernmental organizations or the public sector generally on science and technology for SDG implementation. There is no question about the importance of the scientific basis and technical resources available from the private sector to address challenges, to find innovative opportunities and solutions, and to serve more people to the benefit of the public good. Furthermore, strategically designed innovative solutions with the provision of more advanced technology, as provided through private sector resources, can help target, identify and direct action to make a difference, particularly on big "global commons" topics such as climate change.

In the current environment, private sector collaboration with academia and other stakeholders tends to be, for the most part, one-off agreements on projects with the private sector providing the funding support but with no opportunity for collaborative effort that might better be strategically envisioned. Another opportunity exists, wherein consortia (Science Parks[38]) are developed to share the science economy and engage other stakeholders where the technology is developed. However, this also currently provides limited-scale projects, and limited access to resources and collaborative stakeholder strategic planning and project execution.

In 2006, the National Research Council of the US National Academy of Sciences[39] reported the opportunities and positive contributions essential for international development based on enhanced and future-looking scientific and technological advancements. While the document speaks to issues with funding for the US Agency for International Development, its relevance to other international organizations and global development is clear. Private sector involvement in large scale assessments [IPCC (Intergovernmental Panel on Climate Change), GEO (Global Environmental Outlook), IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services)] largely are driven by intergovernmental actors, but are good examples of how some projects within the UN system that variously include business/industry interests can be wildly successful and others fail to materialize based on bias, failure to plan or follow through, or failure to cooperate/manage/resource.

The smaller scale, but extremely important role of private sector actors to provide expert advice and technical inputs based on specific project or program needs must be supported and encouraged. However, even this approach to

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[38] Cabral R and Dahab SS. 1998. The Cabral-Dahab Science Park Management Paradigm: An introduction. International Journal of Technology Management. Vol 16(8); 726-739. Includes studies of eight parks around the global for information development and transfer among academia, business and industry through research). Geneva, Switzerland. (https://www.deepdyve.com/lp/inderscience-

publishers/the-cabral-dahab-science-park-management-paradigm-an-introduction-pIon0j0Ch2)
[39] National Research Council/National Academy of Sciences. 2006. *The Fundamental Role of Science and Technology in International Development: An Imperative for the U.S. Agency for International Development.* Washington, DC: The National Academies Press. https://doi.org/10.17226/11583.

collaboration can be perceived as biased. To minimize perception of wrongdoing or unethical approaches that are not designed to meet the needs to the target population, or that don't move the SDA Agenda, there needs to be a clear articulation of what is an expert; what criteria are needed to establish credibility and capabilities; how will expert advice be handled and managed; and, how will scientists be tasked with work that will be seen as acceptable to stakeholders and those countries in receipt of the provision of such work or advice. These wicked questions beg resolution- but it will not be easy- 'who is credible,' 'who is an expert,' and what level of transparent documentation will permit more freedom in access to experts and use of their data?

Challenges ahead/Searching for opportunities to leapfrog and scale

o Constructing dialogue and input opportunities that are accessible to business and timely for policy advice and process- to the extent possible, alongside other stakeholders in the process

o Overcoming perceptions of bias and lack of credibility—this should be a point for discussion because it all comes down to that as a fundamental.

o Ethics[40], criteria for establishment of credibility of stakeholders and their resources (including their science), etc.

o Sharing/accessibility of information – "data philanthropy" and crowdsourcing as it applies to SDGs- many examples of data philanthropy by industry (in agriculture, communications networks, data gathering, etc.)—and how to make the data most widely available.

o Technology cooperation and sharing

Questions and Areas of Discussion

The human reaction to change is resistance- but, for meaningful collaboration and progress to be seen, there exists a need to suspend prejudice about '*new ways'* of conducting our work.

• Who could lead the change effort;

• Who would be able to lend credence to such a change; who could be trustworthy; and,

• How could an approach to inclusion of historic and disparate positions be developed to permit meaningful dialogue and direction for collaborative change?

1. **Which elements are needed to build trust among stakeholders (with an eye to cultural determination and bias)?[41]**

   a. Ethics or ethical criteria

   b. Respect (individual and collective)

   c. Common language (defined terms, timeframes, etc.—and which is success)

   d. Agreed rules of engagement

   e. Discipline to 'enforce' rules or agreement to level of enforcement to be taken

   f. Criteria for various elements identified and defined (and agreed)

   g. Demonstration of competence (we would all agree that you need to demonstrate that you know what you are talking about to build trust)- election to role may not be adequate to agree about level of competence- and then what if the stakeholder is engaged?

2. **Which organizational examples could be elaborated (depending on level of participation) such as the objective, science and risk-based approaches taken in Codex, ISO, OECD?**

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[40] United Nations Ethics Office. Geneva Switzerland.
http://www.un.org/en/ethics/standvalue.shtml
[41] Elahee MN. 2019, The role of trust in international business negotiations: A culturally determined perspective. (https://pdfs.semanticscholar.org/05e9/46cda6519044e7126a8ab772a1efa492a32d.pdf)

About the 'All In' Campaign

Faced with the urgent need to make faster and smarter progress towards achieving the ambitions of a range of international agreements, including the Addis Ababa Action Agenda, the 2030 Agenda for Sustainable Development and the UN Framework on Climate Change, inclusive multilateralism is essential.

'All In' seeks to spark a global conversation about the benefits of inclusive multilateralism, which we hope will move the needle towards more effective ways to involve business and other important stakeholders in the UN system while maintaining transparency and accountability and strengthening the intergovernmental nature of the multilateral system.

In 2019, 'All In' is bringing policymakers, representatives of UN bodies, NGOs and academia together global businesses together in UN cities to discuss ways to engage all industry sectors to achieve the SDG goals and other 2015 outcomes through dialogue and partnership. Our objective is to identify opportunities to address challenges and further opportunities to promote inclusiveness, build trust and scale up measurable impact, which we will include in a collaborative 'All In' Action plan to be launched in 2020.

About USCIB

The United States Council for International Business advances the global interests of American business. We do so through advocacy that calls for an open system of world trade, finance and investment, where business can flourish and contribute to economic growth, human welfare and environmental protection.

HOW WE OPERATE

USCIB's advocacy spans a broad range of policy issues, leveraging the expertise of our business members and a unique network of global business organizations: the International Chamber of Commerce (ICC), Business at OECD (BIAC), and the International Organization of Employers (IOE). Through these organizations' official consultative status in major intergovernmental forums, USCIB represents American business positions both to the U.S. government and throughout the UN system, the OECD and the International Labor Organization.

Our policy positions are developed by our membership, encompassing more than 300 global corporations, professional firms and industry associations, who work through our committees to provide business input for USCIB to convey to policymakers at home and abroad

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