

Localization of SDGs through Disaggregation of KPI's

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Abstract

The United Nation's Agenda 2030 and Sustainable Development Goals (SDGs) pick up where the Millennium Development Goals (MDGs) left off. The SDGs set forth a formidable task for the global community and international sustainable development over the next 15 years. Learning from the successes and failures of the MDGs, government officials, development experts, and many other groups understood that localization is necessary to accomplish the SDGs but how and what to localize remained as questions to be answered. The UN Inter-Agency and Expert Group on Sustainable Development Goal Indicators (UN IAEG-SDGI) sought to answer these questions through understanding the metadata behind the 17 goals, 169 associated targets and corresponding indicators of the SDGs. Data management is key to understanding how and what to localize but to do it properly the data and metadata needs to be properly disaggregated. This paper reviews the utilization of disaggregation analysis for localization and demonstrates the process of identifying opportunities for subnational interventions to achieve multiple targets and indicators. A case study on SDG 6: Water and Sanitation is used to elucidate these points. Some limitations were identified but are greatly outweighed by the potential good of this tool. The examples presented here are only illustrative -- future research and the development of an analytical framework for disaggregation and localization of the SDGs would be a valuable tool for national and local governments, implementing partners and other interested parties.

Key words: Localization, Disaggregation, Sustainable Development Goals, Data, Monitoring and Evaluation, International Development, Statistical Analysis

Introduction

The Sustainable Development Goals (SDGs), also known as the 2030 Agenda, came into effect on January 1st, 2016. With these goals, the United Nations set forth a formidable task for the global community following the Millennium Development Goals (MDGs). The SDGs consist of 17 goals and 169 associated targets that provide an opportunity to integrate development goals, and focus on the sustainable development of not only least-developed countries (LDCs), but all countries around the world.¹ The MDGs took step towards multi-tiered development and poverty eradication, but they ignored problems of limited local capacities and poor data management. The adoption of the SDGs is evidence of global commitment to sustainable development post-2015 and is a platform on which to take action. Much of the attention on the SDGs remains at the policy level, but now is the time to begin focusing on how the goals will be implemented, and avoiding some of the major problems observed with the MDGs. Cities, drivers of economic growth, and metropolitan areas often account for a quarter or more of GDP in both OECD and LDCs. The performance of urbanizing areas in job creation, services and sustainability varies substantially, and urban areas in LDCs face particular challenges in accessing adequate resources.

Establishing a coordinated effort towards economic, environmental and social development that is driven organically and can be sustained over time will require localization. Localization, or working at the subnational level with respect to specific locales and markets, is an important aspect to implement the SDGs. The Agenda 2030 takes into account limitations the MDGs faced with respect to localization and raises the question of how cross-cutting and sector-specific goals, data, and monitoring and evaluation will be executed effectively and efficiently.² However, the key elements of what is meant by localization and how monitoring, evaluation and data will be managed are still unclear.

Data science is used to analyze and make sense of the all the pieces of information created, and potentially collected, every moment of every day. Data for a long time was associated with hard sciences, and it wasn't until 1989 that the first Knowledge Discovery in Databases workshop presented the concepts of data mining and use of data as a predictive tool.³ The role of data as a development tool comes into play in the early 2000s.

A few years after the 2000 Millennium Summit that launched the MDGs, the Marrakech Action Plan for Statistics is agreed upon at the Second International Roundtable on Managing for Development Results in Morocco in 2004⁴. Understanding the shortfalls of the MDGs as it related to data management, SDG targets 17.18⁵ and 17.19⁶ refer directly to capacity building linked to data, monitoring and accountability. To further reinforce the commitment to data management, the *Cape Town Global Action Plan for Sustainable Development Data* (Cape Town Plan) proposed six strategic areas with its own objectives and implementation actions in January 2017.⁷ The Cape Town Plan and its objectives and action items frequently mention

¹ <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

² Economic and Social Council. "Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators." United Nations. Feb. 19, 2016.

³ <https://www.forbes.com/sites/gilpress/2013/05/28/a-very-short-history-of-data-science/#78ed70c455cf>

⁴ <http://www.worldbank.org/en/data/statistical-capacity-building/marrakech-action-plan-for-statistics>

⁵ Target 17.18, "By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts".

⁶ Target 17.19, "By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity building in developing countries"

⁷ <https://undataforum.org/WorldDataForum/wp-content/uploads/2017/01/Cape-Town-Action-Plan-For-Data-Jan2017.pdf>

data disaggregation and this policy underpins the United Nations (UN) resolution of the SDGs “to leave no one behind” this go around.

Localization and data disaggregation are two key tools for SDG implementation. But what impact do these core SDGs have on local governments? How can these paradigms work together to not only overcome the issues with the MDGs, but also to help communities achieve the key performance indicators of the SDGs?

Background

Although criticized on several fronts, the MDGs were the first unified attempt to put sustainable development at the forefront of the world’s political leaders. For the SDGs to succeed, global leaders need to learn from the MDGs failures. This section focuses on the MDGs and SDGs as they relate to data, disaggregation, and localization.

Data as it pertains to monitoring, evaluation and management, were big concerns for the post-2015 agenda because of the issues of data with the MDGs.⁸ In their 2011 analysis article, Poku and Whitman identified several data issues related to the MDGs: the 1990 baseline statistics were not available; the indicators were not being compiled by government agencies within national statistical systems; indicators may not be comparable across countries because of differences in compilation methodologies and/or definitions; some indicators may not be consistent across years because of differences in data sources; and most of the indicators are not compiled at sub-national level.⁹ In some cases, data points on MDG performance have been estimated or modeled by international agencies. The Overseas Development Institute (ODI) also states that the data gaps are more serious than just statistical errors in reporting, they mean the data missing could have been used to improve the lives of those in LDCs and data gaps impact the accuracy of government plans and affect the allocation efficiency of budgets.¹⁰ Thus, the issues related to data are not limited to reliability or availability.

Jerven, in a working paper for the Copenhagen Consensus Center, argues that proper monitoring of all 18 MDG targets and 48 indicators would have cost the United Nations approximately \$27bn.¹¹ The total cost looks high, but when compared to the total of about \$1.9tn spent globally on development aid over the same period, 1.4% of the total Overseas Development Aid (ODA) is within reason. Jerven and others argue that when it comes to monitoring and evaluation (M&E), there are more estimations than hard numbers with the MDGs, and these estimations are more likely observations with no consistent formulaic approach. Jerven estimates that to accurately monitor for the current SDGs, 17 goals, 169 targets and plethora of indicators, it will cost at least \$254bn, which is more than the global spend on ODA annually or 12.5% of ODA aid over the SDG timeframe. In addition to the cost of M&E, there was and still is the local capacity issue. About 60 countries have basic data management systems required for M&E at this scale and most LDCs do not have the capacity to collect useful data on a national basis.¹² The \$254bn estimate also does not account for staffing, operation and maintenance, training and retaining personnel, analyzing, or disseminating the data.

⁸ Economic and Social Council. “Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators.” United Nations. Feb. 19, 2016.

⁹ Nana K. Poku and Jim Whitman. The Millennium Development Goals and Development after 2015. *Third World Quarterly*, 32(1):181–198, February 2011.

¹⁰ Elizabeth Stuart et al. The data revolution: Finding the missing millions. ODI Research Report 3, Overseas Development Institute (ODI), 203. 2015.

¹¹ Morten Jerven. Benefits and Costs of the Data for Development Targets for the Post-2015 Development Agenda. Copenhagen Consensus Center. September 16, 2014

¹² https://unstats.un.org/home/nso_sites/

There has to be a concerted effort for SDG data management that takes into consideration total cost of ownership. The Addis Ababa Action Agenda (AAAA) emphasizes the importance of high quality disaggregated data and prioritizes capacity building in this area with the understanding that tracking SDG progress will further strain already stressed LDC's administrative offices, specifically National Statistical Systems (NSS), to collect and analyze data in new areas.¹³ AAAA also understands that this shift to better data management will require increasing resources for data and building capacity, with the support of the international community financially, in-kind, or both as needed. The Cape Town Plan furthers the AAAA, highlighting the principles of *completeness of scope, accountability, and cooperation* in order to accomplish its strategic areas and objectives for better disaggregated data management. Whereas the issues with the MDGs focused on the data, many feel that disaggregation of data will be the challenge for the SDGs.

Disaggregated data refers to numerical or non-numerical inputs that have been (1) collected from multiple sources and/or on multiple measures, variables, or individuals; (2) compiled into aggregate data—i.e., summaries of data—typically for the purposes of public reporting or statistical analysis; and then (3) broken down in component parts or smaller units of data.¹⁴ Data disaggregation looks to uncover discrepancies that aggregated data can mask by breaking down the data into appropriate groups. A tool long used in the education and health sectors, through disaggregation policy interventions can be developed based on the correct statistical evidence for the appropriate audience and the appropriate level. It also promotes cost-efficiency in the implementation of interventions so that limited resources are utilized where they are needed most and can have the most visible impact. In the USA the Affordable Care Act has promoted the use of data disaggregation in order to more accurately address the needs of Asian Americans and Pacific Islanders and other ethnic subgroups.¹⁵

For the SDGs, the Inter-agency Expert Group on SDG Indicators¹⁶ (IAEG-SDGs) was convened to look at data management for the SDGs overall as well as ensure that, “Sustainable Development Goal indicators should be disaggregated, where relevant, by income, sex, age, race, ethnicity, migratory status, disability and geographic locations.”¹⁷ The IAEG-SDGs classified the 244 (232 with 9 repeated twice or three times) indicators into three tiers on the basis of their level of methodological development and the availability of data at the global level¹⁸:

- Tier 1: metadata are fully developed and data are available
- Tier 2: metadata are developed but data is not readily available or sparse
- Tier 3: methodological work is necessary to further develop the indicator metadata

The Center for Global Development selected those indicators that have an impact on the SDG mantra of “leaving no one behind” and found that none of them have data disaggregated by income, race, ethnicity, migratory status, or disability status or relevant subgroups.¹⁹ What does this mean for the SDGs? It means that SDGs are moving in the right direction but need to shore up their weaknesses with regards to disaggregation in order to properly assess the impact of interventions for vulnerable subgroups.

The MDGs fell short of many targets and goals because they lacked local capacity, ownership, and the leadership required to implement goals and achieve the respective

¹³ Financing for Development. “Addis Ababa Action Agenda of the Third International Conference on Financing for Development.” United Nations. Jul. 27, 2015

¹⁴ <http://edglossary.org>

¹⁵ <https://sites.ed.gov/aapi/aapi-data-disaggregation/>

¹⁶ <https://unstats.un.org/sdgs/iaeg-sdgs/>

¹⁷ <https://unstats.un.org/sdgs/meetings/sdg-seminar-seoul-2016/>

¹⁸ <https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/>

¹⁹ Jared Kalow and Megan O'Donnell. To Leave No One Behind, Data Disaggregation Needs to Catch Up. January 17, 2017

indicators. While the MDGs globalized international development, they did not fully localize it. The SDGs allude to the necessity of localization, mainly addressing change at the national policy level when more attention needs to be given to the local/subnational level. Localization matters for the SDGs because success depends on each country being responsible for their own economic and social development.²⁰ Each country needs a mix of implementation methods and financial instruments in order to benefit from technology transfers and other supportive mechanisms. Financial mechanisms include national and local sources, transfers and borrowing. Implementation methods can be public, private, or a blend. These processes require increased attention to subnational considerations and variations.

Building local responsibility requires focusing on SDGs that are relevant, applicable and attainable at the local level, thus creating a sense of communal ownership for their future development. This approach will also increase accountability of both local and national governments. SDG localization can occur within a spectrum of implementing the goals at the local level by subnational actors (governments, civil society, and businesses) and monitoring progress at the subnational level. Localization calls for an increased emphasis for partner countries to move away from allowing or contracting global entities to manage local projects and instead increase engagement with local governments, NGOs, and businesses, even if external resources and support are needed. Local capacity development will be necessary to understand who is responsible and where variations are between and within countries. This will allow the creation of interventions that balance increased responsibilities, resources and support, and promote more locally determined solutions that are problem and context driven.

The goal of localization is the prioritization of subnational planning and resource allocation by local government in a specific sector based on subnational variations.²¹ Inequalities within countries can be identified and levels assessed to establish progress trajectories. This would require that most outcome-based targets merit disaggregation at the subnational level with local governments, thus placing more emphasis on a sub-set of goals corresponding to these subnational variations. Along the spectrum, implementation and monitoring are not mutually exclusive and face similar problems with regards to localization.

The following section will apply concepts of localization and data disaggregation to SDG 6: *Ensure availability and sustainable management of water and sanitation for all.*

Case Study

Overall, the SDGs are a set of goals that are interdependent and their individual success depends on progress in other areas. Water supply and Sanitation (WATSAN) is an existing issue in developing countries and a growing concern in developed ones. The *Food-Energy-Water* nexus, UNESCO's *Potential Conflict to Cooperation Potential*²², and the proceedings of the 2017 American Planning Association all emphasize the importance of a coordinated approach towards water management.²³ WATSAN is of particular importance for urban areas when taking into consideration population growth, pollution, climate variability, and water variability over the coming decades. It is important to note that WATSAN is an example of the wide horizontal variations across nations and even within. Although the service delivery is part of the mandate of a central or subnational government, lack of capacity and/or resources often leads to a myriad of partnerships with formal and informal, public and private, small to international service providers. WATSAN was high on the priority list in the 2030 Agenda after

²⁰ General Assembly. "Resolution adopted by the General Assembly on 25 September 2015: 70/1." United Nations. Oct. 21 2015.

²¹ Lucci. Paula. "Localising the Post-2015 agenda: What does it mean in practice?" Overseas Development Institute. Jan. 2015

²² <http://www.unesco.org/new/en/pccp>

²³ <https://www.planning.org/divisions/groups/water/>

its minor role in the MDGs (MDG 7, Target 10), and was addressed with SDG 6: Water and Sanitation. As localization of the SDGs is vital for the transition from relief efforts towards actual development, disaggregation of the SDGs involves the dissection and reorganization of indicators (once completed and confirmed) by sector or theme. Below are the targets and respective indicators for SDG 6:

Goal 6. Ensure availability and sustainable management of water and sanitation for all			
Target	Indicator	Tier	Custodian
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 Proportion of population using safely managed drinking water services	I	WHO UNICEF
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	I	WHO UNICEF
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of wastewater safely treated	II	WHO UN-Habitat UNSD
	6.3.2 Proportion of bodies of water with good ambient water quality	III	UN Environment
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1 Change in water-use efficiency over time	III	FAO
	6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	II	FAO
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 Degree of integrated water resources management implementation (0-100)	II	UN Environment
	6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	II	UNESCO UNECE
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time	III	UN Environment
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.a.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	I	WHO UN Environment OECD
6.b Support and strengthen the participation of local communities in improving water and sanitation management	6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	I	WHO UN Environment OECD

Table 1: SDG 6 Targets and Indicators. Source IAEG-SDG

In regards to the classifications of the SDG, UN Water states that four indicators are tier I, four are tier II, and three are tier III as of May 2017.²⁴ which shows improvement from the Center for Global Development's report dated January 2017 where only two were tier 1.²⁵ The tiers themselves state whether the metadata is developed and if respective NSS's have the data available, but the issue of disaggregation is not addressed. SDG 6 targets and indicators do not specifically mention any vulnerable populations related to gender, age, disability, socio-

²⁴ <http://www.unwater.org/publications/sdg-6-indicators-tiering-system/>

²⁵ Jared Kalow and Megan O'Donnell. To Leave No One Behind, Data Disaggregation Needs to Catch Up. January 17, 2017

economic status, etc. In theory, disaggregated indicators can demand that data collected ask for this additional information.

Disaggregated SDG	
SDG 6 Target	Related SDG Target
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance
	2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons
	3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births
	3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases
	3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
	4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes
	4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations
	5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate
	10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard
	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance
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	3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births
	3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases
	3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
	4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all
	4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes
	4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

	<p>5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation</p> <p>8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment</p> <p>10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard</p> <p>11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums</p>
<p>6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally</p>	<p>3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases</p> <p>3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p>9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</p> <p>11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management</p> <p>12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment</p> <p>15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements</p>
<p>6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity</p>	<p>1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance</p> <p>1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters</p> <p>2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality</p> <p>4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development</p> <p>7.1 By 2030, ensure universal access to affordable, reliable and modern energy services</p> <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix</p> <p>9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</p> <p>9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States</p> <p>12.2 By 2030, achieve the sustainable management and efficient use of natural resources</p>

	<p>15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements</p>
<p>6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate</p>	<p>9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all</p> <p>9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</p> <p>11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning</p> <p>11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels</p> <p>11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations</p> <p>12.2 By 2030, achieve the sustainable management and efficient use of natural resources</p> <p>16.1 Significantly reduce all forms of violence and related death rates everywhere</p> <p>16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance</p> <p>17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism</p> <p>17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed</p> <p>17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology</p>
<p>6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes</p>	<p>9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</p> <p>11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations</p> <p>12.2 By 2030, achieve the sustainable management and efficient use of natural resources</p> <p>12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment</p> <p>12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature</p> <p>13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning</p> <p>14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution</p>

	15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
	15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world
	15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species
	15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

Table 2: Related Goals and Targets to SDG 6

Another way to disaggregate the data is relative to other SDGs, their targets and indicators. Through this exercise, common indicators that are found can reduce redundancy of projects related to WATSAN and at the same time create a larger pool of resources for projects that overlap. In addition, common indicators for multiple targets and goals will create data that can be used across targets and limit conflicting results resulting from the monitoring and evaluation process. As shown by Table 2, there are 60 SDG targets related to SDG 6. Disaggregation analysis demonstrates how to identify targets and indicators that are related. Further review of the related targets and indicators can identify subgroups to base population disaggregation for the monitoring and evaluation purposes of SDG 6.

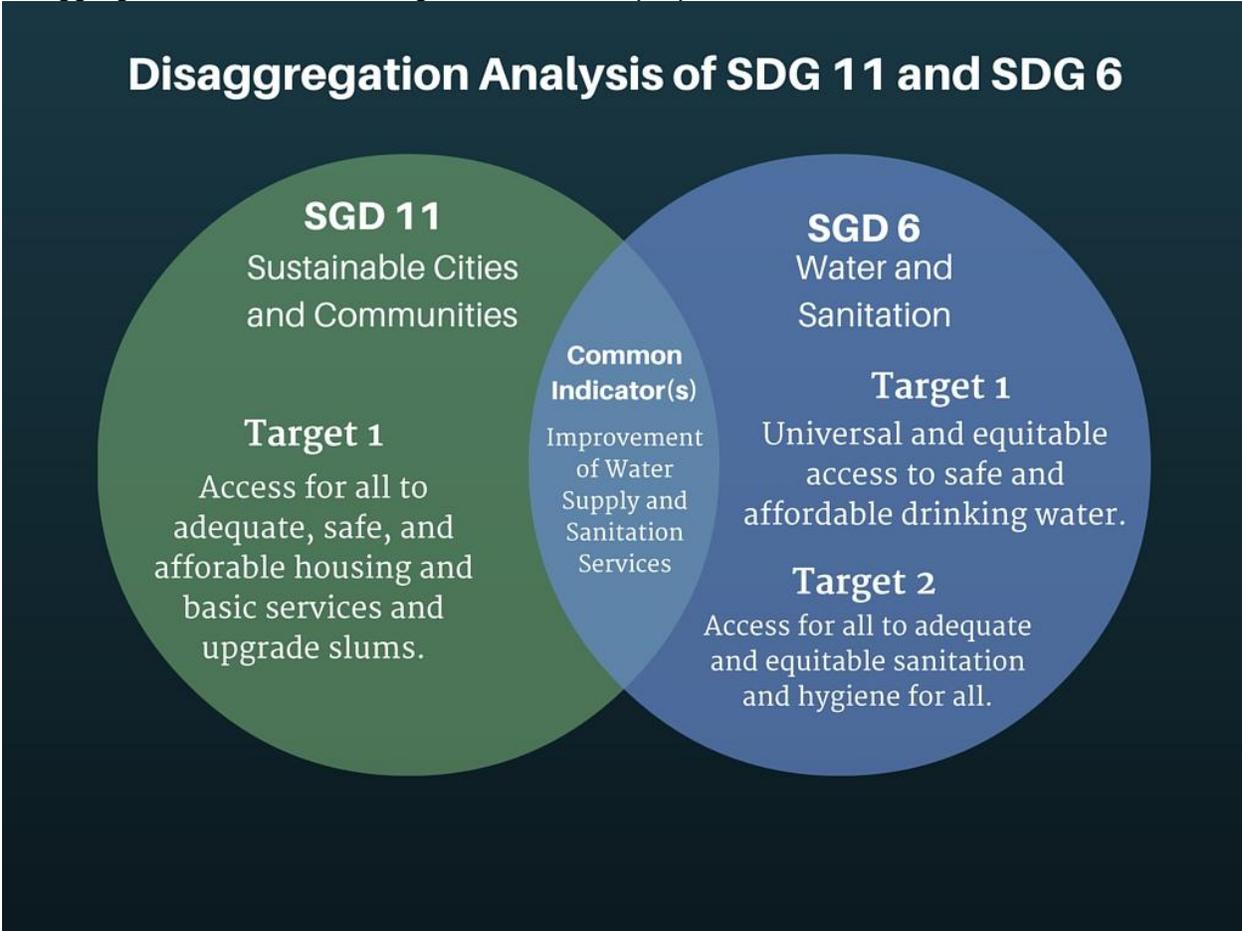


Figure 1: Disaggregation Diagram Illustrating Common Indicators Between SDG 6 and SDG 11

The similarity but not equivalency of indicators mentioned is not necessarily good or bad. As seen by Figure 2, going a step further and disaggregating the target and the indicator demonstrates a potential common metric of “Improvement of Water Supply and Sanitation Services.” Disaggregation of targets and indicators of SDGs is intended to identify possible relationships and if these relationships offer an opportunity for subnational actors to develop interventions that meet multiple indicators. It is necessary to make sure that subgroups are identified prior to the disaggregation analysis, otherwise the problem of selection bias will arise. The case study was a simpler first pass at disaggregation analysis of SDGs. The following discussion section will elucidate limitations related to this case study and topics mentioned in the previous section.

Discussion

The importance of data and the desire to have numbers drive policy in recent years has been a concern for many groups. One common concern between all stakeholders is how much is too much when it comes to data? Specifically, what is the right proportion of resources spent on M&E of the SDGs versus the proportion spent on projects and programs that contribute to the SDG’s? Along those same lines, how does M&E contribute to achieving them, particularly if data and measurements happen at the national level? Will the indicators provide the guidance necessary for subnational actors to operationalize the SDGs on the ground? For SDG 6 and others, the best chance of success comes if cities and subnational actors work to improve performance, not necessarily in comparison to each other, but in comparison to their own status from when they began. The SDGs, their targets and indicators can and will influence decisions on the ground. The data is important but decisions should have a mix of quantitative and qualitative analysis.

Disaggregation does not also mean disaggregating responsibility. In this context, we have talked about disaggregation as it pertains to population groups and the SDG targets/indicators but it should not be used to shift blame from the national to the subnational level. Nor should it be used for national governments and external organizations to rationalize more centralized or parallel mechanisms to execute interventions. Localization calls for partner countries to move away from allowing or contracting global entities to manage local projects and instead increase engagement with local governments, NGOs, and businesses. Local capacity development will often be needed, and it will be necessary to understand who is responsible and where variations are between and within countries. This will allow the creation of interventions that balance increased responsibilities, resources and support, and promote more locally determined solutions that are problem and context driven.

One of the critiques that has carried over is the lack of a definition of terms being provided. For example, in the MDGs, the word “improved” was implicitly defined as “safe.” However, the lack of this definition created ambiguity from the start as contextually the interpretation could be improved relative to a point in time or percentage of coverage. Furthermore, the lack of clarity can create indicators subject to interpretation, resulting in implemented projects with diverging aims. It is difficult to create indicators that appease all and that are completely objective. Some subjectivity is expected but the variations of interpretation should be limited through some mechanism, a glossary of sorts perhaps on the IAEG-SDG website.

Another carryover from the MDGs are the data gaps. Currently, the IAEG-SDG has done a quasi-gap-analysis with the development of a tier system. However, that is only part of the formula, which is finding where the gaps are. The follow-up question of how to fill those gaps is still to be determined. Baselines across the SDGs are suggested in order to show accurate

progress towards achieving the SDGs. The lack of consistency in data reported and the missing data will make it extremely difficult to compare and contrast progress.

Related to the gaps in data is how the data is shared. By releasing data in formats that are difficult to adapt into data mining systems, the data is harder to convert and add to a database or to visualizations. Critics of this say that the tech companies prefer the obscurity as it discourages scrutiny. How will this strategy be adopted if there is no standard for data management to follow? The ability to conduct research and understand the metadata starts from the system of record. Accessing information should not be cumbersome. It is not clear if the IAEG-SDG is the clearinghouse of data and different international agencies are the custodians of the data, presenting it, but this is a data management flaw that needs to be addressed.

The depth of the targets and indicators was not consistent for each SDG as well as between SDGs, which is the point of the tiers. The tiers themselves do not necessarily provide any clarity on how the target/indicator could be disaggregated. CDG's report looked at broad, more commonly used groupings for disaggregation of income, sex, age, race, ethnicity, migratory status, disability, and geographic location. How will marginalized groups/vulnerable populations be consistently included within data? There is nothing within the metadata that can assist in this regard.

The volume of SDG data will provide a challenge for local governments in developed countries to disaggregate on their own, let alone governments in the developing world. Questions of interpretation add another layer of difficulty to the disaggregation consideration. Organizations such as the UCLG and Sustainable Development Solutions Network, have conducted disaggregation exercises on the first iterations of the indicators utilized for the SDG 6 case study. However, issues of interpretation and association limitation still remain. What are the cost implications of disaggregated data at all levels – global, national, subnational, local? Jerven's estimate of \$254bn does not include canvassing localities or other fact-finding techniques. As of July 2017, there was no clear answer to the question regarding the methodology of data disaggregation of the SDGs. We are in year 2 of the SDGs and data is already being collected. If there is no standard, additional costs will be incurred by NSS's to not only develop but to translate interpretations of disaggregation.

Conclusions

The success of the SDGs will be determined in part at the subnational level through localization. Data disaggregation, SDG target analysis, and data collection will be important factors in the creation of an analytical framework for localizing the SDGs. The necessary assessments will differ for each SDG as some are sector specific and others are quite broad in addition to the data available at the national level. Disaggregation analysis, by population groups as well as by SDG targets can lead to efficiency gains through the development of interventions that provide a confluence of common outcomes. There are, of course, many challenges to overcome, but the opportunities for productive action are considerable.

Localization is critical for achieving the SDGs because it will encourage subnational and local governments to develop capacity and ownership of their own destiny. Moreover, localization will allow national governments as well as supranational organizations like the UN to monitor progress within subgroups in different locations utilizing disaggregated data and through which create a foundation for exchange of best practices from the ground up.

The task ahead is daunting but not insurmountable to achieve the SDGs. A coordinated effort to collect and manage the data is a step in the right direction.

Recommendations

The IAEG-SDG has begun organizing data, but there is still work to be done. Data management needs standardization and verification protocols. Standardization will allow for better comparisons. The capacity of countries as it relates to collect and manage all types of data vary. In order to increase the robustness and integrity of the data, any opportunity to mitigate human error should be taken. Reports, data collection methods, and document types, should all have a standard that participating parties follow.

Data collection, analysis, dissemination should follow a calendar as strict as possible by an independent organization that is backed by as many stakeholders as possible. There are many custodians of various data sets, but there needs to be one point of collection and one point of dissemination for all the data. The data needs to be accessible and easily understood and used by all participating parties.

The development of an analytical framework that elucidates how to disaggregate and localize the SDGs would be a valuable tool for local governments, implementing partners and others to appropriately develop projects that properly address the indicators of the SDGs and avoid duplication of efforts resulting in wasted resources.

Make sure data gaps are understood and do not hinder the achievement of SDGs. Some of the data gaps related to the MDGs had such an effect. Where possible, data gaps need to be filled. It should be noted not only what the gap was, but why, so lessons can be learned for future development projects. Where baseline data is not able to be found or accurately obtained, standard modeling protocols should be instated to normalize results. Odds are that data gaps may be similar based on region or groups so the methodology should be the same to estimate those baselines.

Citizen science and crowd-sourced data can be used as a verification tool for data. This and other data sources should be leveraged to increase the robustness and integrity of the data so that more accurate interventions can be suggested, developed and implemented. Resources earmarked for data need to be ring-fenced and used for their intended purpose. It can be very easy for subnational entities in LDC's to use funds for data for other purposes but the short-term gain will result in long-term losses.

The overall data governance strategy should encourage broader adoption by all. The value of an organization's data will only be truly realized when its constituents are given the capacity and resources to manage their own data. Moreover, they are empowered, not discouraged, to ask and answer their own questions of data that they know, understand, and trust.

Allocation of resources, capacity development and the like will all be for naught unless there is the political will and a champion for the cause. Across the globe movements, projects, etc. are sustainable when there is a solid foundation built on the political will of leadership. The political leadership should also tread lightly. Change of the status quo or going against civil servants who vehemently toe the line of, "This is how it has always been done..." can oust even the strongest of political leaders even if the policy, project or movement is for the greater good of the city, state or nation as these groups consider this a threat to their position and livelihoods.

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