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How Data-Ready are Governments to Monitor SDG Progress? An Assessment of Socioeconomic Data for SDG Planning and Reporting in Egypt, Zambia, and Zimbabwe

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How data-ready are governments to monitor SDG progress? An assessment of socioeconomic data for SDG planning and reporting in Egypt, Zambia, and Zimbabwe

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1. Introduction

In 2015 the governments of all 193 UN member states signed up to a new international development plan. The agreed plan, called *Transforming our world: the 2030 Agenda for Sustainable Development*, is a commitment by governments to eradicate poverty and inequality and protect the natural environment (United Nations, 2015). This blueprint for a better world includes 17 global economic, social, and environmental goals, known as the Sustainable Development Goals (SDGs), and 169 targets related to the goals. Like the UN Millennium Development Goals that preceded them, the SDGs are largely aspirational, as the terms of the Agenda are not legally binding on governments. However, governments have pledged to link their development policies to the SDGs and have undertaken to report regularly on their progress towards achieving the goals in their countries (United Nations, 2015, p. para 79).[2] This paper considers the SDG "data-readiness" of three African governments, that is, their ability to access local data for SDG monitoring and reporting.

After UN member governments agreed to implement the 2030 Agenda a UN-appointed expert group[3] drew up a list of indicators for each goal and its targets, as a framework to guide governments in SDG progress monitoring and reporting. There were 232 unique indicators for the SDGs at the time of this assessment (September 2018 to November 2019). The UN Statistics Division has drawn up reference metadata for each indicator to help governments who wish to align their reporting to the global indicator framework (UNSD, 2019). Table 1 gives examples of targets and indicators for SDG 1 (poverty eradication).

[2] This pledge is embodied in Goal 17 target 19: "Measure progress"
[3] The *Inter Agency Expert Group on Sustainable Development Goal Indicators*

Global indicator framework for SDG 1. End poverty

Targets	Indicators
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	1.1.1 Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, new-borns, work-injury victims and the poor and the vulnerable
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	1.4.1 Proportion of population living in households with access to basic services
	1.4.2 Proportion of total adult population with secure tenure rights to land, (a) with legally recognized documentation, and (b) who perceive their rights to land as secure, by sex and type of tenure
1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	1.b.1 Proportion of government recurrent and capital spending to sectors that disproportionately benefit women, the poor and vulnerable groups

Table 1. SDG Indicator framework: Examples from SDG 1

2016 was the first implementation year for governments to report on their progress towards the goals. SDG progress reports take the form of Voluntary National Reviews which governments can elect to present to the annual High-level Political Forum on Sustainable Development (HLPF). The Forum is the subsidiary body of the United Nations responsible for SDG follow-up and review (DESA, 2019, pp. 14, 45-47). National reviews are supposed to enable UN agencies to monitor SDG attainment at a global level and compare the pace of progress among countries. The reviews feed into the UN Secretary-General's annual SDG reports. These in turn are used by the Forum for their annual global SDG progress reviews (DSDG, 2019).

It is clear that governments will need reliable country-level socio-economic data for their SDG monitoring commitments. However, SDG indicator (SDGI) reporting will challenge official data systems in many African countries (HLGPCC, 2017, p. 1). This is evident from the failure of some African governments to assemble comprehensive data for monitoring their progress towards the much less ambitious Millennium Development Goals. Data input for MDG monitoring was patchy. For example, data on incomes and prices was relatively easy to find, but not so vital registration data, where gaps were identified in most African countries (Attaran, Amir, 2005). Recent assessments of the SDG data capacities of African governments have not been reassuring. To take one example, a

2017 UNDP assessment in Zambia showed that most of the SDGIs produced by the government were not available at the required level of disaggregation (UNDP, 2017, p. 4).

At the same time, the new agenda has put the spotlight on the need for robust data at the country level and comes with offers of international support. The 2030 Agenda stipulates that SDG planning must be evidence-based, but it also acknowledges that many government statistical systems will initially fall short of this goal (United Nations, 2015, p. 58). For this reason, SDG 17 includes a pledge by UN states to form partnerships to build SDG data capacities in member countries where necessary (SDG 17 Partnership for the Goals: Target 17.18) (UNSD, 2019). This commitment is also reiterated in the formal data capacity-building framework adopted by the UN, *The Cape Town Global Action Plan for Sustainable Development Data* (HLGPCC, 2017, pp. 1-2).[4] African governments can take advantage of this renewed focus on development data to strengthen their official data systems, and use the SDG indicator framework as a benchmark against which to measure their SDG "data-readiness" (United Nations, 2019).

Using the SDGI framework, this study reports the SDG "data-readiness" of the national statistical systems of three African governments, those of Egypt, Zambia, and Zimbabwe. These case studies consider the capacities of the three governments to provide reliable data for reporting country-level indicators of SDG progress. The assessments consider indicator availability and gaps, SDGI source data, and data exchange and reporting protocols and platforms within these country's national statistical systems. The study draws on desk research, in-field experience, and analysis of data collected during UN-sponsored statistical capacity assessments carried out in 2018.

These investigations indicate that current closed data governance models in African national statistical systems can hamper the delivery of policy data to African policymakers who need this data to tackle development challenges such as poverty and inequality. Exploring SDGI reporting capacities and methods in African countries could reveal the inadequacies of current data governance models and suggest ways to adapt them. Based on findings from the SDG data-readiness assessments, this study makes recommendations from the field of Data Science for more effective information governance models for the production and dissemination of SDG indicators and their source data. It suggests more open information models to free up data across agencies and to build a strong research-policy interface in each country (IEAG, 2014, pp. 6, 13, 22-24, 65).

[4] The Cape Town Global Action Plan for Sustainable Development Data originated from a UN World Data Forum held in Cape Town South Africa, in January 2017. The plan was adopted as an SDG data capacity-building framework by the United Nations Statistical Commission at its 48th Session in March 2017.

The problem of the impact of governance of national data on SDG planning is a worthy topic for research because it has social impacts. Such research could provide governments with tools to measure their development data capacities and suggest ways for them to deliver socioeconomic data to policy researchers for input to more targeted policies to attain the SDGs.

2. SDG Data-readiness Assessment Methodology

In this study, the SDG data-readiness of governments is measured by the number of SDG indicators that they are able to report on for their countries using official data sources. The Cape Town Global Action Plan for Sustainable Development Data recommends that once governments compile values for their national SDG indicators these should be made available "through transparent and public access (HLGPCC, 2017, p. 2)". A further measure of SDG data-readiness is therefore the extent to which SDGIs and their source data are publicly accessible. UN agencies also publish country-level indicators because they have a mandate to report global progress towards the goals (United Nations, 2019). However, some of the country-level indicators posted on UN sites do not draw on data from official sources. Because this study is an assessment of national SDG data-capacities, UN-reported indicators for our study countries were only counted if the indicator values were based on official in-country sources.

2.1 Document and Website Reviews

Data collection for the study involved examining SDG indicator reporting mechanisms, including the Voluntary National Reviews of each government. The Egyptian government presented Voluntary National Reviews to the UN High-Level Forum in 2016 and 2018. Zimbabwe's government reported a formal Voluntary National Review in 2017 and has committed to a follow-up review in 2020. The government of Zambia will present their first review in the 2020 review round (UN-DESA, 2019).

Governments also report their SDGIs on online data platforms[5] which are often managed by national statistics agencies and other key agencies such as health ministries. Governments need such technology to efficiently store and exchange data, including their indicators of SDG progress (EFNASH, 2012, p. 5). This type of information infrastructure can deliver data to what Parkhurst calls "the evidence advisory system", that is, the norms and structures that determine what data gets used in policy planning and monitoring (Parkhurst, 2017, p. 132). This assessment includes a review of

[5] A data platform is IT infrastructure used to curate and disseminate data and related documents as well as explanatory metadata (UNSD-DESA, 2019).

platforms for disseminating SDGIs and their source data. Source data was defined as either statistical (censuses or sample surveys) or administrative (administrative records).

The UN Statistics Division's has defined core principles and guideline for the type of data platforms governments should build to disseminate their SDG indicators. These principles are (i) clear institutional arrangements and management (ii) fitness for purpose (iii) interoperability and adherence to statistical standards, and (iv) sustainability (UNSD-DESA, 2019). The guidelines for application of the UNSD principles recommend that governments adopt an open data governance framework for the management of official data. The Cape Town plan also recommends that governments employ open data strategies when reporting their indicators and other data (HLGPCC, 2017, p. 4).

According to the literature, the concept of "open" when applied to information has both technological and philosophical dimensions. Technologically, "open" means using digital technologies to manage and share information more efficiently and equitably. Philosophically, "open" means transparent, participatory and collaborative (Yu, 2012, p. 189). Technological openness enables governments to build interoperable data exchange systems. Philosophical openness ensures collaborative data production and builds trust in official data. Core open data principles include a*ccessibility* (data must be free, online in non-proprietary formats); *primacy* (data must be disaggregated by all useful dimensions); *Timeliness;* and i*nterpretability* (data must be shared with explanatory metadata). These principles reflect key data quality attributes and have been endorsed by national and local governments (Lessig, 2007) (Open Data Charter, 2015). The UNSD principles and open data principles provide a framework for the assessment of government platforms for sharing SDGIs and their source data in Egypt, Zambia, and Zimbabwe.

2.2 In-Country Assessments

In the case of Zambia and Zimbabwe, substantive data was also collected during in-country SDGI monitoring assessments undertaken for the *UNSD-DFID Project on SDG Monitoring*. Launched in 2017, the Project is a DFID[6]-funded initiative of the UN Statistics Division to assist governments of 20 countries in Africa[7] and Asia to compile values for country-level SDG indicators, and to ensure these indicator values are widely available (UNSD, 2019). The on-site SDG data-readiness assessments took place in September (Zimbabwe) and October (Zambia) 2018. The assessment team included UNSD staff and consultants (including the author) who held meetings with key informants in national statistics agencies and other agencies within their national statistical systems.

[6] UK Department for International Development
[7] Project countries in African were Burundi, Ethiopia, Ghana, Liberia, Mozambique, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe

To identify which indicators were already compiled, before the in-country meetings statistics agency staff were sent the list of indicators and asked to report on those for which they were able to provide reliable data points. The face-to-face meetings were meant to confirm or correct this information, and gather information on data gaps and other data-related obstacles to SDG progress monitoring. The meetings also identified the agency primarily responsible for collecting source data and for SDGI reporting.

The on-site assessments (in Zambia and Zimbabwe) employed a methodology developed by the UN Statistics Division[8] to measure the capacity of governments to report on SDG indicators for their countries. The latest global SDG indicator framework was used for this investigation. The framework includes 232 unique SDG indicators (UNSD, 2019)[9]. Indicators deemed not applicable for the country context were not included in final counts[10]. The assessment considered whether data was available within the national statistical system to provide country-level values for SDG indicators, as well as the feasibility of the indicator value being computed within five years. SDGI assessment categories were:

1. The indicator has been compiled (including at the required level of disaggregation)
2. The indicator is easy to compile in the short term (3-5 years)
3. The indicator could be compiled with effort (with more funding and technical support)
4. The indicator cannot be compiled for the country (data is unavailable and unlikely to be available in the next 5 years)

Analysis of the above indicator information was used as a guide to the government's *SDG data capacity*. For the purposes of the assessment, *SDG data capacity* was defined as the sum of indicators already assigned values and those that were reported as easy to assign values in the short term, meaning the source data is available or will be available within 3-5 years. The assessments also reported on indicators which agencies claimed could be compiled with effort. Effort was defined as changes in data collection or collation which would require extra funding and technical support from UN agencies or other donors. This could include, for example, resources to add questions to current survey data collection instruments to collect data needed to compile missing indicator values.

Egypt is not a DFID-UNSD Project country and therefore data collection to assess the Egyptian government's SDG data-readiness did not include an on-site evaluation. Rather, it comprised

[8] The methodology was designed by Vladimir Markhonko, Statistical Consultant, UNSD, and used with permission

[9] The official indicator list confirmed by the 48th session of the UN Statistical Commission in 2017 (UNSD, 2019).

[10] For example, Zambia and Zimbabwe are both land-locked countries, and therefore goals related to marine conservation (SDG 14) do not apply to them. In other cases, indicators may refer to measures to be compiled by UN agencies, e.g. those related to international partnerships for SDG attainment

document and website reviews to determine the number of indicators reported by the government as available and identifying which of these are published online, and their source data.

A note on comparability of findings must be added here: UN agencies often attempt cross-country comparisons from capacity-assessments of individual governments. However, this is perhaps not the best use of the findings from local SDG data audits. Each government situation is different, and a "one-size-fits-all" approach may obscure local realities that impact on policy data systems. The assessment methods adopted by the UNSD also do not allow for rigorous cross-country comparisons. This is because, firstly, not all of the 232 indicators in the framework will be applicable to all countries. For example, indicators for SDG 14 (ocean conservation) are not relevant to land-locked countries like Zambia and Zimbabwe. Secondly, some indicators require more than one data point, and therefore it is not always possible to map indicator values neatly to indicators. For example, SDG indicator 4.1.1 is the proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex. A number of values are required in order to report on this indicator and governments report on these indicators in diverse ways.

Finally, while official conceptualisation of and methodologies for most of the indicators are clear (the so-called "Tier 1" and "Tier 2" indicators), in 2018 62 of the indicators still lacked clear definitions or compilation methodologies (the "Tier 3" indicators) (UNSD, 2019). Tier 3 indicators are thus open to varied interpretation and the in-country assessments showed that government agencies often defined Tier 3 indicators differently. Rather than lose this information, though, it was decided to report on these indicators in the final assessment. Thus the assessment outcomes for these indicators may not be directly comparable across countries. These comparability concerns mean the SDGI data-readiness assessment findings may be more useful as country case-studies rather than as comparative capacity measures. The recommendations, however are applicable to national statistical systems in all three countries, and may be pertinent to other countries in the region.

3. Assessment Findings: SDG Data-Readiness in Egypt

This section summarises the results of an investigation of the capacity of the government of Egypt to monitor their SDG progress using national data. The findings are based on document and website reviews to determine SDG indicator availability for the country.

3.1 Compiled SDG Indicators: Egypt

In 2016 the Egyptian government reported in their Voluntary National Review that they were able to report values for 41% of the SDG indicators for the country. By 2018, as reported in the subsequent VNR, the government had data points for 106 indicators (45%) at the country level. The 2018 VNR lists 13 (5%) indicators as not applicable in the Egyptian context. Table 2 shows the Egyptian government's self-reported SDG data capacity (Arab Republic of Egypt, 2018, p. 64). The 2018 figures have been calculated on a total indicator count of 244. However, 9 indicators repeat under two or three different targets and therefore the total number of unique indicators in the framework is actually 232 (UNSD, 2019). However, there is no way to identify which indicators are double-counted, so the counts are as reported. As shown, the figure of 45% of compiled indicators is close to the 43% reported in 2018 by the Central Agency for Public Mobilization and Statistics (CAPMAS) Egypt's statistics agency (CAPMAS, 2018).

CAPMAS also reports a 5% count of not-applicable indicators, which confirms the VNR figure. Keeping the total applicable indicators as 244 and excluding not-applicable indicators, 55% of indicators are shown as not yet reported, which is close to the 52% unavailable indicators reported by CAPMAS in the same year (CAPMAS, 2018). The government has defined 330 local key performance indicators for achieving Vision 2030. Some of the indicators reported in their 2018 VNR do not match those in the global indicator framework, which complies with reporting standards (Arab Republic of Egypt, 2018, p. 15). There is no requirement for governments to align their national indicator frameworks precisely with the international framework, as governments are able to adapt elements of the indicators to suit local conditions. Thus adapted indicators reported for Egypt are included in the final count of compiled indicators.

SDG Indicators already compiled for Egypt 2018	*Number of indicators*	*% of applicable indicators*
All SDG indicators (including indicators that repeat for some targets)	244*	
Not applicable	13	5%
Applicable	231	100%
Indicators already compiled	**106**	**45%**
Indicators not yet compiled	125	55%
***SDGI data-readiness** (compiled applicable indicators)*	**106**	**45%**

Table 2. SDG Indicators compiled for Egypt 2018

*****Numbers are based on the total of 244 non-unique indicators, to cater for double-counting in the indicators reported on in the 2018. Thus these calculations are not directly comparable with SDG data-readiness figures for Zambia and Zimbabwe

3.2. Source Data for SDG Indicators in Egypt

Figure 1 shows the source data (statistical or administrative or a mix of both data types) for those indicators that were reported as compiled in 2018. Source data could only be identified for those indicators which were available online and which included citations to underlying data sources.

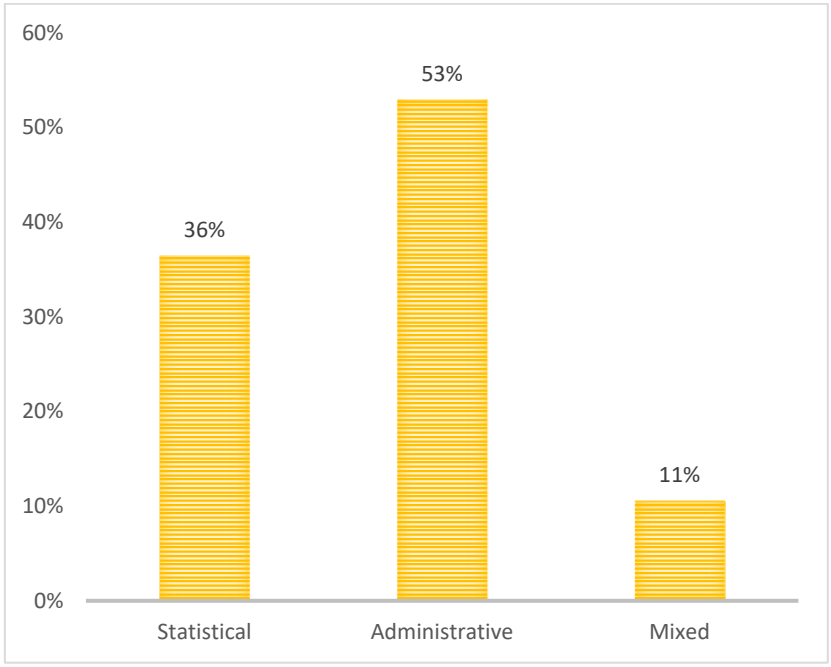

Figure 1. Source data for SDG indicators in Egypt (2018)

Statistical sources include the population censuses conducted by CAPMAS every ten years and also regular surveys such as the Labor Force Survey. Source data also originates from other agencies which conduct special-interest surveys, for example, the Information and Decision Support Center of the Egyptian Cabinet of Ministers runs a Survey of Young People in Egypt.

Administrative sources include data from agencies within the national statistical system. CAPMAS partners with some of these agencies to compile and publish administrative data. For example, CAPMAS produces energy statistics in consultation with the Ministry of Petroleum and the Egyptian Environmental Affairs Agency, and the Ministry of Tourism shares tourism statistics with the Agency. Egyptian government agencies also collate administrative databases independently, such as health information management system of the Ministry of Health (Arab Republic of Egypt, 2018, pp. 11-12). As in most country, though, administrative databases are not set up for efficient data exchange and reuse. An assessment of Egypt's national statistical system by a team from PARIS21[11] in 2015 found that statistics were used extensively for policymaking in Egypt, but that the government could make better use of administrative data as a cost-effective policy evidence-base. Limited cross-agency access to administrative databases were also identified as a challenge in using administrative data for SDG monitoring (PARIS21, 2015, p. 19).

3.3 Platforms for SDG Indicators and Source Data in Egypt

This section considers which of the indicators compiled for Egypt are publicly available, as stipulated by *The Cape Town Action Plan*, and how they are disseminated. Figure 2 shows how indicators compiled by the Egyptian government are currently disseminated. The figure also shows that 17% of indicators are available offline. This is based on an online search for indicators reported in the VNR as already compiled for the country. Those indicators that were reported as compiled but could not be located online were listed as available offline.

[11] The Partnership in Statistics for Development in the 21st Century (PARIS21) was launched by the United Nations, the European Commission, and the Organisation for Economic Co-operation and Development (OECD) in 1999 to support statistical systems in low and lower-middle income countries (PARIS21, 2019).

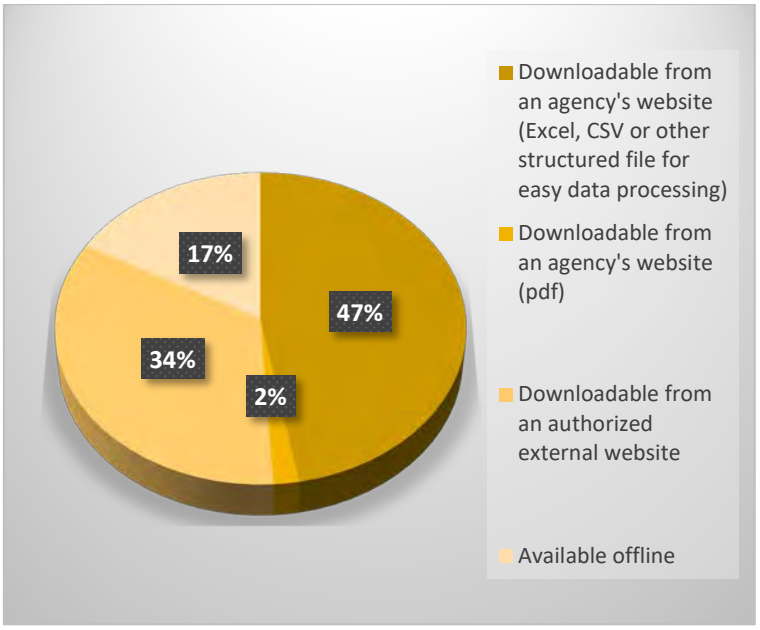

Figure 2. Egyptian SDGIs by mode of dissemination (*% of the total)*

The Egyptian government's current sustainable development policy is their *Sustainable Development Strategy: Egypt's Vision 2030*, launched in 2016, which focuses on integrating sustainability into national development priorities (Arab Republic of Egypt, 2016, p. 48). Institutional arrangements for SDG monitoring centre on CAPMAS, who are expected to report many of the indicators related to SDG progress in the country, and liaise with other agencies within the national statistical system to obtain indicator data.

Aggregated Data Platforms

CAPMAStat is the dissemination platform adopted by CAPMAS for sharing aggregated statistics. The data site is built on the DevInfo database software originally developed by UNICEF from their ChildInfo software and extended as a tool to access and monitor data on human development. The site is not interoperable with CAPMAS' indicator or microdata web-based platforms.

SDG Indicator Platforms

CAPMAS' site for disseminating SDG indicators, the Egypt SDG Observatory is also built on the DevInfo software. The site has an attractive, uncluttered design and is easy to use. However, some published indicator values are missing citations to the source data, so it is difficult to confirm whether all the published indicators are produced by official government agencies. The data on the SDG Observatory is sometimes outdated, for example, in November 2019 the latest unemployment rate data on the Observatory was for 2016, while more recent (2017) data was cited in the 2018 VNR

published online at that time. In this instance, it seems that database administrators are not using the real-time update advantage of digital platforms (CAPMAS, 2019).

Challenges related to maintaining and updating dissemination sites include the short-term nature of UN data support. For example, the DevInfo software is no longer supported by UNICEF (DevInfo, 2018). However, if agencies wish to use existing technologies for SDGI reporting they should be given the necessary support from UN agencies. The lack of sustainability of data infrastructure support and the introduction of competing rather than complementary tools for data management by different UN agencies presents a challenge for government staff in many countries in the region who must be retrained to use new software.

Microdata[12] Platforms

CAPMAS has also installed the World-Bank developed National Data Archive (NADA) web-platform for sharing microdata and metadata online. NADA has interoperable and extensible components, and supports the creation of standards-compliant metadata. CAPMAS uses the NADA to disseminate metadata for an amazing 1233 datasets produced by the agency since 1967 (CAPMAS, 2019). The agency does not use the NADA site to disseminate microdata, but has an institutional microdata-sharing arrangement with the Cairo-based Economic Research Forum (ERF). ERF is a research network which supports data-intensive economic research in countries in the Middle East and North Africa. ERF shares microdata from CAPMAS surveys from their own NADA instance. Researchers can register on the ERF site and request datasets, and receive an email notification to download the data once their data request is approved, which takes a couple of days.

Online access to microdata supports agencies within the national statistical service to report cross-cutting indicators. It also ensures data is available at the required level of disaggregation for indicator reporting. 50 of the 232 SDG indicators in the framework must be reported at some level of disaggregation, as depicted in Table 3.

[12] The UN Statistical Commission defines microdata as data collected on an individual object or statistical unit, for example, a person, household or firm (UNSC, 2000).

SDG Indicators - Required Disaggregation

Variable	Frequency
Sex	28
Age	21
Disability-status	10
Employment-status	3
Location (place)	3
Location (rural-urban)	2
Migrant-status	2
Population-group	2
Tenure-type	2
Indigenous status	2
Other[13]	27

Table 3. Disaggregation requirements for SDGIs

However, several African governments do not yet report key indicators disaggregated according to the global SDG indicator framework. One problem is that key disaggregation variables, such as disability status, may not have been collected in past surveys. Even where the data has been collected, though, it may not be readily available for indicator construction. Poor data communication across agencies may mean ministries are not aware of all public-sector data holdings.

This has led for calls to support the publishing of government-held data at the level of microdata[14] to provide cross-agency access to data that is useful for constructing indicators of development progress. For example, the UN's SDG data capacity-building framework includes support for policies to increase access to anonymised microdata to enable governments to monitor and report on the SDGs (HLGPCC, 2017, p. 7). Data at this level can be used to investigate socio-economic realities on the ground, as well as to scrutinise the accuracy of published indicators. Because of the institutional arrangement between CAPMAS and ERF, the CAPMAS scores well in terms of data accessibility, primacy, and interpretability.

[13] Cause of death, classes of farming, enterprise size, ecosystem type, form of exploitation, heritage type, government level, expenditure type, type of private funding, internet speed, key populations, malnutrition type, type of mobile technology, mode of transport, occupation, pregnancy status, work-injury victim status, the poor, provider of development cooperation, revenue source, sector, type of study, size of city, skill type, source of funding, type of hazardous waste treatment, type of science/technology cooperation agreement.

[14] The UN Statistical Commission defines microdata as data collected on an individual object or statistical unit, for example, a person, household or firm (UNSC, 2000).

4. Assessment Findings: SDGI Data Readiness in Zambia

This section summarises the results of the 2018 assessment in Zambia, which considers already compiled indicators and indicator data gaps. Unlike the Egypt assessment, however, the data-readiness assessment for Zambia (and Zimbabwe) also investigates un-compiled indicators for which data exists, or will exist in 3-5 years, and includes these in the measure of SDGI data-readiness. This is because during the in-country meetings in both countries the team discovered that many of the indicators reported as available were not at the required level of disaggregation. The remit of the team was to consider indicators that were available and disaggregated, and indicators not disaggregated accordingly were not counted as compiled for the country.[15] So the scores for already-compiled indicators are very low. However, the team were also informed that easy-to compile indicators were mostly those that could be further disaggregated with relative ease, and therefore these easy-to-compile indicators were included in final counts. This decision, coupled with not being able to confirm the disaggregation levels of the indicators reported for Egypt, means data-readiness measures are not directly comparable between SDG indicator availability in Egypt and their availability in the other two countries.

4.1 Compiled or Easily Compiled SDG Indicators: Zambia

Table 4 depicts the percentage of already-compiled indicators and those reported to be easy to compile within 3-5 years, and sums these as a measure of the SDG data-readiness of the Zambian government. In 2018 the Zambian government was only able to report on 13% of applicable indicators. However, according to agencies, data was available to compile 25% of the outstanding indicators, including for further disaggregation of already-compiled indicators. By this measure, the SDGI reporting capacity of the Zambia government is 38% of applicable indicators. The table also shows the number of indicators which could be compiled for each country if additional external support (funding and technical training) was made available to the government for this endeavour. These capacity improvement scores are based on information provided by agencies during in-country meetings.

[15] Governments could choose to report on a localised version of an indicator, adapted to country conditions, but these customised indicators must still be reported disaggregated according to the SDG indicator framework.

SDG Data Readiness - Zambia	*Number of indicators*	*% of applicable indicators*
All unique SDG indicators	232	
Not applicable	29	
Applicable	203	100%
Compiled indicators	**27**	**13%**
Indicators reported as easy to compile	**51**	**25%**
Indicators which could be compiled with effort	**108**	53%
Indicators not able to be reported	**17**	8%
SDGI data-readiness *(sum of currently available indicators and those reported as easy to compile)*	**78**	**38%**

Table 4. SDG data-readiness of the Government of Zambia

4.2 Source Data for SDG Indicators in Zambia

Figure 3 reports the source data used by Zambian government agencies to compile existing SDG indicator values as well as for indicator reporting in the near future. Zambian agencies report using more statistical data (censuses and surveys) than administrative data to compile values for their SDG indicators (47% and 37% of their indicators, respectively). Agencies draw on both data sources for values for 15% of their indicators.

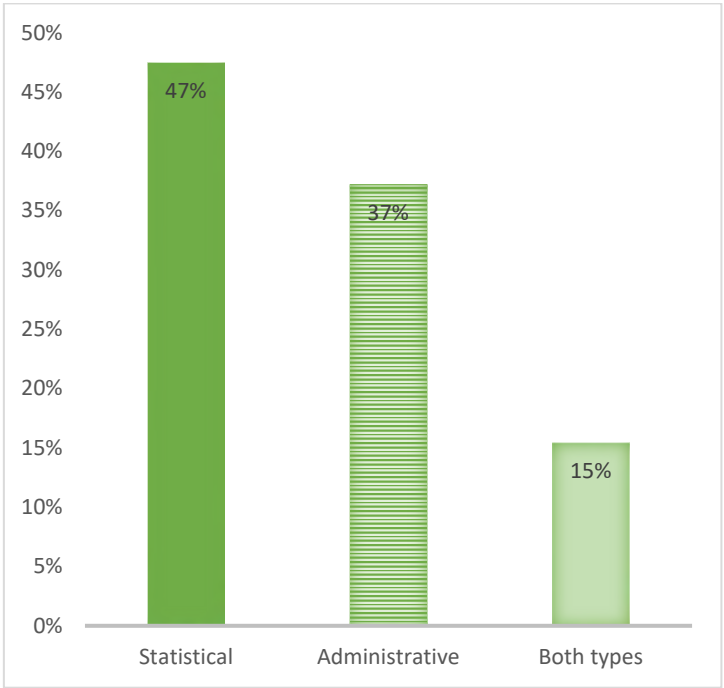

Figure 3. Zambia: Reported and easy SDGIs – by data source (% of total)

Statistical data used to compile values for SDG indicators include a 10-yearly Census of Population and Housing conducted by the Zambia Statistics Agency (ZSA, formerly the Central Statistical Office) (CSO, 2019), as well as regular sample surveys, sometimes conducted by the NSA in partnership with other agencies. Other government agencies also draw on their own surveys for indicators, for example the Ministry of General Education holds data from their Annual Schools Census and three-yearly National Assessments. To construct indicators, the statistics agency also draws heavily on their Living Conditions Monitoring Survey and Quarterly Labour Force Survey. The Zambia Statistics Agency has also initiated new surveys to gather SDG related data, such as the National Disability Survey, begun in 2015.

Government agencies also make use of administrative data for SDGI reporting. Several Zambian line ministries have well-developed administrative data systems, for example, the Ministry of Agriculture has a District Profiles System. Within the Ministry Home Affairs, the Department of National Registration, Passport and Citizenship (DNRPC) maintains a vital registration database with data quality support from demographers at the national statistics agency. Within the Zambian NSS some agencies have data exchange protocols for administrative data, for example, the DNRPC and the Department of Health, for sharing vital registration data.

However, data exchange among government agencies is mostly informal and on-demand. Administrative data is shared in hard copy or pdf files or excel spreadsheets. Survey reports are provided to stakeholders on CD. UN agencies over the years have helped install data dissemination platforms in Zambian ministries, although none of these are designed to be interoperable across ministries. A government needs assessment carried out in 2014 for the Zambian *National Strategy for the Development of Statistics* showed that even ministries with well-established sector management information systems were operating these in isolation, with no coordination with MIS in other ministries (Government of the Republic of Zambia, 2014).

4.3 Platforms for SDG Indicators and Source Data in Zambia

The SDGI data-readiness assessment also considered how indicators and their underlying data are disseminated. The team investigated how already-compiled indicators are shared by the agencies. Figure 4 shows the sharing modes for currently-compiled indicators in Zambia. The figures show that, while most indicators compiled for Zambia were available online (78%), some indicators (22%) were only available in offline databases. Indicators disseminated on websites or in offline sources are mainly those from statistical sources.

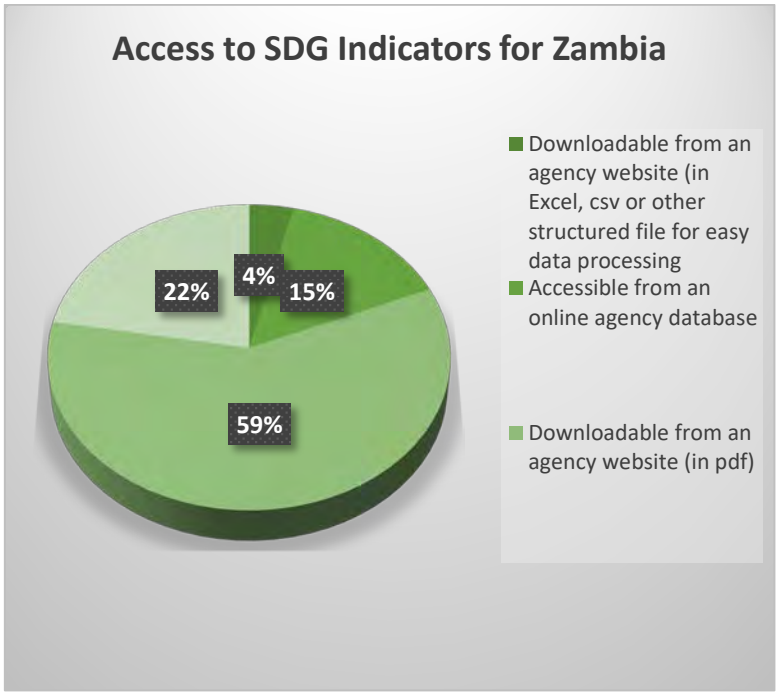

Figure 4. Zambian SDGIs by mode of dissemination (*% of the total)*

The DFID-UNSD Project focused on SDG indicator accessibility because accessibility is a cornerstone data quality attribute. This is because accessibility can lead to improvements in other dimensions of data quality (Woolfrey, 2013, pp. 18-19). This happens through the due diligence to data preparation necessary when data is to be shared. It is also because quality feedback from data users beyond government can improve the accuracy and reliability of data, in the scientific self-corrective model (Houghton, 2010, p. 28). However, data collected during the in-country assessment can be used to assess other attributes of data platforms. The assessment adopts the UNSD indicator platform principles and open data principles as a review framework.

Aggregated Data and SDG Indicator Platforms

Indicators which are accessible from online databases come from administrative and statistical data sources. Figure 4 shows that 15% of currently available indicators can be accessed this way. The statistics agency disseminates aggregated data and indicators via their Zambia Information Highway (ZIH) site. This platform is an instance of the *Africa Information Highway* (AIH) software developed by contractors at the behest of the African Development Bank. Some visualisation is provided, and data can be downloaded, sometimes as excel files, other times in a pdf document. The AIH site has a module for reporting SDG indictors which is still being populated. In-country data sources listed on

the site are the Bank of Zambia, the Ministries of Education and of Gender, and Zambia Statistics Agency (40 of the 43 datasets).

There seem to be issues around institutional management of the SDGI site with regard to managing metadata content. Metadata for many of the indicator values listed on the site relates to the international standard indicator-construction methodology rather than to the methods used on the ground at Zambian agencies. The ZIH site also includes several outdated time-series. For example, the GDP data published in 2018 was for 2014. Data on the site also needs more comprehensive metadata to ensure stakeholders can interpret the data. Resource and time constraints at the statistics agency may hamper regular updates of these sites. But it is more likely that inadequate indicator reporting stems from the fact that the platform is a generic one designed and managed by consultants with minimal involvement from the national statistics agency and other Zambian agencies. The core role that the private consulting firm plays in site maintenance may also compromise the sustainability of this platform and jeopardise the accessibility of Zambia's reported SDGIs in the future.

The ministries of Agriculture, Commerce, Trade and Industry, and Livestock and Fisheries, as well as the Zambia Agricultural Research Institute have set up a Zambia CountryStat site are using an instance of the CountryStat application developed by the FAO (FAO, 2019). However, most of the data on the site is production data and the SDG indicator module has not yet been populated with country-level indicator values.

Online data dissemination platforms used within the Zambian NSS are not interoperable, and do not support large-scale downloads, and inter-agency data exchange is largely offline. For example, the Ministry of Agriculture has a District Profiles System which is on an intranet and not accessible across agencies. The Ministry of Gender maintains a Gender Based Violence MIS which covers 30 districts but data is manually entered into the database and the ministry generates pdf reports from the data and provides data to the WHO in Excel. The Ministry of General Education has an Education MIS but the data is not publicly available and is only published as tables in an Education Bulletin.

Microdata Dissemination Platforms

Zambia Statistics Agency installed a NADA microdata dissemination site in 2009 but this platform is no longer maintained, and the site is not live. ZSA staff stated that would need further training to administer the platform. It is unfortunate that the CSO is not maintaining this site, as this could provide easy access for all government agencies to well-documented disaggregated data to support the compilation of national-level SDG indicators. Online exchange of government data, including indicator values could facilitate indicator compilation and reporting in the country.

5. Assessment Findings: SDGI Data Readiness in Zimbabwe

This section summarises the results of the 2018 SDGI data-readiness assessment in Zimbabwe. As noted, data-readiness to monitor and report on SDGs in Zimbabwe (and Zambia) incorporates indicators yet to be compiled, but for which compilation data exists.

5.1 Compiled and Easy to Compile SDG Indicators: Zimbabwe

Using the same methodology as in the Zambia study, the data-readiness of the Government of Zimbabwe stands at 42% of applicable indicators, counting indicators already compiled for the country (14%) and those for which data exists, including data for further disaggregation (28%). Table 5 summarises these findings.

SDG Data Readiness – Zimbabwe	***Number of indicators***	***% of applicable indicators***
All unique SDG indicators	232	
Not applicable	29	
Applicable	203	100%
Compiled indicators	**28**	**14%**
Indicators reported as easy to compile	**57**	**28%**
Indicators which can be compiled with effort	**104**	51%
Indicators not able to be reported	**14**	7%
SDGI data-readiness *(sum of currently available* indicators and those reported as easy to compile*)*	**85**	**42%**

Table 5. SDG data-readiness of the Government of Zimbabwe

5.2 Source Data for SDG Indicators in Zimbabwe

While Zambian government agencies reported using statistical data more than administrative data to compile their indicators, in Zimbabwe administrative sources are used much more than statistical data for this purpose (for 64% and 32% of indicators, respectively). Only 5% of indicators for Zimbabwe are drawn from both data sources. Figure 5 reports on data sources for indicator values in Zimbabwe. The Zimbabwean Statistics Agency (Zimstat) and other agencies use administrative data because it has many advantages including low cost, better coverage of many social phenomena and provision of

quite detailed data disaggregation. The main limitations of the administrative data raised at the meetings were the fragmentation of the data, lack of clear mapping to the statistical concepts and classifications, and difficulty of obtaining cross-agency access.

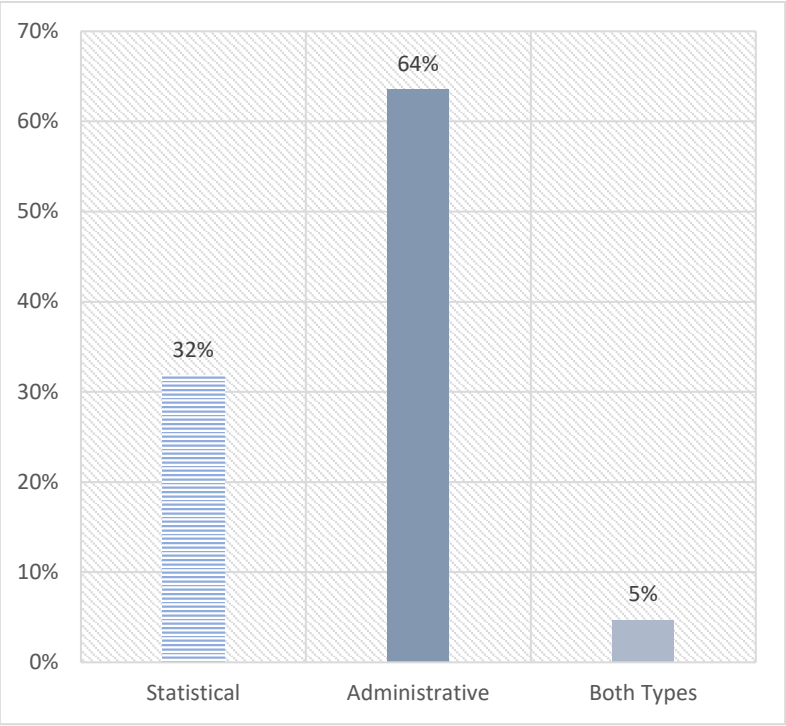

Figure 5. Zimbabwe: Reported and easy SDGIs – by data source (% of total)

5.3 Platforms for SDG Indicators and Source Data in Zimbabwe

This section considers how indicators and their source data are disseminated by Zimbabwe's national statistical system and includes a critique of websites used for disseminating this information. The assessment framework is again based on the UNSD indicator platform principles/open data principles. Figure 6 reports the means of dissemination of SDG indicators, as reported at the Zimbabwe meetings. The figure shows that, while most existing indicators (89%) were published online, a few (11%) were only available in offline databases. The high percentage of Zimbabwe's indicators available from a website other than an official government site reflects the extensive use within the national statistical system of the DHS and MICS data for indicator reporting, as well as the fact that the government's health-related indicators are published by the WHO. It is important to note though, that these figures refer only to currently compiled indicators, which are a small percentage of total applicable indicators (14%).

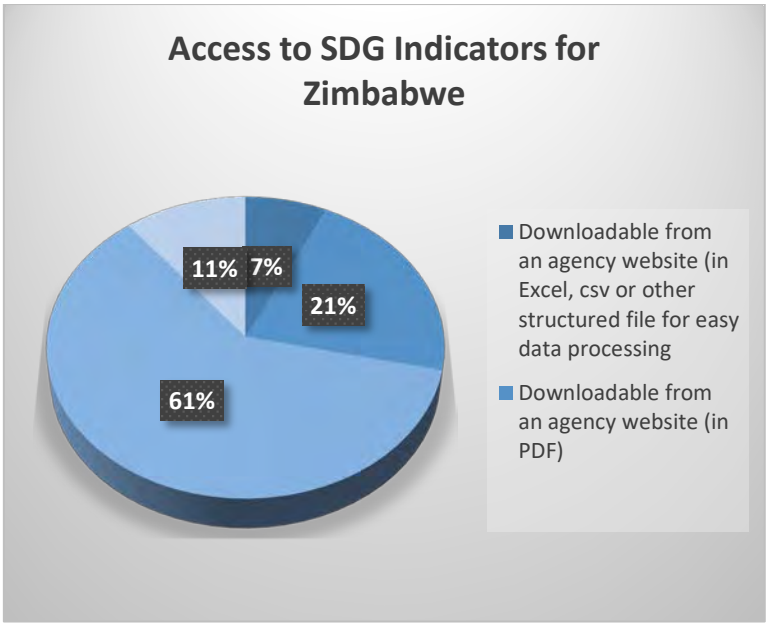

Figure 6. Zimbabwean SDGIs by mode of dissemination (*% of the total)*

Aggregated data and SDG indicator dissemination platforms

Like Zambia Statistics Agency, Zimstat is using a generic AIH data site designed and managed by consultants contracted by the African Development Bank (AfDB) which has a dedicated SDGI module, but this has not yet been populated with indicators. Some of the datasets published on the site do provide indicator data points, though. The AIH site is also strong on visualization and weak on data citation. Datasets are mainly time-series data. Data downloads are in excel or pdf reports and require registration. As with the Zambian AIH site, data sources listed on the Zimstat site include those outside the country, such as the AfDB and the UNSD.

Institutional management issues with the platform relate firstly to the lack autonomy of Zimstat to manage the site and upload indicators. Secondly, there are no formal documented data exchange protocols between reporting agencies and Zimstat staff, or between Zimstat and the consultants who manage the site from a central location. The current procedure is that compiled values for indicators are passed on to Zimstat IT staff by reporting agencies, and IT staff share this information with the AfDB consultants on Excel spreadsheets, and data is generally exchanged on demand rather than according to any formal reporting calendar. Zimstat's AIH data portal does not include standardised data descriptions. Data citations refer back to the Zimstat homepage rather than to data download pages. There is also an issue around data timeliness. 56 indicators more recent than 2010[16] are published on Zimstat's AIH site. Table 6 shows the reference dates for these indicators at the time of the data-readiness assessment (2018). These are not necessarily SDG-compliant indicators, but all

[16] Data posted for earlier than 2011 were not counted here.

indicators available on the site. The data reference dates show that most of the indicators available on the national site are not recent.

Zimstat data portal - Timeliness

Reference date	*Number*
2012	*1*
2014	*46*
2016	*2*
2017	*3*
2018	*1*
2019	*3*
	56

Table 6. Zimbabwe: Reference dates of published indicators 2018

Many of the indicators from 2014 are health-related, and from the meetings it was clear that the Ministry of health has more recent data. The time-lag to get the data online might relate to poor inter-agency coordination around data. Because very little data from agencies is published online, knowledge of data sources tends to be siloed: Staff tended to be knowledgeable on data sources for their area of expertise but could not provide accurate information on data products outside the immediate scope of their work. This was even more evident for civil society organisations who participated in the meetings, who tended to be out of the data loop. Recent elections in the country (30 July 2018) leading to changes in ministries and breaks in programme continuity have also weakened the cross-agency knowledge-base.

Microdata platforms

Zimstat also has a NADA-based microdata dissemination site which was installed at the agency in 2015[17]. The site is still live and lists 12 survey datasets. But only 2 datasets have downloadable data[18]. Thus, currently, models of limited access are in place for census and survey data held by Zimbabwean agencies. Challenges around such models is that they can result in less useful data, firstly, because closed models do not enable the creation of interoperable data access systems. Secondly the data is less usable because it hasn't been circulated and assessed widely enough to be regarded as trustworthy.

[17] The author was one of the consultants responsible for the World Bank sponsored training and software installation

[18] Attempts were made to download the data from all 12 datasets on 4 October 2019.

An example from Zimbabwe's 2017 Voluntary National Review gives some weight to this assertion[19]. Looking at the review, it becomes apparent that 30 of the 34 data graphs in the VNR cite data that is available online (Government of Zimbabwe, 2017). Thus, while most Zimbabwean government microdata is not shared openly, the data they report from is. Ease of access leading to greater trust in the data may play a role in this decision. Possibly Zimstat and other agencies trust this data also because a great deal of funding and effort is put into its collection and collation, with the knowledge that it will be distributed and examined widely. Their choice seems to lend credence to the view that open information models benefit governments in terms of higher quality (more usable) country data.

6. Assessment of Potential SDG Data Capacity in Zambia and Zimbabwe

Agencies in Zambia and Zimbabwe reported that about a quarter of missing indicators could be easily compiled within 5 years, based on existing data (25% for Zambia, 28% for Zimbabwe). However, there are reasons to doubt these numbers. First, in their pre-assessment forms, agencies reported a higher percentage of compiled indicators than was finally identified at the meetings. The lower revised counts for both governments were largely because many of the country-level indicators initially reported were not appropriately disaggregated.

Second, as Figures 7 and 8 show, national statistics agencies have until now been responsible for most indicator coverage. Zambia Statistics Agency was responsible for 93% of reported indicators, and Zimstat for 82% of reported indicators. However, this picture changes when we look at the agencies given responsibility for the easily-compiled indicators. In Zambia, 53% of these are expected to originate from the statistics agency, while 47% are the responsibility of other agencies. In Zambia, 82% of indicators are expected to come from data held by agencies other than Zimstat.

[19] Reviews presented at the Forum are available online from the Voluntary National Reviews Database

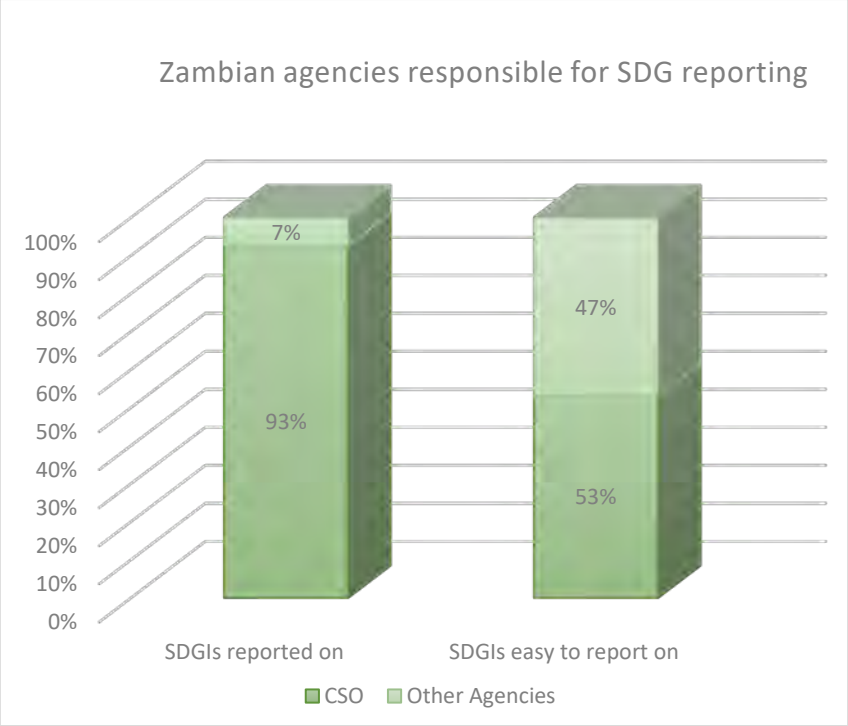

Figure 7. SDGI reporting responsibilities: Zambia

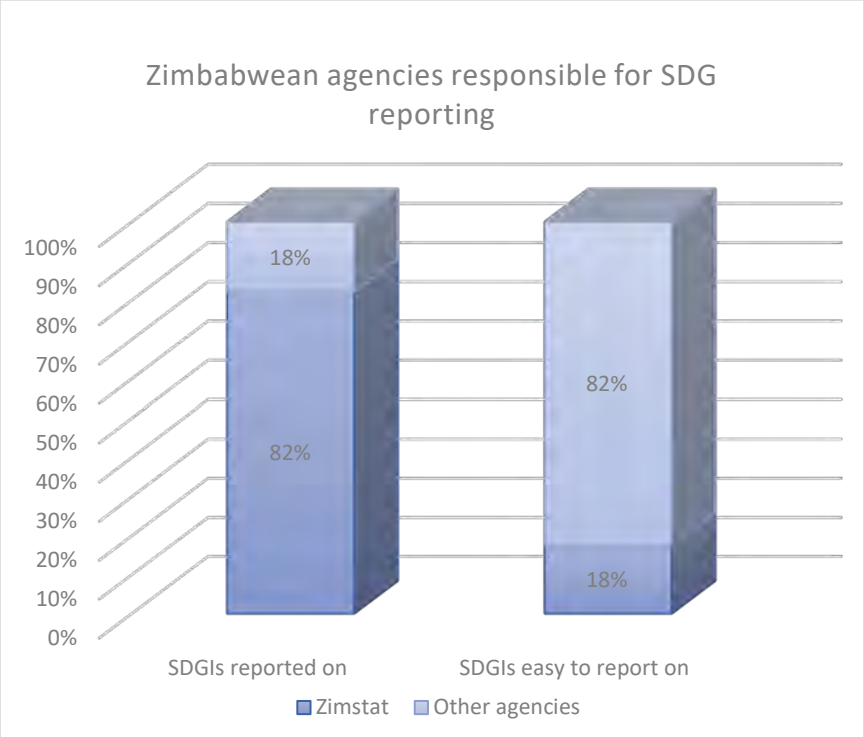

Figure 8. SDGI reporting responsibilities: Zimbabwe

It seems that the wealth of data readily available within these statistics agencies' databases has been mined first. There is obviously untapped potential in both countries in ministries beyond statistics agencies, particularly ministries responsible for education, health and labour. Possibly too, the disproportionate reporting burden of the statistics agencies may speak to weak systems for data discovery and data exchange among agencies. However, it would be fair to say that statistics agencies are better equipped for data reporting than most other agencies. NSAs are the designated data reporting entities within national statistical systems, and therefore have reporting mechanisms in place. Other agencies' data systems may not be well-developed. Thus it could be that reporting on those indicators marked as easy to compile will be a data challenge for these other agencies.

The third reason for a less optimistic view of agencies' near-future data-readiness is the source data identified for the "easy-to-compile" indicators. As noted, in both countries, data sources are reported for both currently-compiled and near-future indicators together. However, agency representatives in both identified administrative records as the main source for indicator values going forward. This posed problems for confirming their reported near-future SDGI data-readiness. The challenge relates to data access. Access to administrative databases and survey datasets was not considered in the design of the UNSD Project. This is surprising, given the absolute necessity of checking reported data sources to obtain an accurate picture of agencies' abilities to provide reliable SDG indicators. As it was, source data was not made available to the team during the in-country meetings.

The team was able to work around this challenge when checking statistical data sources (censuses and surveys). Firstly, some statistical sources for SDGI reporting are available online. For example, country DHS data can be downloaded from the DHS Program. Census and survey reports were also provided to the team in Zimbabwe and the reviewers could to some extent rely on the author's knowledge of Zimbabwean datasets from previous work with the agency. Thus reported indicators from statistical sources could be confirmed, while those from administrative sources had to be accepted by the team at face value. Very little is known about the quality of administrative data held in government databases. Taking these factors into account, it is likely that indicators compiled by 2023 may be fewer than predicted in the UNSD assessment (25% of indicators for Zambia, 28% for Zimbabwe).

7. Policy Implications

The *UNSD-DFID Project on SDG Monitoring* and other UN-sponsored SDG data "capacity-building" projects aim to help governments to identify SDG-planning data gaps (UNStats, 2019). However, as the assessments demonstrate, missing information is not the full picture. There are gaps in SDGI data coverage in these countries, to be sure. But these are almost certainly overstated because these

governments often do not know what data they hold (Jacobs, 2014, p. 5). This is true to differing extents in most countries. For example, a 2001 study of policy data systems in the UK concluded that discovery and re-use were data supply issues, rather than a shortage of data (Solesbury, 2001, p. 5).

One reason for poor data discovery is the model of limited access adopted by these governments, which creates artificial data shortages (Albagli, 2015, pp. 17-18). Limited access models also hamper data exchange among government agencies and between these agencies and policy analysts in academia. The result is that, even where data exists, decision-makers may struggle to find and obtain the reliable evidence they need for planning. They also forgo the benefits of a data-rich research-policy interface that could allow policy feedback from academics. In the case of SDGs, their loss is not only in terms of missed opportunities for economic and social development but includes the loss of citizen engagement based on information exchange which could help governments achieve wellbeing-related SDGs.

It is acknowledged that the data collection to policy process is not linear, and that having the evidence at-hand will not necessarily translate to its use in SDG planning (Porter, 2007, pp. 2-3). However, access to reliable socioeconomic indicators and their source data is a necessary condition for informed SDG policymaking and oversight. There is therefore a need for studies that investigate data-related obstacles to SDG policymaking, particularly in an African context. This study reviews only three African statistical systems. However, the analysis draws on 10 years' experience working with data managers in 15 African countries. Thus data solutions suggested in the study could be effectively adopted by other governments in the region.

8. Recommendations

Recommendations based on the SDGI-readiness assessments are directed at African governments who want to upgrade their national policy data systems to ensure they are ready to respond to the SDG data challenge. The advice is also directed at UN agencies who partner with African governments on projects to build their data capacities for SDG monitoring and reporting.

8.1 Adopt open information governance models that recognise the unique attributes of data

Governments have begun to recognise public-sector data as a resource for achieving national socioeconomic and environmental goals, alongside capital, labour, and raw materials (Capurro, 2003, p. 343). However, unlike labour and the raw materials of production, data is inexhaustible and non-rivalrous. Public sector data should be shared widely, firstly, because it *can* be, given these characteristics. Secondly, openness can enhance interoperability of data systems. The struggle to

produce relevant and timely indicators of SDG progress shows that limited-access models of data governance can be obstacles to delivering information to governments for policy monitoring.

As noted in the UN SDG data framework, national data systems can be optimised if they are built on open data frameworks (HLGPCC, 2017, p. 4). Any attempt to build statistical capacities for data exchange, including indicator reporting, must begin with an information governance model that facilitates ease of access to government-held data. As witnessed during the assessments, limited-access models of information governance will prevent data systems being fully usable and interoperable. African governments that adopt open information governance frameworks can benefit from the technological aspects of such an open approach, which allows for open-source, interoperable technological infrastructures. The philosophical dimensions of openness – greater transparency and collaboration – could reap rewards for governments in terms of citizen trust and co-operation in achieving development goals.

The philosophical explanation for limited-access models arise from the conflation of data ethics with risk management (Thomas, 2008, pp. 46-48). Restricting data access is seen as an ethical requirement to protect personal data. This treatment of *openness as risk* has, however, been challenged in the literature. In fact data protection and open data are both at heart about the ethics of information governance (Albagli, 2015, pp. 18-19). There is an ethical argument for making anonymised versions of citizens' data available for collaborative policy research towards SDG attainment to improve their lives (Dale, 2003, p. 17). The Cape Town global action plan for sustainable development data also asserts the importance of *trust* between governments and users of official data for effective statistical systems (HLGPCC, 2017, p. 3). Greater data openness can build trust in government data and in policy decisions based on this data.

The technical reasons for limited-access data governance models are also based on risk- aversion and the belief that online equals insecure. However, offline sharing is not necessarily more secure, and may in fact make data more vulnerable to security breaches and loss. For example, the 25 million child benefit records lost by the UK Revenue and Customs Department in an infamous 2008 incident were exchanged offline on CD-ROM and yet still went astray (Thomas, 2008, pp. 39-40). In fact, security can be enhanced by openness because open systems must standardise and publish their protocols and methods and thus there is less room for accidental disclosure (Royal Society, 2012, p. 77). Automated systems usually have built-in security checks which make them a better option for secure handling of data provision (Thomas, 2008, p. 41). Finally, widely-shared data must be anonymised, and a commitment to an open approach will necessarily require anonymisation skills within national statistical systems, which can boost these competencies at the country level.

Addressing open government data models is a concrete action for governments and UN agencies working on data capacity-building projects. The aim of UN-sponsored capacity-building projects should be to link project success to easy data access, as "the ultimate benchmark" of data quality (International Monetary Fund, 2008, pp. 16, 22, 32-35)." Better data access can be defined by adherence to already well-defined open data principles (Open Data Charter, 2015). Open government data compliance may be a more meaningful metric for judging data capacity improvements than the number of data platforms installed, or workshops held, which are processes rather than outcomes.

8.2 Build integrated government data infrastructure using a holistic approach

A holistic approach to data governance can counter the notion that data stewardship is solely an IT task. Government information models and UN technical support programmes are sometimes built on this misunderstanding. IT experts are data scientists who are knowledgeable about data architecture. They are *infrastructure* specialists. Data analysts, statisticians and curation experts, on the other hand, are data scientists who are *content* specialists. It is important to clarify this distinction between content and infrastructure and to understand that data management needs both skills-sets. Being cognisant that data scientists come in many flavours will enable governments to develop effective data governance knowledge infrastructure.

Without a big-picture view of data systems, capacity-development programmes may continue to focus on technological solutions without considering other dimensions of the handling of information in organisations (Davenport, 1997, p. 28). Technology upgrades are only a partial palliative without systemic change. A systems approach could help address the non-technical causes of limited data access models, such as risk aversion, low skills levels and limited funds. Organisational change may be necessary to improve the way data is managed and shared (Thomas, 2008, pp. 46-48).

Finally, a holistic view can ensure data capacity development is sustainable. National governments and their UN partner agencies intent on building SDG data capacities would do well to adopt *sustainable data goals* that are not driven only by reporting requirements. As noted in the *Cape Town action plan for sustainable development data*, Such goals must look beyond building data platforms for specific agendas (e.g. MDGs, SDGs) or data points (SDG indicators) and rather focus on building robust official systems to deliver usable (accessible, disaggregated) country-level data to government agencies in the long term (HLGPCC, 2017, p. 8).

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