Dimensions of integration in the statistical system

Michael Bordt, Rikke Munk Hansen, ESCAP

Expert Seminar on Integrated Statistics for the Sustainable Development Goals

11-13 December 2017
Meeting Room E UNCC
Bangkok Thailand

1. Background

The SDGs and the need for integrated statistics

The monitoring requirements of the Sustainable Development Goals demand a broader scope and more detailed and disaggregated statistics. Moreover, several characteristics of the SDGs point to the need for a system of integrated statistics:

- The SDGs include **interlinked** and **inter-dependant** targets (e.g., increasing food supply and energy will negatively impact the environment) (See ICSU report);
- The SDGs imply **conceptual** integration (e.g., GDP/capita assumes same year, national coverage of both economic and population data);
- The SDGs require **spatial** integration across domains (e.g., urban/rural defined similarly for poverty, food, access to infrastructure; unified land cover map integrating forest, agriculture, hydrological data; common geographical codes and names, etc.); and
- The SDGs imply new **interdisciplinary concepts** (e.g., leave no one behind, poverty in all its dimensions, sustainable consumption and production, integrate value of nature in accounts and planning).

In addition, without certainty on future financial and human resources for official statistics, there is an implicit demand to find new and more cost-efficient ways of producing, disseminating and using statistics.

The multi-dimensional and interrelated nature of SDGs, thus, requires support from an integrated statistical system that brings together the production and dissemination toward enhanced efficiency and use of all possible sources of data. An **integrated** statistical system provides the backbone for **integrated** and coherent policy analysis and implementation. Therefore, guidance is needed on processes, methods and concepts for integrating statistical processes, concepts and disciplines in support of implementation of the SDGs.

Global and regional commitments to progress integrated statistics

To address the challenges of SDGs and facilitate production and use of integrated statistics, Governments and development partners have made a series of commitments at the global and regional levels.

At the global level, the "*Cape Town Global Action Plan for Sustainable Development Data*" (CT-GAP), endorsed by the UN Statistical Commission in March 2017, emphasises integration of survey and administrative data, integrated survey and database systems, and expanded use of administrative data for the compilation of integrated social, economic and environment statistics. It recognizes the need to

facilitate the application of modern technologies and new data sources in mainstreaming statistical activities. Furthermore, the Global Action Plan stresses the need to build confidence, trust and capacity through coordinated measures, legal reforms, better funding, development of accompanying principles and guidelines, to support the integration of data from traditional and non-traditional data sources.

At the regional level, "*Advancing official statistics for the 2030 Agenda for Sustainable Development: a collective vision and framework for action by the Asia-Pacific statistical community*" (collective vision) was endorsed by the ESCAP Committee on Statistics in December 2016. The collective vision and framework for action lists ***integrated statistics for integrated analysis*** as one of five action areas, with the objectives of developing an integrated statistical measurement framework for the SDGs and integrating data from multiple sources to generate statistical products that support integrated analysis of sustainable development issues. It suggests that a regional expert group could support the implementation of this action area; functioning as a multi-disciplinary forum for exchanging latest methodological advances and experiences with applying them.

2. The meanings of integration

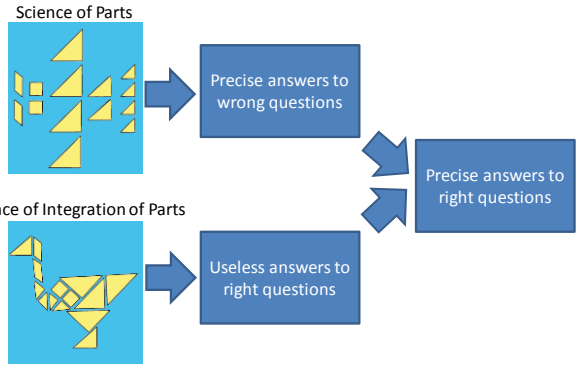
From an official statistics perspective, "integration" can have many meanings. Whenever we bring together two elements that have not been brought together in the past, we are confronted with issues of integration.

The science of parts and the science of the integration of parts

C.S. Holling (Holling, 1998), a Canadian ecologist, provides a useful perspective on this:

*Both the **science of parts** and the **science of the integration of parts** are essential for understanding and action. Those more comfortable in exercising only one of these have the responsibility to understand the other. Otherwise the science of parts can fall into the trap of providing precise answers to the wrong question and the science of the integration of parts into providing useless answers to the right question.* (CS Holling, 1998, Two cultures of ecology)

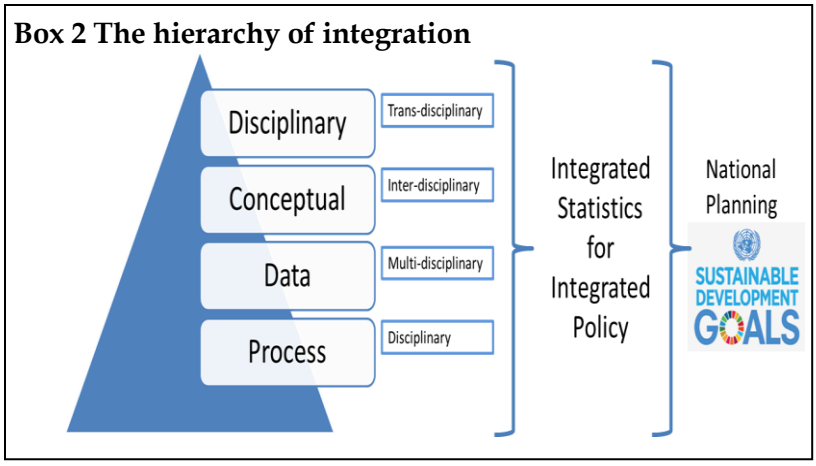
Box 1 The science of parts and integration



In the statistical community, there those who focus on integration and those who focus on the parts. We can also think of the integration of official statistics (the science of parts) with national policy (the science of integration of parts). For effective national planning, it is important to bring the two together (**Box 1**) so we can provide precise answers to the right questions.

Dimensions of integration

Box 2 The hierarchy of integration



Integrating official statistics with other domains, in particular, science and policy is one dimension. For example, producing statistics that are not used, either by policy makers or the public, risks creating "data graveyards". If we do not make decisions based on the best available evidence, including official statistics, we risk making poor decisions. If the best of science is not used to improve the statistical system and policy, we risk promoting "ivory tower" research that has no application. This is not to say that applied research should be favoured over curiosity-driven research, but that the search for new knowledge should have some practical outcomes.

The focus of this paper, however, is integration within the domain of official statistics. This includes statistical processes undertaken not only by National Statistical Offices (NSOs), but all government agencies that collect statistics—which is termed the National Statistical System (NSS). The above discussion demonstrates at least four dimensions of integration within official statistics: process, data, conceptual and disciplinary. These are portrayed as hierarchical in **Box 2**, to suggest the degree of *disciplinarity* (or perhaps, level of difficulty).

Process integration seeks to reduce process *duplication* and *incoherence* through centralization. The approach is to consolidate common processes. Statistical tools for this are GSBPM (Generic Statistical Business Process Model), CSPA (Common Statistical Production Architecture), SDMX (Statistical Data and Metadata Exchange), GISM (Generic Statistical Information Model), DDI (Data Documentation Initiative). This is **disciplinary**, since data themselves are not changed; the same approaches can be applied to economic, social or environmental statistics. Statisticians assess user needs, design and build collection systems, collect and analyse data, disseminate it and evaluate whether the activity achieved its objectives. If not, they return to the assessment or design phase.

Data Integration reduces data *duplication* and increases *usability* and *findability*. The approach is to select data and document it. Statistical tools for this are metadata, inventorying, archiving, modelling, spatial integration (for example by establishing an NSDI, National Spatial Data Infrastructure). Example applications are: FDES (The Framework for the Development of Environment Statistics) compendia, year books, data portals. This is **multi-disciplinary** since data may be converted to selected standards in the process.

Conceptual Integration aligns multi-disciplinary concepts and is therefore **inter-disciplinary**. The approach is to restructure existing data to common concepts, classifications and methods. This is done, for example in:

- the SNA (System of National Accounts), which integrates economic and financial data from multiple sources to calculate GDP;
- SEEA, (The System of Environmental-Economic Accounting), which integrates environmental and economic data by applying common concepts, classification and methods (for example, carbon emissions by industry with the value added of those industries); and
- SAM (Social Accounting Matrix, mentioned in SNA2008), which integrates economic and social data by combining data on economic production with the demographic characteristics of employees and customers.

Disciplinary Integration requires convergence among disciplinary concepts and is therefore **trans-disciplinary**. The approach is to synthesize disciplinary concepts. For example, "ecosystem services" (SEEA-EEA, Experimental Ecosystem Accounting) has different meanings for ecologists, economists and sociologists. Appling the concept statistically, for ecosystem accounting, requires a comprehensive definition that may not fit with any specific contributing discipline. Further examples are:

- macro modelling, which combines data from multiple domains; and
- the SDGs, which also combine data from multiple domains into aggregate goals.

3. Future directions

One assumption that could be tested is that mature statistical systems have adapted their processes, data and concepts to be more amenable to integration. For example, implementing the SEEA would have encouraged alignment of natural resource statistics with economic ones.

Another area of exploration would be to further integrate existing conceptual frameworks—not necessarily with the intent of producing one "framework of everything", but to ensure that measurement systems can be linked with common concepts, classifications and methods. For example, the SEEA sees all "households" as one aggregate. Applying SAM or other social frameworks, it would be possible to disaggregate users of energy, water, timber and ecosystems by income, urban/rural, gender, etc.

4. References

CS Holling, 1998, Two cultures of ecology.

ICSU. 2017. A Guide to SDG Interactions: from Science to Implementation. https://www.icsu.org/publications/a-guide-to-sdg-interactions-from-science-to-implementation