Positioning Statistics as a Development Imperative:
Opportunities in the context of formulating the post-2015 development agenda

Assessing and Monitoring Country Capacity to Produce Statistics: A Framework for Agricultural and Rural Statistics

Mukesh K. Srivastava, Senior Statistician, FAO, Bangkok
Mukesh.Srivastava@fao.org

ABSTRACT

This paper presents the results of global effort made during the last two years to establish a standard framework for assessing country capacity to produce agricultural and rural statistics. The country assessments are the first step in implementing the *Global Strategy to Improve Agricultural and Rural Statistics*. The *Global Strategy Action Plan* envisages the collection of baseline information on an identified set of objectively verifiable indicators to measure the impact, outcome, and output of the *Action Plan(s)* at global and regional level. The initial indicators, based on the data from a self-administered standard questionnaire (SQ) for country assessment, are to be the basis for monitoring improvements in statistical capacity over time in the countries.

The standard questionnaire (SQ) serves as the key source of information on a country's agricultural and rural statistics capacity and more specifically its legislative and institutional infrastructure, available human and financial resources, statistical methods and practices, and the availability of core data.

The initial assessments based on responses to the questionnaire and the resulting indicators of capacity, will allow the regional and global coordinators to orient consultants working on in-depth assessments to probe deeper on particularly weak areas, and to serve as the basis for the development of country-based strategic plans to strengthen statistical capacity through technical assistance and training. Second-stage in-depth assessments by external experts will provide additional information for assessment of the human and financial resources a country needs to seek in order to build a sustainable statistical system, besides methodological improvements ongoing activities.

Keywords: statistical capacity, objectively verifiable indicators, capacity assessment framework.

1. Introduction

This paper presents an introduction to the *Framework for Assessing Country Capacity to Produce Agricultural and Rural Statistics*, a forthcoming two-volume FAO publication. The publication outlines a standard methodology for carrying out the first-stage assessments of a country's capacity to produce agricultural and rural statistics, a key component of the *Action Plan of the Global Strategy to Improve Agricultural and Rural Statistics* (FAO, 2012). The framework provides the necessary structure to record, document and assess the statistical capacity of national agricultural and rural statistics systems and establish objectively verifiable indicators, with respect to their prevailing legislative and institutional pre-requisites, inputs, throughputs, and outputs.

Agricultural development is vital to achieving the Millennium Development Goals (MDGs) related to poverty, food security, and the environment because three out of four poor people in developing countries live in rural areas and depend on agriculture for their livelihood. Commitment to these goals has taken on growing urgency in the global context of the rising food prices and falling food reserves caused by droughts, higher oil prices and the use of food products to produce biofuels. Meanwhile, the quantity and quality of agricultural statistics to monitor progress in achievement of these goals has witnessed a decline (FAO, 2006).

A number of recent studies and evaluations have noted that many of the countries in the developing world lack the basic capacity to produce and report even the minimum set of agricultural data necessary to monitor national trends (FAO, 2008). Furthermore, "the quantity and quality of data coming from national official sources has been on a steady decline since the early 1980s, particularly in Africa, and the quality and availability of official statistics from countries in Africa are at their lowest level since before 1961, with only one in four African countries reporting basic crop production data." (FAO, 2008)

The main criticism of past statistics assistance programs relates to the unsustainability of gains of many of the interventions. Development initiatives have too often been directed to address urgent short-term data needs. Statistics programs that were supported were often those that were established to monitor and evaluate large donor-supported agriculture development programs, but did little to develop a sustainable national statistical system or build the intrinsic capacity of the aid recipient to produce reliable and timely agricultural statistics needed for management of the sector. Sometimes assistance even diverted critical and scarce country resources, weakening the country capacity to meet its core data requirements and the needs of government policy-makers.

Historically, there has also been a lack of coordination and prioritization of technical assistance among development partners. In many instances, technical assistance did not develop skills, know-how, technical expertise and statistical capacity among the national staff in the counterpart countries. The assistance projects also seldom addressed the importance of enhancing the effective demand for data at political levels in order to enlist sustainable funding and other expressions of commitment from national governments and avoid chronic under-resourcing for statistical operations (FAO, 2012).

In comparison, the work done under the umbrella of the Partnership in Statistics for Development in the 21st Century (PARIS21) during the last decade for development and monitoring of the National Strategies for Development of Statistics (NSDS) has met with considerable success, providing a sense of direction to the process of development of official statistics in general.

The Action Plan of the Global Strategy for Agricultural and Rural Statistics, endorsed by the United Nations Statistical Commission (UNSC), February 2010, establishes a comprehensive technical assistance and training program for the target countries, and also a well-targeted research agenda to resolve methodological issues faced by the agricultural statistical systems. The Action Plan follows a new approach for statistical capacity development for agriculture and rural data, and is grounded in the five principles of the "Paris Declaration on Aid Effectiveness" (OECD, 2005) and in the "Accra Agenda for Action" (OECD, 2008).

The country assessments are the starting point for the implementation of the Global Strategy and are to be carried out in two stages. The first stage establishes the baseline information on a countries' statistical capacity, using a self-administered standard questionnaire. The questionnaire, used in the first stage, collects information from the national statistics offices and statistical offices in the ministries of agriculture and other institutions with statistical responsibilities in the agriculture sector.

The foundations of the Statistical Capacity Assessment Framework originate in the Data Quality Assessment Framework (DQAF)[1] developed by the International Monetary Fund (IMF), and the assessment framework proposed in 2002 by the Task Team set up by Partnership in Statistics for Development in the 21st Century (Paris21)[2] on *statistical capacity building* as well as the periodic reviews of statistical systems carried out by FAO statutory bodies on agriculture statistics in Asia and Africa[3].

The country assessments are the means to monitor the growth in country capacities as result of implementation of the Global Strategy and are proposed as the main data source for building objectively verifiable indicators identified in the *Global Strategy's Results-Based Logical Framework*. The country assessments are carried out to gather country level information on the legal and institutional infrastructure, statistical activities, statistical methods and practices, resource deployment, and data availability using a standard questionnaire. The questionnaire based assessments will be used to build a suite of indicators that will reflect countries capacity with regard to agricultural and rural statistics. This information will also provide objective baseline data against which the performance of projects, programs and other statistical capacity-building initiatives could be evaluated. These indicators will also serve the stakeholders in the statistics system in grouping countries according to their statistical capacity, prioritizing interventions, and for supporting efficient investment decisions for building statistical capacity.

2. Statistical Capacity Assessment Framework

Historically, the effectiveness of statistical programs was largely evaluated based on: 1) the statistical inputs, evidence being the use of sound statistical methods and practices, and 2) the statistical outputs, based on an assessment of the regularity in production and dissemination of data.

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[1] The generic DQAF of IMF of July 2003 serves as an umbrella for seven dataset-specific frameworks. The DQAF, July 2003 was introduced at the Fifth Review of the Fund's Data Standards Initiatives. The DQAF is at the centre of the IMF Data Quality Program (DQP). The DQP, comprising applications of the DQAF, is a set of well-integrated initiatives and projects to support and promote good statistical practices identified in the DQAF, and the maintenance and development of dataset-specific DQAF's.

[2] The Paris21 Consortium is a partnership of national, regional, and international statisticians, policymakers, development professionals, and other users of statistics. This Consortium was launched in 1999 and its purpose is to promote, influence, and facilitate capacity-building activities and the better use of statistics. Its founding organizers are the UN, OECD, World Bank, IMF, and EC.

[3] The two Statutory Bodies of the FAO in Asia and Africa are known as Asia and Pacific Commission on Agricultural Statistics (APCAS) and African Commission on Agricultural Statistics (AFCAS). The FAO member nations from respective regions can seek membership of these Commissions as well. These regional commissions meet every two years and their proceedings provide guidance to the statistical development activities of FAO.

These were not really evaluations of statistical capacity, though they provided a reasonable basis for making comparisons among countries and documented the ups and downs of statistics programs over time.

The PARIS21 Task Team initiative was the first systematic attempt at the international level to develop indicators of statistical capacity building that would be applicable across countries. The Task Team project on statistical capacity building indicators was prompted by the pressing demand over the last 10 to 15 years to assess statistical capacity building and development. Among the trends that converged to creation of demand for a better assessment method to assess the capacity to produce reliable statistics, was the greater emphasis put on statistics by the new evidence-based approach to implementing the internationally agreed MDG development goals to reduce poverty.

The Task Team indicators are structured according to six criteria or *"dimensions"*:
1) Institutional Prerequisites
2) Integrity
3) Methodological Soundness
4) Accuracy and Reliability
5) Serviceability
6) Accessibility

The investigations into statistical capacity and capacity building, for developing better strategies to improve statistics, also prompted a realization that much more needs to be known about statistical capacity, related constraints, and the needs of the government offices with responsibility for statistics. This is especially so for technical assistance that needs to be accountable for:

1) Resource capacity: human, financial, and physical infrastructure (offices, information technology, communications, equipment, and transport)
2) Information on the measurable improvements wanted by,
   - Development partners, and
   - Developing country governments that want to know whether the benefits from improvements in data quality and timeliness warrant sustained investments from their own limited resources.

The proposed capacity assessment framework places the focus the on results chain of *INPUT - THROUGHPUT- OUTPUT*, and it recognizes that realization of capacity into performance also needs an enabling environment, which is captured by the *"PREQUISITES",* mostly characterized by the prevailing institutional infrastructure. The framework thus defines statistical capacity as having four dimensions:
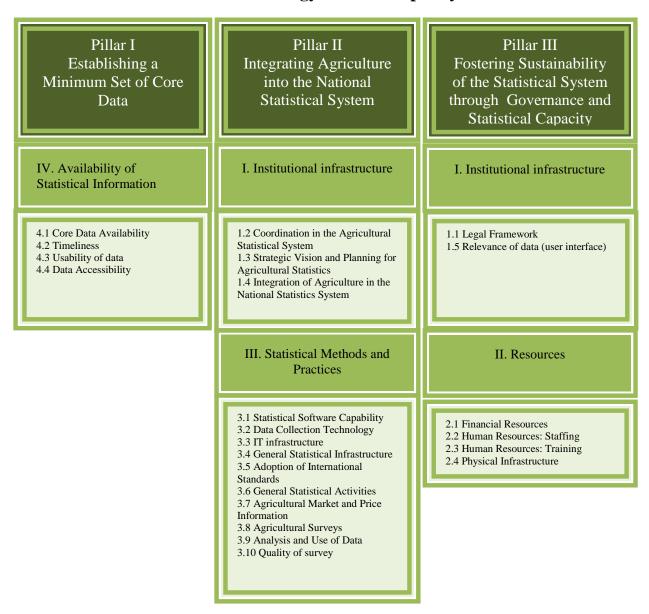
1) Institutional infrastructure Dimension (Prerequisites),
2) Resources Dimension (Input),
3) Statistical Methods and Practices Dimension (Throughput), and
4) Availability of Statistical Information Dimension (Output).

Each of these four dimensions represents a set of characteristic elements of capacity, which within a particular country may be quite independent of each other and may be at different levels of development. For example, a country may have a legal framework that is adequate for the collection of statistics and may be maintaining a user interface that is adequate for the production of relevant statistics, but it may lack the strategic vision for integrating its agricultural statistics survey program with the national survey program or even building an integrated database covering social, economic and environmental dimensions of human activities in the agriculture sector.

This framework can be used for establishing a profile of the country capacity at a point time or for building a single index representing the country capacity. Repeated assessment over a period of time will provide inputs for monitoring the impact of program and projects, which may target building capacity on one or more dimensions or focus on any one element of element of the capacity. Aggregation of the indicator values at the element level will provide indicators on the four dimensions, which can then be aggregated to get overall capacity indicator.

Table 2 in Section 3 presents the structure of the proposed capacity framework. Table 1 below shows how the *Dimensions* and *Elements* of the proposed country capacity assessment framework relate to the *"pillars"* of the *Global Strategy*.

Table 1: Pillars of the Global Strategy and the Capacity Assessment Framework

Pillar I Establishing a Minimum Set of Core Data	Pillar II Integrating Agriculture into the National Statistical System	Pillar III Fostering Sustainability of the Statistical System through Governance and Statistical Capacity
IV. Availability of Statistical Information	I. Institutional infrastructure	I. Institutional infrastructure
4.1 Core Data Availability 4.2 Timeliness 4.3 Usability of data 4.4 Data Accessibility	1.2 Coordination in the Agricultural Statistical System 1.3 Strategic Vision and Planning for Agricultural Statistics 1.4 Integration of Agriculture in the National Statistics System	1.1 Legal Framework 1.5 Relevance of data (user interface)
	III. Statistical Methods and Practices	II. Resources
	3.1 Statistical Software Capability 3.2 Data Collection Technology 3.3 IT infrastructure 3.4 General Statistical Infrastructure 3.5 Adoption of International Standards 3.6 General Statistical Activities 3.7 Agricultural Market and Price Information 3.8 Agricultural Surveys 3.9 Analysis and Use of Data 3.10 Quality of survey	2.1 Financial Resources 2.2 Human Resources: Staffing 2.3 Human Resources: Training 2.4 Physical Infrastructure

3. Indicators for Assessing Statistical Capacity

The new assessment method based on *Standard Questionnaire (SQ)* and Country Capacity Indicators replaces the earlier system of reporting progress in the biennial meetings of the regional statutory bodies of FAO such as, the Asia and the Pacific Commission on Agricultural Statistics (APCAS) and the African Commission on Agricultural Statistics (AFCAS) and preparation of country assessments based on these. *The Action Plan for the Global Strategy* proposes that summaries of the responses to the SQ received from countries be made available to the relevant regional commission or similar international bodies on agricultural statistics.

The scope of the new SQ is also broader than those previously used in Africa and Asia. The *Global Strategy* uses a broader concept of *agricultural statistics*, which covers statistics not only on the crop and livestock sub-sectors, but also the sub-sector of fishery, forestry, and water resources as also other rural income earning activities. Responding to the questionnaire will almost require a collaborative effort of various ministries and agencies of government at the country level, with statistical responsibilities for crop, livestock, fishery, forestry, water resources or rural statistics. However, it is expected that the Ministry of Agriculture and/or the National Statistics Office will play a significant and co-ordinating role in providing consolidated responses.

Country Capacity Indicators are built on a common understanding of the concept of capacity; follow an internationally agreed framework for its assessment; and ensure a meaningful comparison of capacities of countries to produce agricultural and rural statistics, both cross-sectionally and over time. Generally, the proposed indicators are objectively verifiable. However, as some of the elements of the capacity are qualitative, the indicators on these are not as precise as physical measurements, but are at least *sensitive* enough to capture differences across countries and are *valid* in sense that they measure what they are purported to measure, and not something else. *Consistency and reliability* of the indicators relate to how well they reflect changes in reality over time. *Prima facie* the proposed indicators have this quality, but limitations observed in implementation over time can be addresses in future versions of this tool.

An indicator is proposed for each *element* of statistical capacity. The indicators have the same name as the element of the capacity they represent. Table 2 presents the key issues that have been considered in building of capacity indicators. Simple questions, which could be answered in a self-reporting questionnaire, have been prepared around each of these key issues. The responses to the questions on key issues are synthesized according to well-defined scoring criteria. The synthesized score is the value of the indicator for that country obtained on the basis of responses to the relevant self-reporting questions.

The indicators are presented on a scale of zero to one hundred, though a few indicators can take only three or four possible values on this scale. This limitation on sensitivity arises due to the nature of phenomenon being assessed and the number of questions available in the standard questionnaire to build the indicator. Nonetheless, based on experiences on testing the questionnaire in Asia and Africa, the indicators appear sensitive enough to distinguish between various levels of development.

The scoring criteria generally assign equal weight to all questions in the indicator. However, depending upon the number of questions on specific domain used to support a specific indicator, there may exist some implicit weighting. For a few indicators some weighting has been deliberately introduced to get a balanced picture or to transform the responses from various types of questions into a single indicator.

Twenty-eight capacity indicators can be created using the data in the standard questionnaire. Of these, twenty-three indicators, one for each of the elements of statistical capacity, are built on the basis of responses in the standard questionnaire. These element-level indicators can then be aggregated using simple averaging to build indicators on each of the four dimensions. The four dimension-level indicators can be combined for a overall capacity indicator. It is also possible to construct a variety of composite indicators using element-level indicators by assigning user defined weights to the various element-level indicators, depending upon the purpose for which they are compiled.

Table 2. Capacity Dimensions, Elements and Underlying Issues

Capacity indicators (dimensions)	Capacity sub-indicators (elements)	Key issues underlying the indicators
Capacity Indicator I Institutional Infrastructure (PREREQUISITES)	1.1 Legal framework	- Existence, operation and adequacy of a legal framework
	1.2 Coordination in the Agricultural Statistical System	- Existence of an active coordinating body - Span of coordination
	1.3 Strategic Vision and Planning for Agricultural Statistics	- Existence of a strategy and/or a plan for agricultural statistics
	1.4 Integration of Agriculture in the National Statistics System	- Existence of strategy and plan for agricultural statistics and its integration in the NSDS - Span of coverage of sub-sectors of agriculture by the strategy - Use of population census for collecting agricultural information and common cartography for agricultural and population censuses - Coverage of sub-sectors in agricultural census
	1.5 Relevance of data	- Existence and extent of data user interface in agricultural statistics, and channels for receiving user feedback - Span of representation in the data user bodies - Functioning of data user bodies
Capacity Indicator II Resources (INPUT DIMENSION)	2.1 Financial resources	- Existence of separate budget lines for agricultural statistics - Percentage of agricultural statistics activities funded by government budget - General perception of resource constraint
	2.2 Human resources: Staffing	- Occupancy rate of statistical posts - Perception about frequent staff turnover of staff as a constraint
	2.3 Human resources: Training	- Policies and facilities for training of statistical staff - Proportion of staff trained in-country and abroad
	2.4 Physical Infrastructure	- Availability of office space, office equipment and transport for statistical activities
Capacity Indicator III Statistical Methods and Practices (THROUGHPUT DIMENSION)	3.1 Statistical Software Capability	- Types of software used for data processing, data analysis and databases
	3.2 Data Collection Technology	- Use of digital technologies and equipments for the field data collection and transmission
	3.3 IT infrastructure	- Extent of availability of computers to staff - Installation of computer servers for data storage and communication
	3.4 General Statistical Infrastructure	- Existence and availability of digital cartographic material to enumerators - Availability of up-to-date lists, registers and frames for sample surveys -
	3.5 Adoption of International Standards	- Version and extent of adoption of international classifications

	3.6 General Statistical Activities	- Extent of undertaking of key statistical activities like population census, national accounts, price indices etc. and availability of data from these.
	3.7 Agricultural Market and Price Information	- Existence of systems for collecting agricultural prices - Extent of representation of agriculture in market price information systems
	3.8 Agricultural Surveys	- Number of agricultural surveys covering the crop, livestock, fishery, aquaculture, forestry sub-sectors.
	3.9 Analysis and Use of Data	- Compilation of economic accounts for agriculture, food balance sheet, agri-environmental indicators, and terms of trade indices for agriculture
	3.10 Quality of Surveys	- Use of good practices in designing, conducting, disseminating and archiving agricultural surveys
Capacity Indicator IV Availability of Statistical Information (OUTPUT DIMENSION)	4.1 Core Data Availability	- Extent of availability of relevant minimum core set of data
	4.2 Timeliness	- Time lag in available data
	4.3 Usability of available data	- Overall assessment on quality, reliability and consistency of available data
	4.4 Data Accessibility	- Existence of websites and databases for agricultural statistics

4. Using and Interpreting Country Capacity Indicators

One of the expectations from the statistical capacity assessments is that these should allow country groupings that reflect the various levels of statistical development. That is a key part of the effort to identify countries that have limited statistical capacity and likely to be a major beneficiary from a capacity building initiative. The challenge is to obtain agreement on the most useful methodology for classifying and grouping countries.

The Action Plan for Global Strategy proposes a five-group system for classifying and grouping countries according to the extent of their statistical capacity, as measured by the degree to which their agricultural and rural statistics comply with the three pillars of the Global Strategy (1) establish a minimum set of core data, (2) Integrate agriculture into the national statistics system using sound statistical methods and procedures, and (3) establish the foundation for a sustainable agricultural statistics system by means of governance and the necessary resources.

The following five groupings based on the proposals in the Global Strategy could be useful for monitoring the progress of agricultural statistics systems (FAO, 2012).

Table 3. Proposed Global Strategy Country Groupings

Level 5: ADVANCED COUNTRIES
The country • is supplying more than 80 percent of the minimum set of core data on a regular basis; • has conducted an agricultural census or population census with questions on agriculture during the last ten years; • has an existing NSDS (or similar strategic document or plan) with an agriculture component; • has a functioning system for coordination of agricultural statistics in place; and • has elements of a master sampling frame from the completion of an agricultural census or use of area frames.
Level 4: PROGRESSIVE COUNTRIES
The Country

• produces 70–80 percent of the core data items, and
• has at least three of the other four elements noted for Level 5 in place.
Level 3. DEVELOPING COUNTRIES
The Country
• produces 50-70 percent of the core data items, and
• has at least two of the other four elements noted for Level 5.
Level 2: LESS DEVELOPED COUNTRIES.
The Country
• produces less than 50 percent of the core data items, and
• has maximum of two of the other four elements noted for Level 5.
Level 1: LEAST DEVELOPED, FRAGILE AND POST-CONFLICT COUNTRIES
The country does not fall in any of the above four categories. Few, if any, core data items are available, and little or no statistical infrastructure is in place. Resources are very limited or non-existent.

Like any other indicator, the *country capacity indicators* too have limitations. While there are some strong, proven and robust indicators in the suite, it also has some indicators that are new and untested. Coordination of the country's response often appears to be a challenge when two or more ministries take responsibility to answer part of the same question(s) but provide different information. This is particularly true for information on financial resources and budgets for agricultural statistics, which is distributed across line ministries and departments within a country. Experiences with early versions of the questionnaire in Africa and Asia have indicated difficulties in coming up with consistent and reliable indicators for this dimension.

More objective and reliable assessments of the resource dimension should, however, be available from the proposed in-depth assessments, and in the subsequent rounds with additions of more questions in the revised versions of the standard questionnaire. For example, the proposed indicator for financial resource deployment, in the current questionnaire, relies on the responses to a set of proxy questions, which were not part of the pilot testing. It is also expected that more information on budgets and financial resources will be obtained through the in-depth assessments to enhance the reliability and validity of this indicator.

The element level-indicator on the *"usability of available data"*, based on overall quality perception, is also far from being perfect as it entails an element of reporting bias, depending upon the level of knowledge and objectivity of the respondents. Furthermore, the perceptions of *data users community* may be substantially different from those of the *data producer community* that are currently foreseen as responsible people for providing the questionnaire responses.

5. Conclusions and Way Forward

Assessing country capacity to produce agricultural and rural statistics is a critical component of the *Global Strategy Action Plan* for improving agricultural and rural data. The country assessments provide the benchmark data for monitoring change over time with objectively verifiable indicators, and for evaluating the impact of interventions to improve statistical capacity.

Strengthening statistical capacity in developing countries is a long-term initiative, with its implementation proceeding in stages that depend on each country's initial statistical capacity. The statistical capacity of countries will range from those already providing the set of core data from an integrated statistical system to those that essentially have no system in place. In between are the countries that are at various stages of development and whose requirements for technical assistance will range over a wide continuum.

The Global Strategy Action Plan is a long run effort to develop sustainable agricultural statistical systems in developing countries, and it is recognized that significant external support and funding will initially be required to begin the process. It should also be noted that the *Global Action Plan* focuses on capacity development and not on funding actual data collection activities such as censuses and surveys. Therefore, statistical development will continue to be heavily dependent on continued support from developing countries and their development partners.

Although a comprehensive effort has been made through a global consultative process and pilot testing to come up with standard framework and questionnaire for country assessment, at this stage it is expected that there will be future versions of the standard questionnaire which will improve upon experience gathered in implementing the tools developed in this round.

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