

## Toward a Metadata Framework for National Agricultural Statistics

Xiaoning Gong

Food and Agriculture Organization of the United Nations (FAO)

Rome, Italy

Email: [xiaoning.gong@fao.org](mailto:xiaoning.gong@fao.org)

Hiek Som

Food and Agriculture Organization of the United Nations (FAO)

Rome, Italy

Email: [hiek.som@fao.org](mailto:hiek.som@fao.org)

Haluk Kasnakoglu

Food and Agriculture Organization of the United Nations (FAO)

Rome, Italy

Email: [haluk.kasnakoglu@fao.org](mailto:haluk.kasnakoglu@fao.org)

**Abstract:** To establish metadata databases for food and agricultural statistics is considered as one of the key components for improving data quality and statistical development. The concept of metadata in its broad sense describes all aspects of the national system of Agricultural Statistics on how, when, where, why, and by whom the data are collected. Thus, metadata is a primary tool in describing and managing information resources, and useful and beneficial to both users and producers of statistics. The challenge faced by the management of metadata at the international level is how to design a framework so that it can be used by countries to collect the relevant and succinct information in a manageable and comparable way on the current stage of the national Agricultural Statistics for assessing data quality, identifying areas of further development, assisting to plan, design, implement, and coordinate national and regional statistical capacity building programs and activities.

Based on its long history of experience in assisting countries to document their agricultural statistical systems and methods, in 2006 FAO Statistics Division distributed an “Annotated Outline for Preparing Country Report on Metadata for National Agricultural Statistics” to two groups of countries with 16 each in two continents, Asia and the Pacific and the Middle East. The Outline provides a framework for countries to prepare metadata focusing on three main areas: (i) the national system of agricultural statistics; (ii) major domains and selected indicators of agricultural statistics; and (iii) major data sources for agricultural statistics. The idea is to view the national system of agricultural statistics as a production function and to ask what inputs, data sources, are used to produce what outputs, domains and indicators. The framework has since been improved with the benefit of feedbacks from consultation and discussion with countries, and the application of the framework in selected pilot countries for preparing country reports on metadata for national agricultural statistics.

*JEL Code:* C1, L23, Q10

*Keywords:* country report, data quality, data source, domain, food and agricultural statistics, framework, indicator, metadata, outline, users and producers of data.

## 1. Introduction

Metadata has many different definitions. The most common definition of metadata is the literal translation, “metadata is data on data.” For our purpose, we adopt the concept of metadata in a broad sense that metadata describe all aspects of the national agricultural statistical systems on how, when, where, why, and by whom the data are collected. This is indeed very broad as it includes data, activities, people, and organizations involved; locations of data and processes; access methods; specific functions, responsibilities, and relationship of national statistical organizations; definitions and concepts of indicators, classifications, and description of major quality aspects of the data; limitations, timing and events, motivation and rules, the structure and workings of an organization’s use and management of information.

Such information is useful and beneficial to both the users of statistics who access and utilize the data and statisticians who collect, process, compile, and disseminate the data. It will help users to better understand thus use the related statistical data. For statisticians, the process of preparing metadata itself is a way to identify the strengths and weaknesses of related statistical systems, through which more effective cooperation programs can be designed and implemented, and national statistical offices will have an important advocacy tool at disposal. All this will contribute to more effectively manage resources to provide and disseminate to the public of relevant, consistent, timely, accessible, and reliable statistics. Thus, metadata is a primary tool in describing and managing information resources. To establish metadata databases for food and agricultural statistics is considered as one of the key components for improving data quality and statistical development.

To advocate and facilitate the flow of metadata between national and international statistical offices, in 2006 FAO Statistics Division undertook the initiative to design and distribute an “Annotated Outline for Preparing Country Report on Metadata for National Agricultural statistics” to two groups with 16 countries each in two continents of Asia and the Pacific and the Middle East. The Outline provides a uniform framework for countries to prepare country reports focusing on three main areas in an organized and systematic way: (i) national system of agricultural statistics; (ii) major domains and selected indicators of agricultural statistics; and (iii) major data sources for agricultural statistics.

In response to the question addressed in this Conference: “What should adequate metadata be?” it is important to identify what kind of users of the metadata they are. For different users, the degree of adequacy is different. The FAO metadata framework for national agricultural statistics is designed to meet the needs of providing (a) materials for compiling succinct country summary profiles as the first presentation of useful and comparable information on countries about the current stage of development of the agricultural statistical system; (b) a reference for assessing data quality, identifying areas of further development, and assisting to plan, design, implement, and coordinate national and regional statistical capacity building programs and activities; and providing advocacy tools to national statistics offices; and (a) an input for updating FAOSTAT comprehensive metadata and data quality framework.

Through reporting on the FAO initiative on establishing a metadata framework for national agricultural statistics, this paper is aimed to stimulate further discussion of the elements that represent the priority areas of metadata and the organization of these elements into a framework to help in establishing metadata across a range of countries and data situations. Country reports and related experience of these participating countries shed some light on whether the FAO metadata framework has achieved its original goal of assisting country

reports on metadata to cover relevant, sufficient, and comprehensive information in a systematic and comparable yet not encyclopedic way.

Accordingly, this paper has five sections following this “Introduction” section. The next, Section 2, is “History of Experience in Metadata at FAO” to review the background and institutional experience of FAO in documenting metadata for national agricultural statistics. Section 3 is “Structure of FAO Metadata Framework” to describe the structure and rationale of the FAO metadata framework. It is followed by Section 4 of “Consultation and Feedbacks from Member Countries” to highlight comments and suggestions received from member countries that have participated in the preparation of country reports on metadata. Next, Section 5 is “A Preliminary Review of Country Reports” to give a first look of the results of the country reports in a view to examine the structure of the FAO metadata framework. Finally, the last section, Section 6, is to summarize and conclude the paper.

## **2. History of Experience in Metadata at FAO**

The FAO metadata framework for national agricultural statistics has been built on its long history of accumulated experiences in the establishment of metadata of agricultural statistics. As a provider of the largest agricultural database in the world, FAO has always put a high priority on the documentation and metadata of national activities in organizing, collecting, processing, and disseminating food and agricultural statistics.

### **2.1. Publications of Data Collecting Methods**

As far as back to 1955, a publication entitled *Methods of Collecting Current Agricultural Statistics* was published by FAO. In 1974-5, another publication (in two volumes) entitled *National Methods of Collecting Agricultural Statistics* was issued by FAO. Each country has two to three pages to highlight the topics of administrative division, organization of statistical activities, system of data collection, including current agricultural statistical activities, agricultural censuses, and special enquiries and ad hoc surveys, as well as derived statistics.

From March 1979 to May 1980 total 19 issues of Supplements to add and update to the above publications were compiled, and on average five to six countries in each issue. The contents of the national reports are presented in the same format as adopted in the earlier publications.

In 2000, as part of the Regional Project for the Improvement of Agricultural Statistics in Asia and Pacific Countries, publications entitled *General Status of the Food and Agricultural Statistics* were prepared for Bhutan, Cambodia, Iran, Laos, Nepal, and Vietnam. Some of the common subjects found in these country reports are overview, organization, statistical law, classification systems, national & agricultural accounting systems, data collection, technology, statistical plan, and technical cooperation.

### **2.2. Metadata Survey Questionnaire**

More recently, to make country statements on the "Present state of Food and Agricultural Statistics in the Countries of the Region: Country Statements" more relevant and focused during the FAO Regional Commissions on Agricultural Statistics, a standardized Statistical Metadata Survey Questionnaire is distributed to member countries for collecting related information. The first questionnaire was sent to countries in Africa in 2003. Out of 53

countries, 43 replied and a preliminary summary presented during the 18th AFCAS was highly appreciated by the delegates.

The Questionnaire was then used for the 20th APCAS in 2004 in India. Summary of the Questionnaire results was compiled as APCAS/04/05, "Country Questionnaire on Current Status of Agricultural Statistics System," based on the completion of Questionnaires by 17 countries. The Commission agreed that the use of FAO Questionnaires was effective in providing information on the different activities undertaken by the member countries, but that the Questionnaire should be revised with examples in order to improve the consistency and completeness of the responses.

A revised Questionnaire, in which questions used for FAOSTAT ABCDQ and AFCAS/APCAS were combined, streamlined, and improved into a manageable size, was again adopted for the 21st APCAS in 2006 in Phuket, Thailand. It was reported to the Commission that 21 countries responded to the survey. The value of complete and accurate information generated from the questionnaires in establishing metadata of agricultural statistics in countries was again recognized.

Experience shows that the Questionnaire is ideally to be completed by a small working group composed of the head of the national statistics office and the head of the agricultural statistics office and in collaboration with all major institutions involved in food and agricultural statistics in the country. Issues raised include clarification of concepts, complexity of questions, time consuming to fill out the questionnaire, and more guidance is needed.

### **2.3. FAO ABCDQ Website**

At the same time, a metadata repository, the Agricultural Bulletin Board on Data Collection, Dissemination and Quality of Statistics (ABCDQ) was established within FAOSTAT in 2000 to provide information on the sources and methods of data collection and dissemination. Country pages in FAO ABCDQ are based on the information collected in the FAO Questionnaire on "National Methods of Collecting Current Crop and Livestock Statistics and on Their Dissemination," which comprises three sections:

- Data completeness is assessed according to the availability of official data for the last four years. The indicator presented as barometer is calculated for crops and livestock production as well as agricultural trade statistics of export and import.
- Data collection includes organizations, contacts, source of information, specification and coverage of data, and data collection method and techniques.
- Data dissemination includes organizations, contacts, dissemination format, periodicity, classification systems, timeliness and lapse time of data published, official comments, advanced notice of methodological changes, cross checks, and release calendar.

The efforts FAO makes in documenting and building metadata for national agricultural statistics have lasted for more than a half century. Two features of the early year experience with publications of data collecting methods are: first, while the number of countries included is large, the coverage for each country is relatively limited with normally two to three pages per country; second, while very useful materials of countries are provided in the publications, they are not really metadata in a strict sense due to a lack of consistency and comparability

between different countries. The recent experience with the metadata questionnaire calls for more guidelines in order to improve the accuracy and completeness of responses from countries. The latest FAO metadata framework is thus a continuation, synthesis, and expansion of the long history of institutional experience and endeavor in metadata.

### **3. Structure of FAO Metadata Framework**

The first version of the structure presented in Table 1 in the Appendix was designed along with the “Annotated Outline for Preparing Country Report on Metadata for National Agricultural Statistics” in 2006 and distributed to two groups each with 16 pilot countries for preparing country reports on metadata. The current version is a revision after taking into account feedbacks from the Sub-regional Workshop in the Philippines for a group of countries in Asia and the Pacific. The purpose is to provide guidance as concrete and detailed as possible for countries to use in compiling their Country Reports.

In general, the Country Report on Metadata is expected to comprise three main chapters on (a) the national system of agricultural statistics; (b) major domains and selected indicators of agricultural statistics; and (c) major data sources for agricultural statistics. The idea is to look at the national system of Agricultural Statistics as whole like the production base and environment as in the model of a production function and to ask what inputs have been used to produce what kinds of outputs. The inputs here refer to the major data sources for agricultural statistics such as censuses, surveys, and administrative records; while the outputs refer to the products of agricultural statistics such as various domains and selected indicators.

For example, Chapter 1 of the Country Report, “National System of Agricultural Statistics” is to describe the system of agricultural statistics within the national statistical system in a country, covering major national statistical agencies involved in the agricultural data collection, compilation, and dissemination; legal framework/background; structure, organization, and resources; dissemination policy of agricultural statistics; and cooperation with other government agencies, academia, and international and regional organizations. The description of the system of agricultural statistics in the country provides a context for the presentations of the operation of agricultural data collection and the production of major national statistical outputs in the next two chapters.

The focus of Chapter 2, “Major Domains and Selected Indicators of Agricultural Statistics,” is to provide detailed information on the major statistical domains and related indicators/time series of agricultural statistics such as production, trade, consumption, prices, fertilizer, land use, labor and employment. Expected detailed information includes concepts, definitions, classifications, coverage, availability, data sources, responsible agencies, data processing, estimation and revision methodology related to the major domains and selected indicators. If relevant, after completing the major domains, one may also explore to other domains, for instance, of aquaculture, forestry, irrigation, and land degradation among others. The chapter is divided into two sections: the first section is to list outputs, all domains with selected indicators, and the second section is to discuss the metadata for each of the selected outputs.

Chapter 3, “Major Data Sources for Agricultural Statistics,” is to explain the operation of data collection for agricultural statistics within a country. Three major data sources and related data collecting methodologies to be documented are agricultural censuses, surveys, and administrative records or registers, with an emphasis on those more regularly and frequently conducted censuses and surveys with detailed descriptions. For censuses and surveys, the

minimum required information includes overview, census/survey design, conduct, operations, data quality control, and related statistical reports. For administrative records and registers, the minimum required information includes responsible agency that provides the records/registers, description of the contained information such as items and area covered and method of preparation, and data sources, that is, units that provide information for the administrative records and registers. Similar to Chapter 2, the chapter is divided into two sections: the first section is to list inputs, all censuses, surveys, and administrative records and registers, and the second section is to discuss the metadata for each of the inputs. By following a unified format and method for documentation, it is hoped that the results will be much easier and better exchanged and understood.

Such a metadata framework has a close link to many other metadata and quality assessment initiatives by other organizations. For example, its link with the IMF Data Quality Assessment Framework can be demonstrated in Table 2 in the Appendix. While the IMF Data Quality Assessment Framework is mainly for macroeconomic statistics, the FAO metadata framework is focusing on national agricultural statistics. Besides, the FAO metadata framework is to document the current situation of the national agricultural statistics without making much assessment. Nevertheless, documentation is a pre-requisite of the quality assessment. As shown in Table 2, to make metadata accessible is in fact part of Quality Dimension 5 “Accessibility” of the IMF Data Quality Framework. In addition, Table 2 also demonstrates that across several quality dimensions, the same elements are found in both frameworks. Materials in various chapters of the FAO metadata framework, including concepts, definitions, and classifications; methodology of estimates; data availability and accessibility; and methods of data collection among others, provide the basic information for conducting quality assessment as in the IMF Data Quality Framework.

## **4. Consultation and Feedbacks from Member Countries**

### **4.1. Consultation**

The FAO metadata framework has been circulated in various occasions including regional commissions of agricultural statistics and sub-regional workshops. It has also been applied to some pilot countries for preparing country reports on metadata for national agricultural statistics. The feedbacks from discussions and practice in the field have provided very valuable inputs for a further improvement of the framework.

The framework was introduced to the APCAS in 2006 in Thailand. The Commission recognized that there was a strong need for metadata. Statistical metadata would provide a better understanding of all the data items and the way to obtain them within the national system of agricultural statistics. Some countries, including Australia and the Philippines reported that it was worth spending adequate efforts to document the metadata. While there might be some reluctance at the beginning, staff involved appreciated the value of metadata once the documentation was completed as they understood better the methodology used and the quality of data produced. These often led to the introduction of improvements for future activities. It commended FAO for taking the initiative of documenting the metadata for national agricultural statistics. It urged member countries that would take part in the forthcoming Workshop on the subject in October 2006 to seriously prepare their reports following the outline provided for this purpose and to fill in the supporting questionnaire as accurately as possible.

A Sub-regional Workshop was held from 23 to 27 October 2006 in Manila, Philippines. Before the Workshop, the invited countries were requested to fill in the Questionnaire and to prepare their Country Reports based on the information collected in the Questionnaire. The Review Committee of the Workshop would review the Reports and provide written comments. This back-and-forth process from receiving the first draft to the final Reports took two to three runs during the two-month period of 1 August – 30 September 2006. Country Reports on metadata for national agricultural statistics were thoroughly discussed in the Workshop. The 16 participating countries in Asia and the Pacific region were Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Iran, Lao PDR, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Viet Nam.

## **4.2. Feedbacks**

Issues discussed and agreements reached at the Sub-regional Workshop are briefed as follows.

### **4.2.1. Gaps in the Draft Country Reports**

Using the FAO annotated Outline as a basis to review the draft country reports received, one of the common features found was the missing of information in various sections of the Country Reports. For example, many drafts had no clear reference to existence of advisory bodies, no discussion on administrative relationships among agencies, as well as no information on budgets and statistical programs. Information on calendar release of statistics, pricing policies, ministerial commentaries, and advance notices of change methodological changes were often not provided. Reports did not mention whether or not data producers conduct dialogues with users. There was no discussion of whether or not modes of international cooperation exist. A number of reports also did not discuss strategic plans in the statistical agencies. There was no information regarding the availability of time series data. Many reports did not provide information on the process involved in handling missing data, revisions, updating, and seasonal adjustment. The sub-topic on other reference information was not given much attention. Only a few reports presented the overview of censuses, surveys and administrative registers. Descriptions on designs of surveys and censuses needed more organization (Secretariat of the Workshop 2006).

### **4.2.2. Problems and Difficulties Encountered**

- Information on financial and human resources: budgets and personnel devoted to agricultural statistics are not easy to determine for many national statistical systems.
- Statistical calendar: there is no such calendar in some countries since the conduct of the census and other statistical activities are not regular.
- Metadata for statistical domains: Chapter 2 for the domains and selected indicators is more difficult than others of the metadata framework.
- Language: while there is metadata available in national language, it takes time and effort to translate them into English.
- Coordination of the compiling metadata: especially for a decentralized system of agricultural data collection and data collected and compiled by different agencies, each agency may use its own methodologies and formats.

Experience in the preparation of the report on metadata in the Philippines is quite revealing: a team across the Bureau of Agricultural Statistics (BAS) operating units worked on the preparation of the report and in the course of writing, a series of meetings and clearing sessions were conducted. While the team followed the suggested FAO metadata outline, it also raised concerns about the seeming duplications and gaps at the onset of the report writing. Nevertheless, these concerns were cleared and the draft report was put in place. BAS staff worked on the country report on the metadata from May to October in 2006. The good practice is that it is important to form a focal group drawing focal point persons from different agencies in the country to support metadata so that representatives from various ministries, departments, and organizations are obliged to give the information required.

### **4.2.3. How to Handle Different Materials**

In Chapter 1, whenever applicable, copies of the law, decree, legislative acts, or executive orders that pertain to statistics generation and serve as basis for legal mandates for the agricultural statistical systems should be appended in the annexes. Since the report will undoubtedly involve many acronyms, some of them specific for a country, it would be best to include a list of acronyms at the beginning of the report. The term “reference period” for statistical publications is vague and is suggested to be omitted. For statistical publications, it is necessary to indicate in which language and published in what “formats”: book, journal, bulletin, brochure, newsletter, periodical, diskette, compact disk, web-based, or broadcast.

In Chapter 2, definitions, concepts, and classifications used are for domains but not for indicators. It should be spelled out whether they follow international standards or not. Data processing, estimation, and revision methodology are for key indicators but to be described by domains. The list of domains in the Outline is indicative, and most of them are supposed to be the essential ones. Countries should feel free to include additional domains if considered to be necessary such as welfare indicators including poverty indicators, living standard, social economic survey, and gender statistics. The list of major domains of agricultural statistics should be complete, along with major indicators as examples.

In Chapter 3, when several surveys have the same methodology or where data come from cross-sectional surveys repeated across several periods, the description need not be repeated rather it could be by type of surveys. Among several surveys with a similar methodology, one of these surveys could be described in detail, in terms of its overview, design, and conduct. If a particular country conducted the same survey, it was good to mention the starting date in the metadata. In fact, metadata in Chapter 3 of the Outline for major censuses and surveys should make full use of the existing documents in each country for censuses, surveys, and administrative records. “Other Reference Information” called for a list of other information that could be linked to data as reference material, e.g. questionnaire, manual of operations, similar studies, etc.

To build a linkage among Chapter 1, Chapter 2, and Chapter 3: for Chapter 1 and Chapter 2, it is suggested to insert a column in the table of publications to indicate the domains that have been covered by each of the publications (or reports) of agricultural statistics; for Chapter 2 and Chapter 3, to insert a column in the table of domains to indicate the data sources that have been used by each of the major domains of agricultural statistics, where data sources refer to censuses, surveys, or administrative records / registers.

In general, the country reports should not include data or indicators for the domains described in the metadata. Actual data and corresponding analyses are not part of metadata; they only make the report unnecessarily long. When confronted with a choice to present information in text or matrix format, it is better to keep texts in the main body and append corresponding matrixes or tables in the annexes.

## 5. A Preliminary Review of Country Reports

Countries are asked to present what statistical outputs they produce and what inputs they use. In terms of outputs, there are mainly two measures. The first is the major statistical publications, and the second is the major domains and selected indicators of agricultural statistics in their countries. The inputs here refer to statistical surveys, and censuses, and administrative records and registers.

### 5.1. Major Publications, Domains, and Data Sources

The most common one is the *Yearbook of Agricultural Statistics*. Almost every country would produce such a report every year. Much fewer countries would publish quarterly and monthly indicators of agricultural statistics. The second most common report is the *Report on Agricultural Census / Survey* after a census or survey is completed. While most agricultural statistics are reported on an annual basis, one of the few monthly reports is *Agricultural Price Statistics*. Another common feature is that, in publications such as *National Statistical Yearbook* and *National Annual Statistical Key Indicators*, usually there are chapters designated for agricultural statistics. Other publications observed in several countries are separate publications of *Agricultural Foreign Trade Statistics*, *Food Security and Early Warning Statistics and Analysis*, *Food Balance Sheet*, and *Costs of Agricultural Production Statistics*. Four countries also include *Fishery Production Statistics* and three countries include *Forestry Production Statistics*. Among the 16 countries, India, Nepal, Philippines, Thailand, and Vietnam have listed the most publications, with about eight to nine kinds of publications, while Fiji, Iran, Laos, and Pakistan have the least numbers of publications, mentioning two to three kinds of publications.

The most important domains listed by a descending order are as follows: “production,” “price,” “trade,” “agricultural inputs (including: agricultural machinery, fertilizer, and pesticides),” “land use,” “food consumption,” “labor and employment,” “rural communities and infrastructures,” and “agricultural credit.” Bangladesh, Cambodia, China, India, Iran, Myanmar, Nepal, Philippines, and Thailand have listed the most domains, ranging from eight to ten numbers of domains, while Fiji has listed the least number of domains, only one domain.

The most common ways of collecting data are first the “agricultural census.” Almost all the pilot 16 countries except Cambodia have conducted at least once agricultural census. The second is “crop production survey,” and “livestock production survey.” Most countries in this group would conduct the two surveys separately from the “crop production survey.” The only two countries that have not conducted a crop production survey are: India and Pakistan. Down the list are: “cost of production survey,” “land use survey,” “crop cutting survey,” and “labor force survey.” Some countries list “population census,” “fisheries census,” “forestry census,” and “household living standard / conditions survey / socio-economic survey,” reflecting the important roles of these statistical censuses and surveys in the respective national systems of agricultural statistics in these countries. Since these censuses and surveys are also very likely conducted in most of the countries in this group, not list them as part of agricultural statistical

activities, the low number of these censuses and surveys may reflect this fact rather than indicating low occurrences of these censuses and surveys. On the contrary, it may be worth to note that the following surveys have very low rate of occurrence: “agricultural machinery survey” and “agricultural stocks survey.” China, India, Myanmar, and Philippines have listed the most numbers of censuses and surveys, while Bhutan, Fiji, Iran, and Pakistan have listed the least numbers of censuses and surveys.

## **5.2. Relationship between Major Domains and Data Sources**

In general, among this group of countries, various specific surveys and censuses produce data for the domains of production, prices, and labor and employment. Data for the domain of foreign trade are usually provided by the customs or line ministries. Administrative records and registers and agricultural census are the main inputs for the domain of land use. The domains of fertilizers and pesticides obtain data from companies or line ministries. The common data source of food consumption is household income and expenditure survey.

From the “Summary Table of Country Reports on Metadata for National Agricultural Statistics” ([Table 3](#) in the Appendix), the relationship between major domains and data sources seem to be quite consistent in the country reports of China, India, Myanmar, and Philippines, where a large number of domains is met by a large number of data sources; and in the country reports of Fiji and Laos, in which the limited numbers of publications, domains, and data sources are matched to each other. In between, there are a low number of publications, a moderate number of domains, and a low number of data sources in Pakistan; as well as the highest number of publications, domains, and a slightly large number of data sources in Thailand and Vietnam.

A seemingly inconsistent relationship is found in the cases of Bangladesh, Cambodia, Iran, and Nepal. At first glance, they seem to have a large number of domains but a moderate or low number of data sources. The question is: where do they get data to fill in the domains? A review of the country reports of these four countries provides most of the answers, which reveals the merit of the detailed descriptions of the country reports.

As shown by the symbol of  $\oplus$  in Section III “Major Data Sources for Agricultural Statistics” of [Table 3](#) “Summary of Country Reports” in the Appendix, some of the censuses and surveys that have not been described in [Chapter 3](#) of these country reports are used as data sources for the domains in [Chapter 2](#). These include “population census,” “household income and expenditure survey,” “crop cutting survey,” “farm prices survey,” and “agricultural marketing information survey.” Once these surveys have been added, the relationship between the inputs and outputs for Bangladesh, Cambodia, and Nepal is actually quite consistent as in other countries. The only “exception” is for Iran: while there is no additional survey found in its country report other than [Chapter 3](#), for many agricultural statistical indicators, the data sources are labeled as “expert estimation” in [Chapter 2](#) of its country report.

## **6. Summary and Conclusion**

The FAO metadata framework for national agricultural statistics provides an answer to the question of the Conference: “What should adequate metadata be?” Focusing on the key aspects and final products of the national agriculture statistical system, namely listing the major censuses and surveys it has conducted and the major administrative registers it has relied on to acquire needed statistical data in order to produce major agricultural statistical

domains and indicators, a country report following the framework would provide most essential and useful information for both users and producers of national agricultural statistics.

Construction of metadata is more than just an exercise of documentation; some initial country experience has shown that, using properly, it can actually serve as a means to improve the agriculture and food statistical system in a country. During the preparation, to review, understand, and analyze all the details and aspects of the metadata is, at the same time, to review, understand, and analyze the national system of agricultural statistics. By the same token, to exchange the metadata among countries is also a process to share and exchange the good experiences in terms of national system of agricultural statistics, major agricultural domains and indicators, as well as data collection and survey and census methodology.

To successfully implement this initiative of establishing metadata for national agricultural statistics, it requires joint efforts by all concerned parties. Lessons learned from the practice are that in order to produce a good quality metadata, it is not sufficient to have a framework, it is also important to have a process and mechanism to provide feedbacks to countries and check if the country report has covered the needed information. As found in the above, even after three rounds of back and forth review and revision, there are still a lot of missing information found in the country reports.

The task of establishing a complete metadata framework for national agricultural statistics is still a continuing process at FAO: As a follow-up, compendiums on Metadata for national agricultural statistics will be compiled; website for the results of questionnaire has been set up; the FAO ABCDQ is currently under development to better stimulate country input and gather national metadata in an organized and systematic way. The Questionnaires and Country Reports produced from the current FAO's initiative on metadata will provide useful information for the update of FAO ABCDQ.

## REFERENCES

- Carson, Carol S. (2000). "What Is Data Quality? A Distillation of Experience," IMF Working Paper, Washington, DC.
- EUROSTAT (2002). *Enlarging the EU Statistical Network*, European Commission, Luxembourg.
- FAO (2007) "Metadata for National Agricultural Statistics" (16 Country Reports by Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Iran, Lao PDR, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Viet Nam individually and respectively) (Manuscript).
- FAO (2004). "Questionnaires" for APCAS New Delhi, 2004  
<[http://www.fao.org/es/ESS/meetings/download/afcas2005/survey\\_EN.htm](http://www.fao.org/es/ESS/meetings/download/afcas2005/survey_EN.htm)>.
- FAO (2002). The "Agricultural Bulletin Board on Data Collection, Dissemination and Quality of Statistics project (ABCDQ)" <<http://faostat.fao.org/abcdq/about.htm>>.
- FAO (2001). "General Status of the Food and Agricultural Statistics" prepared by Bhutan, Cambodia, Iran, Lao PDR, Nepal, and Viet Nam <<http://www.faorap-apcas.org/>>
- FAO (1979-84). "National Methods of Collecting Agricultural Statistics" (Supplement No. 1-19). (Manuscript).
- FAO (1974). "National Methods of Collecting Agricultural Statistics" (Volumes I & II). (Manuscript).
- IMF. "SDDS, GDDS, and DQRS" in the IMF Dissemination Standards Bulletin Board website <<http://dsbb.imf.org/Applications/web/dsbbhome/>>. (Website).
- Secretariat of the FAO Sub-regional Workshop (2006). "Report on the Sub-regional Workshop in the Philippines in October 2006." (Manuscript).
- Statistics Canada. "Definitions, data sources and methods: survey numbers, including related surveys" <<http://www.statcan.ca/Daily/English/051221/d051221e.htm>>. (Website).
- UNSD. Country Profiles of Statistical Systems  
<<http://unstats.un.org/unsd/nsoprofiles/default.aspx>>. (Website).

## APPENDIX

Table 1: Structure of FAO Metadata Framework for National Agricultural Statistics

<p><b>Title: METADATA FOR NATIONAL AGRICULTURAL STATISTICS IN (<i>Country Name</i>)</b></p> <p><b>CHAPTER 1: National System of Agricultural Statistics</b></p> <p>1.1 Legal framework and statistical advisory bodies</p> <p>1.2 Structure and organization of major agricultural statistical agencies</p> <p>1.3 Outputs and dissemination of agricultural statistics</p> <p>1.4 Dialogue with data users and co-operation with international organizations</p> <p>1.5 Strategic framework</p> <p><b>CHAPTER 2: Major Domains and Selected Indicators of Agricultural Statistics</b></p> <p>2.1 List of major domains and selected indicators</p> <p>2.2 Metadata for each of the major domains</p> <p>2.2.1 Major <u>domain 1</u> (e.g., production)</p> <p>2.2.1.1 Concepts, definitions and classifications</p> <p>2.2.1.2 Coverage, availability, data sources and responsible agencies</p> <p>2.2.1.3 Data processing, estimation and revision methodology</p> <p>2.2.1.4 Other reference information</p> <p>2.2.2 Major <u>domain 2</u></p> <p>[<i>Same sequence of information as above</i>]</p> <p><b>CHAPTER 3: Major Data Sources for Agricultural Statistics</b></p> <p>3.1 List of major agricultural censuses, surveys and registers</p> <p>3.2. Metadata for each of the major censuses</p> <p>3.2.1 Major <u>census 1</u> (e.g., census of agriculture)</p> <p>3.2.1.1 Overview</p> <p>3.2.1.2 Census design</p> <p>3.2.1.3 Conduct, operations, and data quality control</p> <p>3.2.1.4 Statistical report</p> <p>3.2.2 Major <u>census 2</u></p> <p>[<i>Same sequence of information as above</i>]</p> <p>3.3 Metadata for each of the major surveys</p> <p>3.3.1 Major <u>survey 1</u> (e.g., Rice and corn production survey)</p> <p>3.3.1.1 Overview</p> <p>3.3.1.2 Survey design</p> <p>3.3.1.3 Conduct, operations, and data quality control</p> <p>3.3.1.4 Statistical report</p> <p>3.3.2 Major <u>survey 2</u></p> <p>[<i>Same sequence of information as above</i>]</p> <p>3.4 Metadata for each of the major administrative registers</p> <p>3.4.1 Major <u>administrative register 1</u> (e.g., Foreign Trade Statistics)</p> <p>3.4.1.1 Responsible agency (<i>that provides the administrative record</i>)</p> <p>3.4.1.2 Description of the contained information (e.g., <i>items and area covered, method of preparation</i>)</p> <p>3.4.1.3 Data sources (<i>i.e. units that provide information for the administrative record</i>)</p> <p>3.4.2 Major <u>administrative register 2</u></p> <p>[<i>Same sequence of information as above</i>]</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## APPENDIX

Table 2: Relationship with the IMF Quality Assessment Framework

IMF DQAF - Generic Framework		FAO Metadata Framework
<u>Quality Dimensions</u>	<u>Elements</u>	<u>Related Chapter</u>
0. Prerequisites of quality	0.1 Legal and institutional environment	1.1; 1.2
	0.2 Resources	
	0.3 Relevance	1.5; 2.1; 3.1
	0.4 Other quality management	1.5; 2.x.x.4
1. Assurances of integrity	1.1 Professionalism	
	1.2 Transparency	
	1.3 Ethical standards	
2. Methodological soundness	2.1 Concepts and definitions	2.x.x.1
	2.2 Scope	2.x.x.2
	2.3 Classification/sectorization	2.x.x.1
	2.4 Basis for recording	
3. Accuracy and reliability	3.1 Source data	Chapter 3
	3.2 Assessment of source data	
	3.3 Statistical techniques	2.x.x.3
	3.4 Assessment and validation of intermediate data and statistical outputs	
	3.5 Revision studies	
4. Serviceability	4.1 Periodicity and timeliness	1.3
	4.2 Consistency	
	4.3 Revision policy and practice	
5. Accessibility	5.1 Data accessibility	1.3
	5.2 Metadata accessibility	Chapters 1, 2, 3
	5.3 Assistance to users	1.4

Sources: IMF DQAF - Generic Framework (IMF 2003). FAO Metadata Framework (by authors).

## APPENDIX

Table 3: Summary of Country Reports on Metadata for National Agricultural Statistics

Input and Output of National System of Agricultural Statistics		COUNTRY																Total
		BD	BT	KH	CN	FJ	IN	ID	IR	LA	MM	NP	PK	PH	LK	TH	VN	
<b>I.</b>	<b>Major Statistical Reports and Publications</b>																	
1	- Yearbook of Agricultural Statistics	√	√	√	√	√	√		√	√	√	√	√	√		√		13
2	- Agricultural Census / Survey Reports	√	√		√				√			√			√		√	7
3	- Agricultural Prices (ad hoc / Monthly)						√	√		√				√	√	√	√	7
4	- Cost of Production Statistics	√		√			√		√					√	√			6
5	- Reports of Living Standard Survey / Labor Force Survey				√					√		√		√	√	√		6
6	- Statistical Yearbook (Agr. Chapter)	√			√							√				√	√	5
7	- Foreign Trade Statistics (Annual)							√			√	√			√	√		5
8	- Monthly Indicators of Agricultural Statistics	√					√				√	√					√	5
9	- Food Security / Warning Statistics and Analysis	√	√		√		√							√				5
10	- Quarterly Report of Agricultural Statistics					√					√			√			√	4
11	- Annual Statistical Key Indicators (Agr. Chapter)	√										√				√	√	4
12	- Annual Food Balance Sheet			√				√						√	√			4
13	- Report on Crops and Livestock Survey			√				√							√	√		4
14	- Fish Production (Annual)							√						√		√	√	4
15	- Land Use Statistics						√	√					√					3
16	- Forestry Production (Annual)							√				√					√	3
17	- Agricultural Wages						√							√				2
18	- Rural-Urban Migration		√															1
19	- Annual Rural Economic Statistics				√													1
20	- Agricultural Production, Area, and Yield						√											1
	<i>Total</i>	7	4	4	6	2	8	7	3	3	4	8	2	9	7	8	8	90

Sources: from Chapter 1 of Country Reports on Metadata for National Agricultural Statistics (FAO 2007).

## APPENDIX

Table 3: Summary of Country Reports (Cont'd)

Input and Output of National System of Agricultural Statistics		COUNTRY																
		BD	BT	KH	CN	FJ	IN	ID	IR	LA	MM	NP	PK	PH	LK	TH	VN	Total
<b>II. Major Domains and Selected Indicators of Agricultural Statistics</b>																		
1	- Production	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	16
2	- Prices	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	14
3	- Foreign Trade	√	√	√			√	√		√	√	√	√	√	√	√	√	13
4	- Agricultural Inputs	√	√	√	√		√		√		√	√	√	√		√	√	12
5	-- Land Use	√	√	√			√		√		√	√		√		√	√	10
6	-- Labor and employment	√		√	√		√				√	√		√		√	√	9
7	-- Fertilizer	√		√	√		√		√		√	√		√				8
8	-- Agricultural Machinery			√	√				√		√	√		√			√	7
9	-- Pesticides	√		√	√				√		√	√		√				7
10	-- Agricultural Credit		√				√					√				√		4
11	- Food Consumption	√		√			√	√		√		√		√	√	√		9
12	- Rural Communities and Infrastructures		√		√				√			√				√		5
Total		9	7	10	8	1	9	4	8	4	9	10	5	10	4	9	7	114

Sources: from Chapter 2 of Country Reports on Metadata for National Agricultural Statistics (FAO 2007).

## APPENDIX

Table 3: Summary of Country Reports (Cont'd)

Input and Output of National System of Agricultural Statistics		COUNTRY																Total
		BD	BT	KH	CN	FJ	IN	ID	IR	LA	MM	NP	PK	PH	LK	TH	VN	
INPUT																		
<b>III.</b>	<b>Major Data Sources for Agricultural Statistics</b>																	
1	- Agricultural Census	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	15
2	- Agricultural Sample Survey / Crop Production Survey	√	√	√	√	√		√	√	√	√	√		√	√	√	√	14
3	- Livestock Production Survey	√		√	√		√	√	√	√	√	√		√		√	√	12
4	- Cost of Production Survey			√	√	√	√		√	√				√	√	√		9
5	- Population Census	⊕		√				√			√	√	√		√		√	8
6	- Fisheries Census				√		√	√						√		√		5
7	- Household Income and Expenditure Survey	⊕		⊕	√						√	⊕						5
8	- Land Use Survey						√	√			√						√	4
9	- Crop Cutting Survey			√			√					⊕			√			4
10	- Labor Force / Wage Survey	√										√		√				3
11	- Livestock Census	√			√		√											3
12	- Socio-Economic Survey				√			√								√		3
13	- Household Living Standard / Conditions Survey				√						√	√						3
14	- Farm Prices Survey	⊕		⊕										√				3
15	- Fisheries Production Survey				√									√				2
16	- Forestry Census				√			√										2
17	- Agricultural Marketing Information Survey			⊕										√				2
18	- Household Food Security Survey										√							1
19	- Agricultural Machinery Survey							√										1
20	- Renewable Natural Resources (RNR) Survey		√															1
21	- Forestry Production Survey				√													1
22	- Agricultural Stocks Survey													√				1
23	- Rural Infrastructures Survey															√		1
	<i>Total</i>	8	3	8	12	3	7	9	4	4	8	8	2	11	5	7	5	104
24	- Major Administrative Registers / Records																	
25	- Foreign Trade Statistics													√				1

Sources: √ - from Chapter 3; ⊕ - from Chapters other than Chapter 3 of Country Reports on Metadata for National Agricultural Statistics (FAO 2007).