Food and Agriculture Organization
of the United Nations

Key Elements of a National Quality Assurance Framework for Food and Agriculture Statistics

FAO-OEA/CIE-IICA Working Group on Agricultural And Livestock Statistics for Latin America and The Caribbean

29th Session, 18-20 September

Santo Domingo (Dominican Republic)

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The 2019 UN NQAF Manual (1/3)

- The manual provides guidance for developing and implementing a national quality assurance framework (NQAF)

- Aims at assuring the quality of official statistics throughout the entire National Statistical System (NSS)

- Provides guidance for the engagement with statistics producers and data providers that are outside of the NSS that cooperate with NSS members in the production of official statistics

The 2019 UN NQAF Manual (2/3)

- The UN NQAF manual does not aim to replace any of the existing statistical quality assurance frameworks and guidelines for official statistics.

- Countries producing official statistics that are already fully engaged in quality assurance and are following one of the existing quality frameworks may view this Manual only as an additional reference point

The 2019 UN NQAF Manual (3/3)

The principles in the UN NQAF manual deal with:

- Level A: Managing the Statistical System (1-3)
- Level B: Managing the Institutional environment (4-9)
- Level C: Managing the Statistical Process (10-13)
- Level D: managing the Statistical Outputs (14-19)

They are expected to cover all the possible domains of official statistics, but some specific elements to be assured are introduces to deal with:

- Statistical processes based on the usage (and integration) of <u>different data sources</u>: admin data, geospatial data and, more in general, "big data"

- <u>Production of SDGs indicators</u>, that may require setting up new statistical processes or adaptation of existing ones, as well as coordination of different National Agencies (ministries, research institutions, etc.)

The UN NQAF: Checklist for self-assessment

The forthcoming **checklist** associate to NQAF will allow users and compilers to make their own quality assessment

i.e. assess whether the national practices are

[fully; partially; not]

compliant with each of the UN NQAF principles

The generic checklist may be too generic if the users want to make their own assessment of the statistics of specific domain (social, agriculture, national accounts, prices, etc.)

The IMF DQAF

Users interested in carrying out a self-assessment of economic statistics often apply the IMF Data Quality Assessment Framework (DQAF) approach

✓ A generic DQAF that serves as an umbrella of 7 dataset-specific frameworks:

1. National accounts statistics
2. Consumer price index
3. Producer price index
4. Government finance statistics
5. Monetary statistics
6. Balance of payments statistics
7. External debt statistics

(8) Household income in a poverty context (in collaboration with WB)

The IMF DQAF: Structure

- Quality of statistical institution
- Quality of the statistical product
- Quality of statistical processes

The DQAF has a cascading structure:

Dimension (first digit) Element (2nd digit) Indicator (3rd digit)	⇨ Generic
Focal issues Key points	⇨ Specific for each dataset

The IMF DQAF: PPI-specific DQAF (1/4)

Dimension	2. Methodological Soundness
Element	2.1 Concepts and definitions
Indicator	2.1.1 The overall structure in terms of concepts and definitions follows internationally accepted standards, guidelines, or good practices
Focal issue	ii. Output estimates are compiled at a sufficient level of industrial and commodity detail
Key points	<u>Industrial detail</u>, – at the level of all divisions of the classification (e.g., two-digit ISIC), preferably at the group (three-digit) or class (four-digit) level; and – industrial at the level of the main tabulation categories of the classification used (e.g., one-digit ISIC). <u>Commodity detail</u>, – at the level of the main tabulation categories of the classification used (e.g., one-digit CPC); – at the level of all groups and classes of the classification (e.g., two-, three-, four-, five-digit CPC) or several of them.

The IMF DQAF: PPI-specific DQAF (2/4)

Dimension	3. Accuracy & Reliability
Element	3.1 Source data *Source data available provide an adequate basis to compile statistics*
Indicator	3.1.1 Source data are obtained from comprehensive data collection programs that take into account country-specific conditions
Focal issue	i. The data collection programs employed to compile the producer price statistics are adequate
Key points	– The data sources are kept under continuous review to ensure that the data collection program is comprehensive. – The data sources of the data collection program are broadly sufficient to compile statistics. – Information from other available sources supplements core compilation

The IMF DQAF: PPI-specific DQAF (3/4)

Dimension	3. Accuracy & Reliability
Element	3.1 Source data *Source data available provide an adequate basis to compile statistics*
Indicator	3.1.1 Source data are obtained from comprehensive data collection programs that take into account country-specific conditions
Focal issue	ii. Annual statistics are collected through a regular enterprise establishment survey program for compiling PPI output weights, intermediate input weights (input price index), and product weights
Key points	– A comprehensive and up-to-date business register provides the basis for sample surveys of business units. – … – In the absence of a business register, comprehensive and up-to-date sample frames are available (for example, census list updated with new registrations). – … – Sample design ensures that the population in scope is represented properly. The sample has an appropriate division of completely enumerated and sampled strata – …

The IMF DQAF: PPI-specific DQAF (4/4)

Dimension	3. Accuracy & Reliability
Element	3.3 Statistical techniques *Statistical techniques employed conform to sound statistical procedures*
Indicator	3.1.1 Source data are obtained from comprehensive data collection programs that take into account country-specific conditions
Focal issue	ii. Appropriate measures are taken to validate the source data
Key points	– Specific procedures are developed to adjust data sources to improve the coverage, definitions, classifications, and valuation conforming to the international guidelines for PPI compilation. – Grossing-up factors are derived scientifically based on sample design

The IMF DQAF & ROSC

From 2001 the IMF Reports on the Observance of Standards and Codes (ROSCs) data modules include an assessment of data quality

ROSCs summarize the extent to which countries observe certain internationally recognized standards and codes in 12 areas (accounting; banking supervision; corporate governance; data dissemination; …)

https://dsbb.imf.org/dqrs/reports-on-the-observance

The IMF DQAF & ROSC: an Example (1/4)

Table 1. Data Quality Assessment Framework 2012—Summary Results

Key to symbols: O = Practice Observed; LO = Practice Largely Observed; LNO =Practice Largely Not Observed; NO = Practice Not Observed; NA = Not Applicable

Dimensions/Elements \ Datasets	National Accounts	Consumer Price Index	Producer Price Index	Government Finance Statistics	Monetary Statistics	Balance of Payments Statistics
0. Prerequisites of quality						
0.1 Legal and institutional environment	LO	O	O	LNO	LO	LO
0.2 Resources	LNO	LO	LO	LNO	LO	LO
0.3 Relevance	LO	O	O	LO	LO	LO
0.4 Other quality management	O	O	O	LO	LO	LO
1. Assurances of integrity						
1.1 Institutional integrity	O	O	O	LO	O	O
1.2 Transparency	O	O	O	O	O	O
1.3 Ethical standards	O	O	O	O	O	O
2. Methodological soundness						
2.1 Concepts and definitions	LO	O	LNO	LNO	O	LO
2.2 Scope	LNO	LO	LNO	LNO	LNO	LO
2.3 Classification/sectorization	LO	O	O	LNO	LO	LO
2.4 Basis for recording	LO	O	O	LO	O	LO
3. Accuracy and reliability						
3.1 Source data	LNO	LO	LO	LO	O	LO
3.2 Assessment of source data	LO	LO	LO	LO	O	O
3.3 Statistical techniques	LNO	O	O	LO	O	LO
3.4 Assessment and validation of intermediate data and statistical outputs	O	O	O	LO	LO	O
3.5 Revision studies	LO	LO	LO	LO	LO	LO
4. Serviceability						
4.1 Periodicity and timeliness	O	O	O	O	LO	O
4.2 Consistency	O	O	O	LO	O	LO
4.3 Revision policy and practice	LO	LO	LO	LO	LO	O
5. Accessibility						
5.1 Data accessibility	O	O	O	LO	O	O
5.2 Metadata accessibility	LO	LO	LO	LNO	O	LO
5.3 Assistance to users	LO	LO	LO	LO	LO	O

Practice observed: Current practices generally meet or achieve the objectives of DQAF internationally accepted statistical practices without any significant deficiencies. **Practice largely observed:** Some departures, but these are not seen as sufficient to raise doubts about the authorities' ability to observe the DQAF practices. **Practice largely not observed:** Significant departures and the authorities will need to take significant action to achieve observance. **Practice not observed:** Most DQAF practices are not met. **Not applicable**: Used only exceptionally when statistical practices do not apply to a country's circumstances.

The IMF DQAF & ROSC: Example (2/4)

Table 3c. Assessment of Data Quality—Dimensions 2 and 5—Producer Price Index			
2. Methodological soundness	**3. Accuracy and reliability**	**4. Serviceability**	**5. Accessibility**
Concepts and definitions. The concepts and definitions used in the PPI are largely in accordance with the *1993 SNA*. Following the *2004 PPI Manual*, the PPI should represent the total value of domestic production including exports; however, exports are excluded from the PPI. Conversely, import prices should be excluded from the composition of the PPI, as they do not represent domestic production. **Scope.** The PPI covers the output produced by resident enterprises in the agriculture, forestry and fishing, mining and quarrying, and manufacturing activities. The PPI does not cover relevant domestic activities (e.g., electricity and water supply, construction, and other services). **Classification/sectorization.** The classifications applied in PPI production follow international standards. Economic activities and products are classified using the *ISIC* Rev.3 classification and the CPC, respectively. **Basis for recording.** The market output of domestically produced goods is appropriately valued at producer's prices.	**Source data.** PPI weights are derived using information from supply and use tables, complemented with administrative records from the MOF and other sources. Available data do not allow for a comprehensive coverage of produced output. The periodicity and timeliness of source data is in line with international standards. **Assessment of source data.** Prices data are filtered to minimize coding and editing errors and to identify outlying price observations. Sampling errors are not routinely quantified. **Statistical techniques.** The PPI uses internationally accepted formulas both at higher and lower aggregate levels. Prices of missing products are adequately imputed using price movements of different varieties of the same product or, if the number of available observations is low, of different product varieties within the same group of the missing product. Quality adjustments are made using recommended international practices. **Assessment and validation of intermediate data and statistical outputs.** Intermediate CPI prices data are validated using comparable PPI information. **Revision studies.** The update of PPI weights is not carried out on a regular basis.	**Periodicity and timeliness.** The PPI meets the GDDS recommendations. It is compiled monthly and disseminated within five weeks after the end of the reference month. **Consistency.** PPI results are invariant to the order of aggregation used in its compilation. A consistent monthly PPI series starting in December 1995 is available on the CBP website. **Revision policy and practice.** PPI data are considered final after being produced. The impact of major revisions (e.g., weight and basket updates) are carried out without a predetermined calendar.	**Data accessibility.** The PPI is disseminated together with the CPI. An analysis of the behavior of the PPI is available in a separate section of a monthly economic report (*Informe Económico*), which is posted on the CBP website. An advance release calendar for the PPI is available on the CBP website. **Metadata accessibility.** The methodology of the current PPI is available on the CBP website. The methodology includes not only information on the characteristics of the current PPI but also historical information on the previous series. GDDS metadata had not been updated since 2004. Revised PPI metadata were posted on the DSBB in March 2014. **Assistance to users.** Publications with PPI data are posted on the CBP website. They do not identify a specific contact point were enquiries on this indicator could be made.

The IMF DQAF & ROSC: an Example (3/4)

ROSC data module ends with:

- Cross-cutting recommendations
  - High priority
  - Other key recommendations
- Dataset-specific recommendations
  - High priority
  - Other key recommendations

The IMF DQAF & ROSC: Example (4/4)

Cross-cutting recommendations

High Priority

- Give higher priority to statistical functions and promote the adoption of a modern Statistics Law that clearly assigns responsibilities among data-producing agencies.
- Provide adequate staff resources and other resources to assure the timely and sustainable compilation and dissemination of statistics in accordance with current international standards.
- Improve and institutionalize data sharing and overall coordination between the different agencies collecting source data needed for macroeconomic statistics.
- Establish regular mechanisms for enhancing intersectoral data consistency.

...

Producer Price Index

High Priority

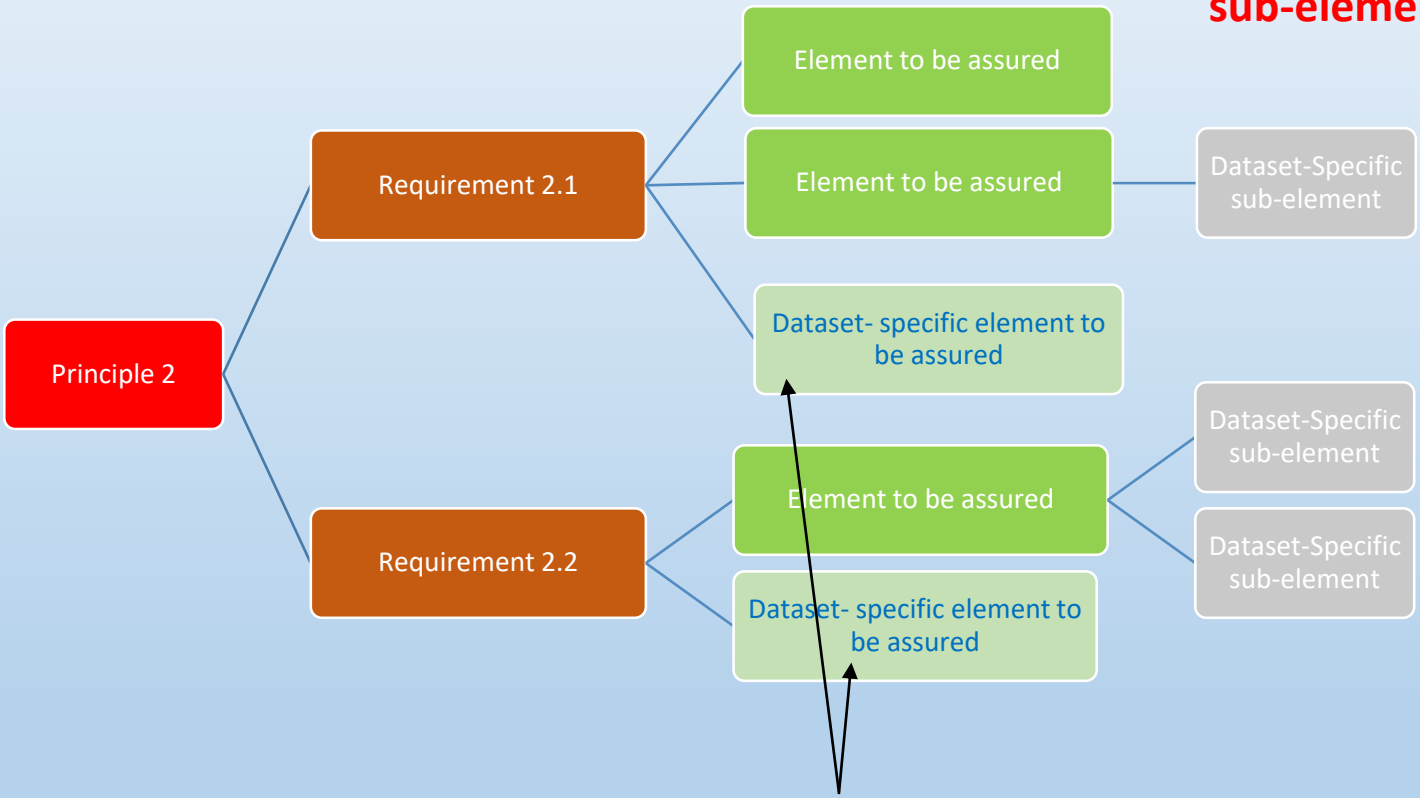
- Remove imports from PPI scope, in line with new international methodological standards.

Other key recommendations

- Expand gradually the scope of the PPI to include, at first, exports and electricity and water supply and, at a second stage, construction and services;
- Seek expert advice and promote staff training on PPI methodology.

Dataset-specific UN NQAF? (1/2)

Introduction of **dataset specific sub-elements**



augmenting the elements to be assured

Dataset-specific UN NQAF? (2/2)

Adding dataset-specific elements or sub-elements is expected to involve mainly levels C and D of 2019 UN NQAF:

- ~~Level A: Managing the Statistical System (1-3)~~
- ~~Level B: Managing the Institutional environment (4-9)~~
- Level C: Managing the Statistical Process (10-13)
- Level D: managing the Statistical Outputs (14-19)

Example Crop-Specific NQAF

Level C. Managing statistical processes

Principle 10: Assuring methodological soundness

Requirement 10.1: The methodologies applied by the statistical agencies are consistent with international standards, guidelines and good practices and are regularly reviewed and revised as needed.

Elements to be assured

- The methodologies of surveys and the use of administrative data and other sources of data are evaluated periodically.
  - Availability of satellite images for sampling, availability of remote sensing data for estimating crop area, …
- Sampling design is based on sound methodology
- Sound methods are applied to measure crop area, crop production and yield

Cf. http://gsars.org/wp-content/uploads/2019/05/Handbook-Crops.pdf

Towards an Agriculture & Food NQAF (1/2)

Advantages:

+ Would provide a reference for **self-assessment of statistical processes** and corresponding outputs in Agriculture domain

  ↳ base for improving quality of statistical outputs in the domain

+ Provides a common standard basis that facilitates dialogue between FAO and National statistical agencies

+ May incorporate many existing guidelines/standards (Global Strategy, AGRIS, etc.) as reference

+ Is not a new QAF but just a dataset-specific version of an international agreed standard (UN NQAF)

+ May represent the basis for standard reporting, i.e. the extent to which countries observe internationally recognized standards for Agriculture statistics (as for IMF ROSC)

Towards an Agriculture & Food NQAF (2/2)

Disadvantages:

- identifying dataset-specific elements or sub-elements may be difficult in cases where no internationally recognized standards exist (e.g. a classification)
- Maybe a source of heterogeneity in countries where different authorities producing agriculture statistics adopt different assessment strategies (i.e. UN NQAF and IMF DQAF)
- …

Ag & Food-specific NQAF: challenges (1/2)

Statistics in the Agriculture and Food Domains include a great variety of topics:

- Production (includes both crops and livestock)
- Post-harvest losses (--> SDGs)
- Land Use (crop; forests) (--> SDGs)
- Land ownership (--> SDGs)
- Inputs (fertilizers/pesticides; machinery; employment)
- Prices (producers/consumer) (--> SDGs)
- Government expenditure in Agriculture (--> SDGs)
- Food Security/Access (e.g. FIES) (--> SDGs)
- Water supply and use (--> SDGs)

Ag & Food-specific NQAF: challenges (2/2)

Some topics maybe more challenging than others

The topics are interrelated, e.g. agriculture production data serve as basis for compilation of food balance sheets and food security statistics

↳ Step-wise approach is needed

Collaboration between FAO HQ experts and country experts in <u>developing</u> the:

- Dataset-specific NQAF
- The associated self-assessment checklist
- Procedures and the tools

and <u>testing</u> procedure and tools

Thanks