SUSTAINABLE DEVELOPMENT GOALS

Workshop of Quality on Statistics for SDG Indicators
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Session 2: UN NQAF Manual Introduction – part 2

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UN NQAF Manual - Structure

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Recommendations	Chapter 2	Recommendations on quality assuarance for official statistics
UN NQAF	Chapter 3	The UN National Quality Assurance Framework: principles and requirements
Implementation	Chapter 4	Assessment tools and risk management
	Chapter 5	Development and implementation of a national quality assurance framework
	Chapter 6	Implementation of quality assurance within the national statistical system
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Uses the UN NQAF Manual

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Chapter 4. Assessment tools and risk management

❑ Statistical quality assessment is an important part of the overall quality management system of a statistical organization.

❑ It frequently focuses on the statistical products and the processes leading to their production but can also encompass the statistical system and institutional environment.

❑ Methods and tools for statistical quality assessment comprise

  ❑ quality indicators (both for products and processes)

  ❑ quality reports

  ❑ user surveys

  ❑ self and external assessments

  ❑ auditing (internal or external quality reviews), including peer reviews

  ❑ labelling and certification.

❑ An efficient and cost-effective use of these methods requires that they are used in combination with each other. For example, quality reports can be the basis for audits and user feedback.

Chapter 4. Assessment tools and risk management
Essential tools for quality assessment (basic level of quality assessment)

❑ **Quality indicators.** Quality indicators have to be identified (or developed) in order to measure the compliance with the respective quality principles and requirements. <u>They are specific and measurable elements of statistical practice that can be used to characterize the quality of statistics</u>.

> ❑ They measure the quality of statistical products or processes from several aspects, and for example, can give an indication of both the output (e.g. timeliness) and process quality (e.g. response rates which can be used as a proxy for accuracy).
>
> ❑ Quality indicators allow to describe and compare the quality between different statistics and over time.
>
> ❑ Quality indicators are important for process management and continuous improvement and are reflected in UN NQAF requirement 8.6.

❑ **Quality reports**. Explain and review the main characteristics of the process and its products. While a main target group of a quality report is the users of the statistics, quality reports are also an important monitoring tool for statistics producers and managers.

❑ **User surveys.** The statistical agency should regularly consult its users about their needs and perception of quality.

Chapter 4. Assessment tools and risk management
Tools for quality assessment on the next level

> ❑ Based on the information collected by the statistical agency using the tools mentioned above, the quality of the processes and products can be evaluated and eventually labelled.
>
> ❑ Evaluation can be done in the form of self-assessments, other assessments, audits or peer reviews The objective is always the identification of improvement opportunities in processes and products. Therefore, these approaches constitute an important element of the Plan-Do-Check-Act cycle (PDCA).

❑ **Self-assessments** are comprehensive, systematic and regular reviews of an organization's activities carried out by the organization (i.e. those responsible for the relevant activities) itself. The results are referenced against a model or framework. Compliance with the Fundamental Principles of Official Statistics (FPOS) has been assessed by self-assessments several times.

❑ **Other internal or external assessments:** Can also be conducted by an internal group not responsible for the assessed statistics or by an external party. The International Monetary Fund (IMF), using its Data Quality Assessment Framework (DQAF), has undertaken assessments under the Reports on the Observance of Standards and Codes (ROSCs) Data Module.

❑ **Audit**: systematic, independent and documented process for obtaining evidence and determining the extent to which quality requirements are met.

❑ **Peer reviews**: external audit carried out by others working in the same field.

Chapter 4. Assessment tools and risk management

Labelling and certification

- **The results of the assessment can be compared to defined standards and requirements. This is often referred to as the labelling or certification layer and helps to enhance trust and credibility in official statistics.**

- **Labelling** of statistics conveys a message about the extent to which a set of quality standards are met. It can be attached to statistics or a producer of statistics. The attachment of a label needs a procedure to guarantee that the message is appropriate and true.

- **Certification** is an activity which assesses whether a product, service, process or system (e.g. a quality management system) complies with requirements defined by an internationally recognized standard, or other formal criteria.

    - The result of a successful certification is that the certification body, such as the International Organization for Standardization (ISO) awards a certificate to the organization.

    - They supplement but are not alternatives to frameworks such as UN NQAF which are specifically developed for statistical agencies.

    - Certification to ISO Standards is an advanced method and tool of process quality management. It requires documentation, quality reports, quality indicators, self-assessment and audit. There are significant benefits, but also costs associated with certification.

Chapter 4. Assessment tools and risk management

Certification of statistical agencies and statistical outputs

- The NSOs may be called upon to assess and certify the quality of statistical agencies and statistical outputs of other members of the NSS (possibly to label their statistics as official) or even of statistics produced outside the NSS.

- In such cases, the NSO may develop and deploy a checklist for the assessment of statistical outputs in consultation with the concerned stakeholders.

- Such a checklist based on UN NQAF can be used as a self-assessment tool by all producers of statistics.

Chapter 4. Assessment tools and risk management

Quality management using GSBPM

❑ The improvement in quality of statistical products requires the improvement of statistical processes. The Generic Statistical Business Process Model (GSBPM) describes and defines the set of business processes needed to produce official statistics, and hereby provides a framework for process quality documentation, assessment and improvement.

Overarching processes (incl. Quality management and metadata management)							
Specify needs	Design	Build	Collect	Process	Analyse	Dissemi-nate	Evaluate

Metadata management

❑ The use and good management of metadata is essential for quality and the efficient operation of statistical processes. Metadata management can be facilitated and guided by the use of standard models such as GSBPM and Generic Statistical Information Model (GSIM).

❑ Requirements for metadata are important in UN NQAF and reflected in requirement 12.5 and 17.1 and in principle 19 on managing metadata

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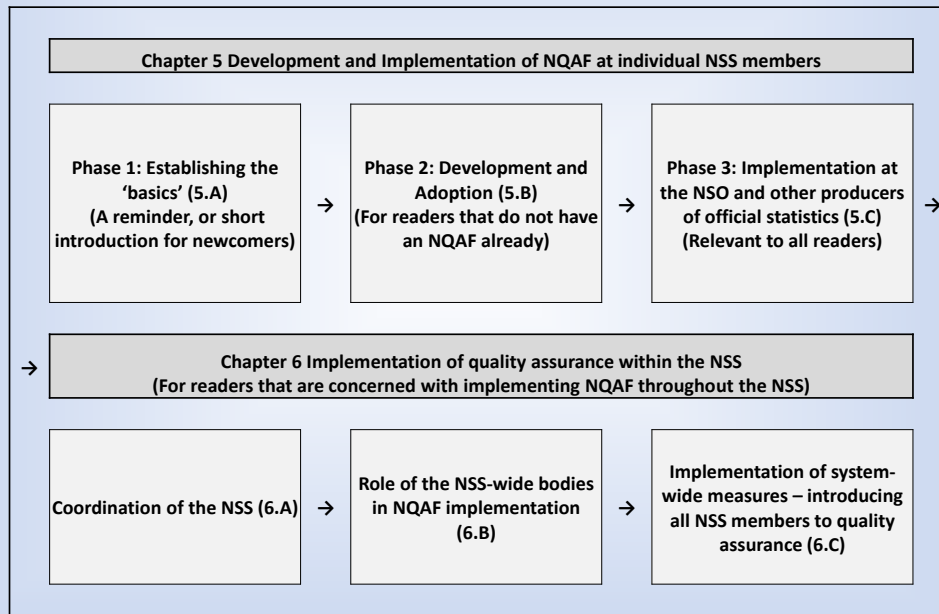# Chapter 4. Assessment tools and risk management

Risk management and the production of statistics

❑ Traditionally, risk management has been applied within financial management, security and safety.

❑ The level of risk linked to a source is defined as the product of the likelihood or probability of the event and its consequence or effect on the objective. Objectives can be defined as compliance as compliance with each quality principle, such as assuring statistical confidentiality (Principle 7) or assuring accuracy (Principle 15).

❑ The risk of errors in some statistics can be linked to risk sources such as the quality of source data, the methodology (e.g. sampling), the production system and the working processes linked to data collection, processing, analysis and dissemination.

❑ Risk analyses are particularly relevant for statistics where errors can have great impact such as for example the consumer price index, statistics on foreign trade and populations statistics.

❑ Risk and quality management frameworks are complementary and should not operate independently of each other.

Chapter 5. Development and implementation of a national quality assurance framework

Relationship between Chapter 5 and Chapter 6 - institutional arrangements and specific actions at different phases of NQAF development and implementation

Chapter 5 Development and Implementation of NQAF at individual NSS members		
Phase 1: Establishing the 'basics' (5.A) (A reminder, or short introduction for newcomers) →	Phase 2: Development and Adoption (5.B) (For readers that do not have an NQAF already) →	Phase 3: Implementation at the NSO and other producers of official statistics (5.C) (Relevant to all readers) →

→

Chapter 6 Implementation of quality assurance within the NSS (For readers that are concerned with implementing NQAF throughout the NSS)		
Coordination of the NSS (6.A) →	Role of the NSS-wide bodies in NQAF implementation (6.B) →	Implementation of system-wide measures – introducing all NSS members to quality assurance (6.C)

Chapter 5. Development and implementation of a national quality assurance framework

Phase 2: Process of NQAF development and adoption

Institutional arrangements for the development and adoption of NQAF

❑ Assumes that the NSO is leading the development of NQAF for the entire NSS although specific arrangements in countries may vary.

❑ The necessary institutional arrangements for the development of NQAF may encompass the following:

    a. High-level commitment

    b. Establishment of a quality unit at the NSO responsible for quality assurance

    c. Establishment of a quality task force (or working group). The head of the NSO would establish a quality task force which is given the responsibility to develop a NQAF

    d. NSS-wide governance body

    e. NSS-wide advisory body:

    f. Establishment of a legal framework for quality assurance

Chapter 5. Development and implementation of a national quality assurance framework

Phase 2: Process of NQAF development and adoption

Activities for the development and adoption of NQAF

❑ **Development of NQAF may be undertaken over a period of a minimum of one year, including review, revision and approval.**

❑ **The process may include the following :**

    a. **Establishment of a timetable for development and implementation.**

    b. **Review and analysis of national circumstances and practices.**

    c. **Identify Uses and users of NQAF and NQAF implementation plan.**

    d. **Compilation, review and analysis of materials available at the international level.**

    e. **Decision on the reference framework for NQAF.**

    f. **First draft of NQAF and its contents.**

    g. **Quality requirements, elements to be assured and indicators.**

    h. **Consultation and review process of the draft NQAF.**

    i. **Finalization and adoption.**

    j. **Communication and dissemination.**

Chapter 5. Development and implementation of a national quality assurance framework

Phase 3: NQAF implementation at the NSO and other producers of official statistics

Possible steps and elements of NQAF implementation

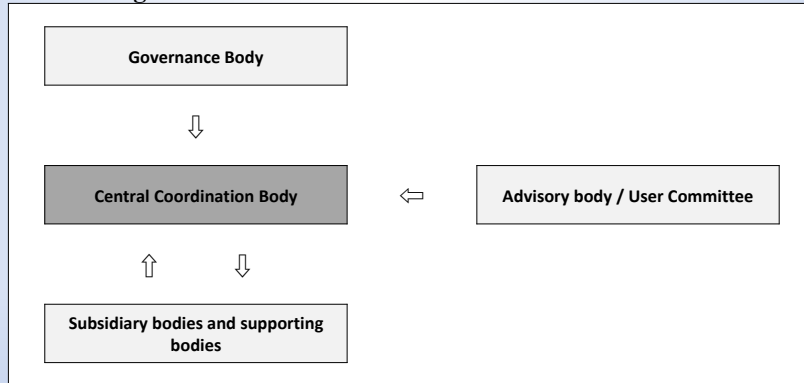| Starting point: NQAF has been developed and adopted |
| --- |
| 1 **Establish proper institutional arrangements** |
| 2 **Train staff and conduct an initial self-assessment** |
| 3 **Communicate internally and externally** |
| 4 **Develop an implementation strategy and identify implementation actions** |
| 5 **Analyze business processes and activities (using GSBPM and GAMSO)** |
| 6 **Decide on methods and tools for quality assessment that are to be used** |
| 7 **Integrate the implementation steps into the National Strategy for the Development of Statistics (NSDS) and the multi-year statistics plan** |
| 8 **Ensure ongoing commitment and seek actions with quick/visible pay-off** |

Chapter 6. Implementation of quality assurance within the national statistical system

6.A Organization and institutional arrangements of National Statistical Systems (NSSs)

❑ Need for coordination of the NSS

❑ Responsibilities of the central coordination body

❑ Centralized and decentralized NSS

6.B The role of National Statistical System-wide bodies in the implementation of NQAF

Generic organizational chart of NSS-wide bodies

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        ┌──────────────────────────┐
        │     Governance Body      │
        └──────────────────────────┘
                     ⇩

┌──────────────────────────┐        ┌──────────────────────────────┐
│ Central Coordination Body│  ⇦     │ Advisory body / User Committee│
└──────────────────────────┘        └──────────────────────────────┘
        ⇧         ⇩
┌──────────────────────────┐
│ Subsidiary bodies and    │
│  supporting bodies       │
└──────────────────────────┘
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Chapter 6. Implementation of quality assurance within the national statistical system

6.C Implementation of system-wide measures – introducing all NSS members to quality assurance

❑ Different circumstances of members of the NSS.

❑ Introducing quality assurance to all members of the NSS.

Chapter 7. Quality assurance for statistics compiled from different data sources

➢ **This chapter highlight certain aspects of quality assurance that are specific, or are of special importance, to statistics that are produced (completely or partially) using specific data sources.**

❑ This Manual distinguishes three data sources <u>according to their purpose and by the entity responsible for their compilation</u>.

❑ These are <u>statistical data sources</u> such as surveys, <u>administrative data sources</u> and <u>other data sources</u>.

  ❑ **<u>Statistical data sources</u>** are data collections created primarily for official statistical purposes by government agencies or other entities working on behalf of the government

  ❑ **<u>Administrative data sources</u>** are datasets created primarily for administrative purposes by government agencies or other entities working on the behalf of the government

  ❑ **<u>Other data sources</u>** are all datasets that are not created primarily for official statistical or administrative purposes but rather for commercial or other private purposes

Chapter 7. Quality assurance for statistics compiled from different data sources

❑ **<u>Big data</u>**: In general, other data sources include data sources associated with the term "big data" unless included already, in some instances, in statistical or administrative data sources.

❑ **<u>New data sources</u>**: New data sources can be often associated with other data sources but may as well belong to statistical or administrative data sources, depending on national circumstances.

❑ **<u>List of other data sources</u>** (no classification)

  a. Cross-country sample surveys by supra-national organizations or international enterprises;
  b. Data compiled and maintained by private professional organizations or business associations or non-profit institutions in general;
  c. Data and records compiled and maintained and/or owned by enterprises that cover large parts of the population of statistical units, in particular e-commerce. media and telecommunication providers but also other enterprises that provide services directly to individuals or businesses such as insurance companies, banks, airlines etc.;
  d. Earth observation and remote sensing;
  e. Thematic mapping and monitoring systems (e.g., field-monitoring stations for water quality, air pollution etc.);
  f. Research/scientific and pilot studies;
  g. Citizen generated data

Chapter 7. Quality assurance for statistics compiled from different data sources

Statistical data sources:

❑ The main advantage: allow data to be obtained according to specified needs and pre-defined statistical concepts.

❑ Major quality challenges:

a. High cost of production (Principle 11 - Cost-effectiveness);

b. Availability of resources (Principle 9 - Adequacy of resources);

c. Low frequency of conducting sample surveys and censuses (Principle 14 - Relevance);

d. Respondent burden and willingness of respondents to provide information (Principle 13 – Respondent burden);

e. Sampling and non-sampling errors (Principle 15 - Accuracy and reliability);

f. Need for complex sampling designs (Principle 10 - Methodological soundness);

g. The need for careful planning, implementation of instruments, training and supervision of staff and rigorous evaluation (Principle 12 – Appropriate statistical procedures).

Chapter 7. Quality assurance for statistics compiled from different data sources

Administrative data sources:

❑ The main advantage: cost-effectiveness, reduction of respondent-burden, improved timeliness, and improved relevance, accuracy and reliability due to its ability to obtain highly disaggregated data.

❑ Major quality challenges:

a. Insufficient cooperation with the providers/holders of data, frequent lack of clarity on the roles and responsibilities of different stakeholders, and legal challenges to obtain access (Principle 1 – Coordinating the national statistical system, and Principle 2 - Managing relationships with data users, data providers and other stakeholders);

b. Incoherent use or lack of use of statistical standard concepts, definitions and classifications (Principle 3 – Managing statistical standards);

c. Lack of explicit quality commitment of holders (producers) of administrative data (Principle 8 – Quality commitment);

d. The concepts that are underlying administrative data sources are not reflecting the statistical concepts that are used to measure the phenomena (Principle 14 – Assuring relevance);

Chapter 7. Quality assurance for statistics compiled from different data sources

Administrative data sources:

❑ Major quality challenges:

e. Methodological and technical difficulties in managing access to administrative data sources, performing record linkage and integrating data across multiple administrative data sources, transmitting the data and integrating them with data from statistical sources (Principle 12 – Appropriate statistical procedures);

f. Preserving security and preserving confidentiality of individual data when disseminating detailed statistics may be a challenging task (Principle 7 – Statistical confidentiality and data security);

g. Interference and bias in the statistical production process and lack of information about how the data has been produced (Principle 4 – Professional independence, Principle 5 – Impartiality and objectivity, Principle 6 – Transparency and Principle 19 – Managing metadata);

h. Under or over-coverage of the target population; mis-alignment with the statistical reference period; inherent and unquantified bias as a result of the original purpose of the administrative dataset (Principle 15 – Assuring accuracy and reliability);

i. Inability to quantify uncertainty when there are only non-sampling errors (Principle 15 – assuring accuracy and reliability).

Chapter 7. Quality assurance for statistics compiled from different data sources

Other data sources:

❑ The main advantage: opportunity to overcome resource limitations, to allow much more frequent and timely reporting, provide more objective information and, most importantly, to be able to generate data on phenomena and its aspects (dis-aggregations) that are difficult or impossible to capture with traditional statistical and administrative data sources. This leads to improved relevance. .

❑ Major quality challenges:

a. The limited access to other data sources and legal challenges regarding its access (as it can also be the case for administrative sources) requires arrangements with the data providers (e.g. government agencies, private sector and research institutions); lack of knowledge about the existence of such data; and sustainability of the source over time (Principle 2 - Managing relationships with data users, data providers and other stakeholders);

b. Incoherent use or lack of use of statistical standard concepts, definitions and classifications (Principle 3 – Managing statistical standards) that put the accuracy, reliability, coherence and comparability of the resulting statistics in question;

Chapter 7. Quality assurance for statistics compiled from different data sources

Other data sources:

❑ Major quality challenges:

c. Providers of data (which may be the owner or holder of the data) are not subject to and do not adhere to the Fundamental Principles of Official Statistics (FPOS) and associated statistical quality principles such as professional independence (Principle 4) and quality commitment (Principle 8);

d. Utilizing data for statistical purpose may potentially put the confidentiality and privacy of individuals, households and businesses at risk depending how detailed data is being published (Principle 7 – Statistical confidentiality and data security);

e. Data of sources such as those from mobile phones or social media are not representative of the entire population and may cause serious selection bias when used for statistical purposes (Principle 10 – Methodological soundness; Principle 12 – Appropriate statistical procedures and Principle 15 - Accuracy and reliability);

f. …

Chapter 7. Quality assurance for statistics compiled from different data sources

Multiple data sources:

❑ The main advantage: increasingly common in the compilation of official statistics, especially for the monitoring of the SDG; disaggregated data may be obtained through the integration with data from a different source, e.g. combining data sources may provide a higher coverage of the target population.

❑ Major quality challenges:

a. Assuring methodological soundness (Principle 10) as related to different coverage and the use of different concepts and definitions etc.;

b. Assuring appropriate statistical procedures (Principle 12) as related to having appropriate procedures, skills and knowledge to be able to link and integrate data;

c. Assuring confidentiality and data security (Principle 7);

d. Assuring coherence and comparability over time (Principle 18); the quality of the entire integration process should be assessed by calculating proper indicators;

Chapter 7. Quality assurance for statistics compiled from different data sources

Overview table: Examples of some specific elements to be assured when different data sources are used

UN NQAF Principle	Data Source	Requirements / Elements to be assured*	Explanation
		Managing the statistical system	
Principle 1: Coordinating the national statistical system	Statistical	There is a body that ensures coordination of sample surveys and their methodological soundness throughout the NSS. (1.2, 10.1)	Sample surveys should be coordinated and integrated for cost-effectiveness and methodological soundness
	Administrative	Administrative records are systematically linked with records from other relevant administrative data systems, as permitted by applicable laws (1.2, 10.1 and 11.5)	The linking of administrative data will allow the best possible use of the already available information
	Administrative Other	There is a unit that discusses and provides support for the use of administrative data sources and other data sources within the NSS (1.2, 10.1 and 11.5)	The use of administrative and other data sources poses unique challenges that should be addressed by sharing experiences and best practices

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Quality assurance of SDG indicators (Chapter 8)

- **Challenges of assuring quality of data and statistics for the SDG indicators**

- **Roles of the different entities participating in this task**

- **Requirements and elemente to be assured of special importance in this context according to the UN NQAF levels:**

  - **Managing the NSS**

  - **Managing the statistical environment**

  - **Managing the statistical processes**

  - **Managing statistical outputs**

Quality assurance in the global statistical system (Chapter 9)

The chapter describes the purpose of the global statistical system and identifies the commitments and obligations of countries and international and regional organizations to jointly assure the quality of data and statistics published at the global level.

- Monitoring of the Sustainable Development Goals (SDGs) gives this task a new urgency

- The target audience of this chapter are statisticians in countries and regional and international organizations that are interested in the relationship between national and global statistics.

- **It is recommended** to address disputes between countries and regional and international organizations regarding country data published by international or regional organizations based on professional standards required in FPOS and PGISA, the explicit guidance provided by Member States and the Statistical Commission and the quality assurance frameworks adopted by countries and international organizations.

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THANK YOU