

A DATA QUALITY ASSURANCE FRAMEWORK FOR THE OFFICIAL STATISTICAL SYSTEM OF OMAN: A First Draft and Some Issues for Consideration

Background

1. A draft *Statistics and Information Law 2015* has been prepared for the National Centre for Statistics and Information (NCSI), which is currently under consideration. The aim is to have the new law promulgated by the end of 2015.

2. Article 3.5 of the draft Law requires that all official statistics work in Oman must be conducted in accordance with a data quality framework to be promulgated:

“3.5 All official statistical activities shall be conducted in accordance with a Data Quality Framework that shall be developed by the National Centre for Statistics and Information in consultation with other government units that conduct official statistical activities. Once developed, the Data Quality Framework will be promulgated by Regulation/Royal Decree (need to specify the legal process involved)”

3. Article 3.6 of the draft Law states that:

“3.6 All conductors of official statistics must present on their Internet sites a statement of how they comply with the requirements of theData Quality Framework. This must be available within six months of the promulgation of the Data Quality Framework and must be kept up to date.”

4. Further, Article 3.7 of the draft Law states that:

“3.7 The National Centre for Statistics and Information shall support, through training and other means, other conductors of official statistics in the adoption and use of the Data Quality Framework. The National Centre for Statistics and Information shall periodically review adherence to the Data Quality Framework by other conductors of official statistics.”

5. This paper sets out some issues for consideration about the Data Quality Framework. Appendix A presents a draft of the Framework as a basis for discussion within NCSI and subsequently with all other government units that conduct official statistical activities.

6. In parallel with developing this draft Data Quality Framework for Oman, GCC-Stat will be developing a data quality framework for application across the GCC region. I will seek GCC-Stat comments on this draft material to ensure that we are not proposing something for Oman that will be inconsistent with what GCC-Stat proposes for the region as a whole.

Purpose of the Data Quality Framework

7. The draft *Statistics and Information Law 2015* recognizes that many important official statistics in Oman are the responsibility of producers other than the NCSI. It is important that decision makers and the public have confidence that, irrespective of the organization that has responsibility for the statistics, they are compiled in accordance with accepted data quality standards.

8. The purpose of the Data Quality Framework is to articulate the data quality attributes under which Oman commits to collect, compile, analyze and disseminate its official statistics. The intention is that the Framework will be publically available so that all stakeholders (government, households, businesses,

civil society, academia and the international community) understand the data quality standards underpinning the official statistics of Oman.

9. The Framework provides a common basis for managing data quality, which all conductors of official statistics in Oman can administer in their programs. The Framework provides the NCSI, as the lead agency within the Official Statistical System of Oman, with a common structure and language for consideration of data quality issues with the other official statistics producers.

10. The Framework has been developed within the context of the Code of Statistical Practice, which is also mandated under article 3.4 of the draft *Statistics and Information Law 2015*. Taken together, the Code and the Framework aim to ensure that all official statistics for Oman are compiled in accordance with the highest professional and ethical standards and to data quality standards that are internationally recognized as best practice.

International Experience

11. This section examines the international experience with the development and application of data quality frameworks to official statistics work, and attempts to draw out issues that should be considered in the development of a data quality framework for Oman.

A Brief History of Work in this Area

12. The International Monetary Fund (IMF) was possibly the first institution to work on codifying data quality issues. The IMF launched the Data Standards Initiatives to enhance member countries' data transparency and to promote their development of sound statistical systems. The need for data standards was highlighted by the financial crises of the mid-1990s, in which information deficiencies were seen to play a role. Under the Data Standards Initiatives, the IMF established the *Special Data Dissemination Standard* (SDDS) in 1996 to provide guidance to countries that have or seek access to capital markets to disseminate key data so that users in general, and financial market participants in particular, have adequate information to assess the economic situations of individual countries. In 1997, the IMF introduced the *General Data Dissemination System* (GDDS) to provide a framework for countries that aim to develop their statistical systems, within which they can work toward disseminating comprehensive and reliable data that, among other things, meet SDDS requirements.

13. The *IMF Data Quality Assessment Framework* (DQAF)¹ was developed to address the IMF's interest in data quality as expressed as early as December 1997. The DQAF grew out of the SDDS and the GDDS and provides a structure for assessing data quality by comparing country statistical practices with best practices, including internationally accepted methodologies. The DQAF was developed for at least three groups of users:

- the IMF itself -- strengthening its operational work through assessments of data quality included in data modules of the Reviews of Standards and Codes (ROSCs). These assessments have helped strengthen IMF surveillance and program design, e.g., by raising the profile of institutional weaknesses in discussions with country authorities. As well, they provide a sound basis for consideration of technical assistance (TA) needs and design of TA programs;

¹ Accessible at <http://www.imf.org/external/data.htm>

- country authorities -- enabling the self-assessment of statistical systems. Such assessments encourage preparation of well-targeted improvement plans that could help garner donor support as needed; and
- private and public data users -- providing an overview of the dimensions that make up data quality and equipping users to gauge data quality for their own purposes.

14. Statistics Canada was probably the first national statistics office to formally promulgate a data quality framework. In 2002, Statistics Canada published its *Quality Assurance Framework*² as the set of management, operating and consultative practices, procedures, and mechanisms that are used by Statistics Canada to manage the quality of its information products. This framework was developed and adapted over a period of many years, and continues to evolve. It links user needs with program products and provides for feedback, performance review, and ongoing planning and development. It gives direction and guidance to project and program managers and in turn, to their teams, to achieve overall coherence and balance within programs among what may be conflicting priorities, constraints, and design and quality issues.

15. In 2005, the *European Statistics Code of Practice*³ was promulgated by Eurostat to set the standard for developing, producing and disseminating European statistics. It builds upon a common European Statistics System definition of quality in statistics and targets all relevant areas from the institutional environment, the statistical production processes to the output of European official statistics. The Code was revised in 2011 and complemented by a *Quality Assurance Framework*⁴, which serves as guidance on how to implement the European Statistics Code of Practice.

16. Largely based on the seminal work by the IMF, Statistics Canada and Eurostat, many other international and national statistics offices have promulgated data quality frameworks⁵. Indeed, there are a considerable number of common features among them. One such common feature is the recognition that quality is best defined as “fitness for use” in terms of user needs.

17. The development of the UN *Template for a Generic National Quality Assurance Framework (NQAF)*⁶ and the Guidelines to accompany the Template was undertaken by an Expert Group on National Quality Assurance Frameworks in response to a request by the United Nations Statistical Commission at its forty-first session in 2010. The Template is intended to be used as a tool to provide the general structure within which countries that choose to do so can formulate and operationalize national quality frameworks of their own, or further enhance existing ones. At its forty-third session in 2012, the Statistical Commission fully endorsed the generic national quality assurance framework template and encouraged countries to use it. Furthermore, it asked the Expert Group to develop an action plan to

² Accessible at <http://www.statcan.gc.ca/pub/12-539-x/4147797-eng.htm>

³ Accessible at <http://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-32-11-955>

⁴ Accessible at http://ec.europa.eu/eurostat/documents/64157/4392716/qaf_2012-en.pdf/8bcff303-68da-43d9-aa7d-325a5bf7fb42

⁵ For a summary of what country and international organizations have been doing on data quality issues, see <http://unstats.un.org/unsd/dnss/qualityNQAF/nqaf.aspx>

⁶ Accessible at <http://unstats.un.org/unsd/dnss/docs-nqaf/2012-13-NQAF-E.pdf>

assist countries in the implementation of their national quality assurance frameworks and supported the proposal to pilot the generic national quality assurance framework template in some countries with different types of statistical systems.

18. The UN NQAF maps closely to the European Statistics Code of Practice, the IMF Data Quality Assessment Framework (DQAF), Statistics Canada's Quality Assurance Framework, and the Regional Code of Good Statistical Practice for Latin America and the Caribbean adopted by ECLAC⁷.

A Brief Comment on the International Work Done to Date

19. Data quality frameworks have been developed at the international/supranational level (for application within their own organizations and for application within their constituent countries) and at the country level. Clearly, what we are considering here is a data quality framework that can be applied for all official statistics in Oman.

20. Data quality frameworks also seem to have been developed along a continuum, with one of two aspects at each end of the continuum:

- as a tool to *assess* the quality of statistics once they are already available. This is very much the focus of the IMF Data Quality *Assessment* Framework (DQAF).
- as a tool to *manage* the production of statistics and the environment in which they are produced. This is the principal focus of the UN National Quality *Assurance* Framework (NQAF).

Both perspectives are perfectly legitimate and the frameworks developed to support each perspective are well considered and robust.

21. The question for the NCSI is which perspective should be given primary emphasis in the adoption of a data quality framework for the official statistics system of Oman.

A Data Quality Assurance Framework for Oman

22. To the author's knowledge, a data quality framework does not currently exist in Oman. The aim of the draft *Statistics and Information Law 2015* is to introduce formal management of data quality, and to standardize its management, across the official statistical system of Oman. In this respect, *I recommend that development of the data quality framework should be seen from the perspective of it being used as a tool to **manage** the production of statistics across the system and the environment in which they are produced.*

23. This is precisely the principal purpose of the UN NQAF. The development of the NQAF reflects the collective wisdom of the world experts in data quality issues and has been adopted by the UN Statistical Commission, which has encouraged countries to use it. It reflects contemporary thinking on data quality issues. Further, the NQAF ties in neatly with the other seminal data quality frameworks produced by the IMF, Statistics Canada and Eurostat. For these reasons, *I recommend that the UN NQAF be the basis for*

⁷ A detailed mapping of the NQAF to other frameworks is accessible at <http://unstats.un.org/unsd/dnss/qualityNQAF/nqaf.aspx>

the development of a data quality assurance framework for Oman. This is the basis upon which the subsequent work has been undertaken.

The Draft Data Quality Assurance Framework for Oman

24. A first draft of a Data Quality Assurance Framework for the Official Statistical System of Oman (OQAF is the recommended acronym) is at Appendix A. The framework recognizes that the ultimate test for the quality of a statistic is its “fitness for use” in terms of user needs. This can be gauged in terms of various dimensions: *Relevance, Timeliness, Accuracy, Coherence, Interpretability* and *Accessibility*. Meeting these quality dimensions is largely shaped by the *institutional environment* within which the statistics are compiled.

25. The *relevance* of a statistic is a qualitative assessment of the value contributed by these data, as characterized by the degree to which the statistic serves to address the purposes for which it was sought by users. It depends upon the scope and coverage of the required topics, the reference period, the geographic detail, the main outputs/data items and the use of appropriate concepts, classifications and statistical standards and the types of estimates available.

26. The *timeliness* of data products reflects the length of time between their availability and the event or phenomenon they describe, but considered in the context of the time period that permits the information to be of value and still acted upon. The concept applies equally to short-term or structural data; the only difference is the timeframe. Closely related to the dimension of timeliness, the punctuality of data products is also very important. Punctuality implies the existence of a publication schedule and reflects the degree to which data are released in accordance with it.

27. The *accuracy* of data products is the degree to which the data correctly estimate or describe the quantities or characteristics they are designed to measure. Accuracy refers to the closeness between the values provided and the (unknown) true values. Accuracy has many attributes, and in practical terms there is no single aggregate or overall measure of it. Of necessity these attributes are typically measured or described in terms of the error, or the potential significance of error, introduced through individual sources. In the case of sample survey-based estimates, the major sources of error include coverage, sampling, non-response, response, processing, and problems in dissemination. For derived estimates, such as for national accounts or balance of payments, sources of error arise from the surveys and censuses that provide source data; from the fact that source data do not fully meet the requirements of the accounts in terms of coverage, timing, and valuation and that the techniques used to compensate can only partially succeed; from seasonal adjustment; and from separation of price and quantity in the preparation of volume measures.

28. An aspect of accuracy is the closeness of the initially released value(s) to the subsequent value(s) of estimates. This is sometimes referred to as “reliability”. In light of the policy and media attention given to first estimates, a key point of interest is how close a preliminary value is to subsequent estimates.

29. The *coherence* of data products reflects the degree to which they are logically connected and mutually consistent. Coherence implies that the same term should not be used without explanation for different concepts or data items; that different terms should not be used without explanation for the same concept or data item; and that variations in methodology that might affect data values should not be made without explanation. Coherence implies the data are "at least reconcilable." For example, if two data series purporting to cover the same phenomena differ, the differences in time of recording,

valuation, and coverage should be identified so that the series can be reconciled. Coherence has four important sub-dimensions:

- *Coherence within a dataset* implies that the elementary data items are based on compatible concepts, definitions, and classifications and can be meaningfully combined. Incoherency within a dataset occurs, for example, when two sides of an implied balancing statement, such as assets and liabilities, or inflows and outflows, do not balance.
- *Coherence across datasets* implies that the data are based on common concepts, definitions and classifications, or that any differences are explained and can be allowed for. An example of incoherency across datasets would be if exports and imports in the national accounts could not be reconciled with exports and imports in the balance of payments.
- *Coherence over time* implies that the data are based on common concepts, definitions, and methodology over time, or that any differences are explained and can be allowed for. Incoherence over time refers to breaks in a series resulting from changes in concepts, definitions, or methodology.
- *Coherence across countries* implies that from country to country the data are based on common concepts, definitions, classifications and methodology, or that any differences are explained so that the user can make allowance. This aspect of coherence is assuming increasing importance in the GCC region as users are increasingly making inter-regional comparisons.

30. The *interpretability* of data products reflects the ease with which the user may understand and properly use and analyze the data. The adequacy of the definitions of concepts, target populations, variables and terminology underlying the data, and information describing the limitations of the data, if any, largely determines the degree of interpretability. The range of different users leads to such considerations as metadata presentation in layers of increasing detail. Definitional and procedural metadata assist in interpretability: thus, the coherence of these metadata is an aspect of interpretability.

31. The *accessibility* of data products reflects how readily the data can be located and accessed from within the statistics producer's data holdings. The range of different users leads to such considerations as multiple dissemination formats and selective presentation of metadata. Thus, accessibility includes the suitability of the form in which the data are available, the media of dissemination, and the availability of metadata and user support services. It also includes the affordability of the data to users in relation to its value to them and whether the user has reasonable opportunity to know that the data are available and how to access them.

32. The *institutional environment* provides the context within which the other dimensions of quality can be managed. Issues such as impartiality and objectivity, professional independence, the mandates for data collection, the adequacy of resources, the commitment to quality and the respect for statistical confidentiality can all influence the underlying quality of a statistic.

33. Consistent with the UN NQAF, the proposed Oman Quality assurance Framework has a three tier hierarchy --- *Theme; Quality Attribute; and Matters for Management Attention*.

34. Four *Themes* have been recognized:

1. Managing the statistical system
2. Managing the institutional environment
3. Managing statistical processes

4. Managing statistical outputs

35. Within each theme, *Quality Attributes* have been identified. Overall, there are 19 quality attributes, each identified by the acronym "OQAF" and a number. The Quality Attributes are as follows:

- OQAF 1.1 The national statistical system is coordinated
- OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed
- OQAF 1.3 Statistical standards are managed
- OQAF 2.1 Professional independence is assured
- OQAF 2.2 Impartiality and objectivity are assured
- OQAF 2.3 Transparency is assured
- OQAF 2.4 Statistical confidentiality and security are assured
- OQAF 2.5 The quality commitment is assured
- OQAF 2.6 Adequacy of resources is assured
- OQAF 3.1 Methodological soundness is assured
- OQAF 3.2 Cost-effectiveness is assured
- OQAF 3.3 Soundness of implementation is assured
- OQAF 3.4 Respondent burden is managed
- OQAF 4.1 Relevance is assured
- OQAF 4.2 Accuracy and reliability are assured
- OQAF 4.3 Timeliness and punctuality are assured
- OQAF 4.4 Accessibility and clarity are assured
- OQAF 4.5 Coherence and comparability are assured
- OQAF 4.6 Metadata are managed

36. The following matrix links the Themes and the Quality Attributes.

Link between the Themes and the Quality Attributes in the Proposed Oman Quality Assurance Framework (OQAF)

Theme	Quality Attribute
1. The national statistical system is coordinated	OQAF 1.1 The national statistical system is coordinated
	OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed
	OQAF 1.3 Statistical standards are managed
2. Managing the institutional environment	OQAF 2.1 Professional independence is assured
	OQAF 2.2 Impartiality and objectivity are assured
	OQAF 2.3 Transparency is assured
	OQAF 2.4 Statistical confidentiality and security are assured
	OQAF 2.5 The quality commitment is assured
	OQAF 2.6 Adequacy of resources is assured
3. Managing statistical processes	OQAF 3.1 Methodological soundness is assured
	OQAF 3.2 Cost-effectiveness is assured
	OQAF 3.3 Soundness of implementation is assured
	OQAF 3.4 Respondent burden is managed
4. Managing statistical outputs	OQAF 4.1 Relevance is assured
	OQAF 4.2 Accuracy and reliability are assured
	OQAF 4.3 Timeliness and punctuality are assured
	OQAF 4.4 Accessibility and clarity are assured
	OQAF 4.5 Coherence and comparability are assured
	OQAF 4.6 Metadata are managed

37. The third level in the hierarchy is the *Matters for Management Attention*. This constitutes a set of questions that leaders and managers at all levels and at all stages of the statistics production cycle should be asking to ensure that data quality issues are being addressed. The answer “No” to any of the questions should warrant appropriate management follow up action, as there could be real risks that data quality could be compromised to the detriment of the relevant users.

Uses of the Proposed Oman Data Quality Assurance Framework

38. As previously emphasized, the Framework is envisaged, first and foremost, as a management tool to support leaders and managers at all levels in ensuring Oman’s official statistics are fit for purpose in terms of the relevant users’ needs. It has been developed as an *ex ante* tool to identify upfront where aspects of data quality might be compromised, with the expectation that the relevant managers will take action to remedy the situation.

39. The Framework could also be used in an *ex post* way. Once a statistic has been produced, the Framework could be used to assess its underlying quality and to produce a quality report on the dataset.

40. The Framework could also be used by users to assist them in making their own judgments about the fitness for purpose of the statistics to meet their needs.

41. Finally, knowledge of the existence of the Framework, and that it is being actively used, should give Ministers, the media, academia and the public at large confidence that Oman's official statistics are of acceptable quality and have been produced in accordance with high ethical and professional standards.

42. To serve all of the above purposes, the Framework, once agreed with all stakeholders, should be made publically available. In addition, and as envisaged in the draft *Statistics and Information Law 2015*, it will be important that all producers of official statistics have on their websites an up to date statement of how they comply with the Framework.

Relationship Between the Proposed OQAF and Other Data Quality Frameworks

43. Appendix B is a matrix that shows how the proposed Oman Data Quality Assurance Framework (OQAF) links with the three seminal data quality frameworks, those of the IMF (DQAF), Statistics Canada and the European Code of Statistical Practice. The matrix reassures us that all important data quality attributes have been adequately covered in the OQAF.

Issues for NCSI Consideration

44. A threshold issue for NCSI is whether it accepts my recommendation that the Oman Data Quality Framework should be primarily designed as a management tool to *assure* data quality concerns are built into the statistical production process at the outset. If so, is NCSI happy to use the UN NQAF as the underlying organizing structure for the document? The next critical issue is that NCSI consider all three levels of the draft Framework very carefully to ensure that, as an organization, it agrees with the draft Framework and is able to observe it, *in letter and spirit*, at all three levels. If not, the Framework should be modified to reflect what can reasonably be implemented in the NCSI context.

45. Once NCSI itself is agreed with the draft Framework (modified as necessary), then the next step will be to consult with all other constituents in the Official Statistical System of Oman. The final version of the Framework can then be developed and agreed and then formally promulgated in accordance with Article 3.5 of the draft *Statistics and Information Law 2015*.

Next Steps

46. In light of the above discussion, I see the next steps as follows:

- a. Consideration of the draft Framework within NCSI, especially from the perspective as to whether it can be implemented, *in letter and in spirit*, within NCSI itself. Translate the draft Framework into Arabic.
- b. Once NCSI is agreed with the draft Framework, consult with all other constituents within the Official Statistical System of Oman; redevelop the draft Framework as necessary.
- c. Seek approval of the NCSI Board of Governors to the Framework.
- d. Formally promulgate the Framework for adoption in all official statistics work in Oman. This should be done in accordance with Article 3.5 of the *Statistics and Information Law 2015*, once that Law itself has been promulgated.
- e. NCSI develop training and other materials to support implementation of the Framework both within NCSI and by other producers of official statistics.
- f. NCSI and all other producers of official statistics publish a statement on their websites of how they comply with the Framework (within six months of its formal promulgation as required under Article 3.6 of the *Statistics and Information Law 2015*).
- g. After one year of its promulgation, NCSI commence periodic assessments of observance of the Framework (as envisaged under Article 3.7 of the *Statistics and Information Law 2015*).

47. All of the above, of course, presupposes that the draft *Statistics and Information Law 2015* is implemented, as it provides the legal underpinning for the Framework.

DRAFT as at 2 June 2015

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Introduction

1. The *Statistics and Information Law 2015* defines “official statistics” as statistics that are made available to the public by the National Centre for Statistics and Information (NCSI) or another government unit. Official statistics are fundamental to good government, to the delivery of public services and to decision-making in all sectors of society. They provide decision makers and the public with a window on Oman’s population, the society in which we live, the economy, and the environment. Official statistics also inform on the work and performance of government. Official statistics are the cornerstones of good government and a well-functioning society and economy.

2. The *Statistics and Information Law 2015* recognizes that official statistics can be collected through:

- a. a census
- b. a survey
- c. the compilation of administrative products
- d. other methods in keeping with developments in science and technology. This may include, but is not limited to, using mobile telephones and geo-positioning systems and other tracking devices; satellite imagery and other spatial information; and internet scanning and social media.
- e. combinations of the above.

3. Regardless of the method of compilation, it is critical that the range of official statistics meets the needs of users; that the statistics are produced, managed and disseminated to high standards and in a cost-effective way; and that the statistics are well explained. The majority of official statistics are produced by the NCSI, but many other government agencies produce important official statistics that inform society of the social, demographic, economic and environmental circumstances of Oman.

4. If official statistics are to serve their purpose, decision makers and the public must have confidence that the statistics are fit for the purposes for which they will be used. To this end, this Data Quality Assurance Framework for Oman’s Official Statistics, and the complementary *Code of Statistical Practice for the Official Statistical System of Oman* provide the context within which all official statistics in Oman are to be collected, compiled, analyzed and disseminated, regardless of which government agency is responsible for the statistics.

5. Article 3.5 of the *Statistics and Information Law 2015* requires that all official statistics work in Oman must be conducted in accordance with a data quality framework:

“3.5 All official statistical activities shall be conducted in accordance with a Data Quality Framework that shall be developed by the National Centre for Statistics and Information in consultation with other government units that conduct official statistical activities. Once developed, the Data Quality Framework will be promulgated by Regulation/Royal Decree (need to specify the legal process involved)”

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8. This document sets out the proposed Data Quality Assurance Framework to be used throughout the official statistical system of Oman.

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19. The *interpretability* of data products reflects the ease with which the user may understand and properly use and analyze the data. The adequacy of the definitions of concepts, target populations, variables and terminology underlying the data, and information describing the limitations of the data, if any, largely determines the degree of interpretability. The range of different users leads to such considerations as metadata presentation in layers of increasing detail. Definitional and procedural metadata assist in interpretability: thus, the coherence of these metadata is an aspect of interpretability.

20. The *accessibility* of data products reflects how readily the data can be located and accessed from within the statistics producer's data holdings. The range of different users leads to such considerations as multiple dissemination formats and selective presentation of metadata. Thus, accessibility includes the suitability of the form in which the data are available, the media of dissemination, and the availability of metadata and user support services. It also includes the affordability of the data to users in relation to its value to them and whether the user has reasonable opportunity to know that the data are available and how to access them.

21. The *institutional environment* provides the context within which the other dimensions of quality can be managed. Issues such as impartiality and objectivity, professional independence, the mandates for data collection, the adequacy of resources, the commitment to quality and the respect for statistical confidentiality can all influence the underlying quality of a statistic.

22. The Oman Quality Assurance Framework is based on the United Nations National Quality Assurance Framework and reflects best international practice in managing data quality. It has a three tier hierarchy --- *Theme; Quality Attribute; and Matters for Management Attention*.

23. Four *Themes* have been recognized:

1. Managing the statistical system
2. Managing the institutional environment
3. Managing statistical processes
4. Managing statistical outputs

24. Within each theme, *Quality Attributes* have been identified. Overall, there are 19 quality attributes, each identified by the acronym "OQAF" and a number. The Quality Attributes are as follows:

- OQAF 1.1 The national statistical system is coordinated
- OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed
- OQAF 1.3 Statistical standards are managed
- OQAF 2.1 Professional independence is assured
- OQAF 2.2 Impartiality and objectivity are assured
- OQAF 2.3 Transparency is assured
- OQAF 2.4 Statistical confidentiality and security are assured
- OQAF 2.5 The quality commitment is assured
- OQAF 2.6 Adequacy of resources is assured
- OQAF 3.1 Methodological soundness is assured
- OQAF 3.2 Cost-effectiveness is assured
- OQAF 3.3 Soundness of implementation is assured
- OQAF 3.4 Respondent burden is managed

- OQAF 4.1 Relevance is assured
- OQAF 4.2 Accuracy and reliability are assured
- OQAF 4.3 Timeliness and punctuality are assured
- OQAF 4.4 Accessibility and clarity are assured
- OQAF 4.5 Coherence and comparability are assured
- OQAF 4.6 Metadata are managed

25. The third level in the hierarchy is the *Matters for Management Attention*. This constitutes a set of questions that leaders and managers at all levels and at all stages of the statistics production cycle should be asking to ensure that data quality issues are being addressed. The answer “No” to any of the questions should warrant appropriate management follow up action, as there could be real risks that data quality could be compromised to the detriment of the relevant users.

26. The complete Framework is set out in Matrix 1 below.

Uses of the Oman Data Quality Assurance Framework

27. The Framework is envisaged, first and foremost, as a management tool to support leaders and managers at all levels in ensuring Oman’s official statistics are fit for purpose in terms of the relevant users’ needs. It has been developed as an *ex ante* tool to identify upfront where aspects of data quality might be compromised, with the expectation that the relevant managers will take action to remedy the situation.

28. The Framework could also be used in an *ex post* way. Once a statistic has been produced, the Framework could be used to assess its underlying quality and to produce a quality report on the dataset.

29. The Framework could also be used by users to assist them in making their own judgments about the fitness for purpose of the statistics to meet their needs.

30. Finally, knowledge of the existence of the Framework, and that it is being actively used, should give Ministers, the media, academia and the public at large confidence that Oman’s official statistics are of acceptable quality and have been produced in accordance with high ethical and professional standards.

Relationship Between the Oman Data Quality Assurance Framework and the Code of Statistical Practice for the Official Statistics System of Oman

31. Attachment A to this document provides a cross-link between the *Code of Statistical Practice for the Official Statistics System of Oman* and this Data Quality Assurance Framework. The Code and the Framework are mutually supporting and together are designed to support high quality official statistics in Oman.

Implementation of the Oman data Quality Assurance Framework

32. After the formal promulgation of the Framework, it must be implemented by all conductors of official statistics. Further, under Article 3.6 of the *Statistics and Information Law 2015*, all conductors of official statistics must present a statement on their internet sites of how they comply with the requirements of the Framework. This statement must be kept up to date.

33. The National Centre for Statistics and Information will collaborate with each of the other producers of official statistics in implementing the Oman Data Quality Assurance Framework in their work. Training courses and support materials are available to assist in this matter.

34. Article 3.7 of the *Statistics and Information Law 2015* requires the National Centre for Statistics and Information to undertake periodic assessments of the observance of the Framework among all producers of official statistics.

MATRIX 1: THE DATA QUALITY ASSURANCE FRAMEWORK FOR THE OFFICIAL STATISTICAL SYSTEM OF OMAN

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
1. Managing the statistical system.	<p>OQAF 1.1: The national statistical system is coordinated.</p>	<p><i>At the national statistical system level:</i></p> <ul style="list-style-type: none"> • Does a law or other formal provision establish the national statistical system and specify the members of the system and designate a coordinating body? • Is the role of the National Centre for Statistics and Information in coordinating the national statistical system embodied in the law or is it de facto? • Do the objectives of the coordinating body include: planning, implementing, coordinating, regulating and evaluating the development, production and dissemination of official statistics and ensuring their quality? • Do mechanisms exist for facilitating cooperation among the members of the national statistical system in order to improve the performance of the system? • Are mechanisms in place to facilitate the agreement, among the members of the national statistical system, on priorities for the production of statistics? • Does the coordinating body of the national statistical system set the methodological guidelines for the production of official statistics, and promote the harmonization of statistical information as well as the avoidance of duplication of work among the members? • Does the coordinating body of the national statistical system promote the

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>implementation of standards throughout the system?</p> <ul style="list-style-type: none"> • Does the coordinating body of the national statistical system promote the sharing of technical knowledge among the members of the system? • Does the coordinating body of the national statistical system facilitate the identification of good statistical practices among the members and promote their implementation? • Do guidelines exist for the exchange, among members of the national statistical system, of unit records or other data?
	<p>OQAF 1.2: Relationships with data users, data providers and other stakeholders are managed.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Has the official statistics producer clearly identified all of its stakeholders? • Is the nature of the relationships between the official statistics producer and each of its stakeholders defined and understood by both sides? • Are processes in place to consult stakeholders on their needs and concerns? • Are stakeholders kept informed on actions taken to address their needs and concerns? • Is there a multi-sector body that advises the statistical agency in setting overall statistical priorities? <p>• <i>In regard to users:</i></p> <ul style="list-style-type: none"> ➤ Are there subject-specific user committees?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> ➤ Are there arrangements in place for periodic high-level discussions with key users? ➤ Are appropriate strategies in place to service user needs through a combination of print, electronic and other services to ensure users have appropriate access to the statistics they need? • <i>In regard to data providers:</i> <ul style="list-style-type: none"> ➤ Does the official statistics producer have a provider management policy and/or a provider charter? ➤ Does the official statistics producer have a practice of regularly consulting with provider organizations such as other government departments and industry associations? ➤ Does the official statistics producer have access to records maintained by any government department, corporation, business or organization that could be used for statistical purposes? ➤ Does the official statistics producer have memoranda of understanding or other arrangements with administrative agencies to ensure that by-product administrative data provided to it will be suitable for statistical purposes? ➤ Does the official statistics producer maintain continuing liaison with the providers of administrative records to strengthen the statistical value and usage of the administrative source? • <i>In regard to the funding agency:</i>

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> ➤ Does the official statistics producer have well-documented work plans and budgets that can be shared with the funding agency to ensure mutual understanding of funding requirements and trade-offs? • <i>In regard to the media:</i> <ul style="list-style-type: none"> ➤ Does the official statistics producer have a strategy to manage media relationships and does it maintain regular contact with the media? ➤ Does the official statistics producer respond, as appropriate, to negative media reporting to ensure fair reporting of its position? ➤ Are arrangements in place to ensure that the media is able to play a role in disseminating statistics to a wide audience? • <i>In regard to other stakeholders:</i> <ul style="list-style-type: none"> ➤ Are specific policies and practices in place to manage relationships with other key stakeholders? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • <i>In regard to users:</i> <ul style="list-style-type: none"> ➤ Are processes in place for consulting with user groups when new statistics are developed or existing statistics are reviewed? ➤ Are processes in place to monitor the relevance and practical utility of existing statistics in meeting their needs? ➤ Are processes in place for users to advise statistical agencies about their emerging needs and priorities?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> ➤ Are mechanisms in place to monitor users' needs and feed them back into the design process? ➤ Are users' priority needs being met and reflected in the work program of the statistical agency? • <i>In regard to data providers:</i> <ul style="list-style-type: none"> ➤ Are processes in place for maintaining close cooperation with the interest groups of those with a duty to provide information, and whose primary concerns have the highest priority? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • <i>In regard to users:</i> <ul style="list-style-type: none"> ➤ Are user support services available to give prompt assistance to users, by knowledgeable staff, to help them access and interpret the data? ➤ Is information provided on the methodology of statistical processes and the quality of statistical outputs? • <i>In regard to data providers:</i> <ul style="list-style-type: none"> ➤ Are processes in place to assure statistical confidentiality of individuals, businesses or other entities in administrative records, and to ensure that the information will be used for statistical purposes only? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are procedures in place for stakeholders to evaluate whether a statistical product is needed (with respect to its scope, level of detail, cost, etc.)?
	OQAF 1.3: Statistical standards are managed.	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Does the agency work towards the development of statistical standards?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Does the agency actively work with other statistical organizations in developing, reviewing, promoting and implementing statistical standards? • Does the agency have an organizational unit responsible for taking the lead in the development of statistical standards and for supporting statistical programs/domains in its efforts to develop standards, where such standards do not exist or have become outdated? • Is this responsibility assigned to staff with the appropriate level of seniority? • Does the agency monitor the extent to which statistical standards are used by the statistical programs/domains? • Are all relevant staff aware of statistical standards and any changes made to them? • Do statistical standards include a statement regarding the degree to which their application is compulsory? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Does the process for originating, developing and approving statistical standards involve data users and data providers, including the agency's own statistical programs/domains? • Are agency statistical standards accompanied by a statement of conformity to corresponding international, GCC or national standards? • Are divergences from the corresponding international, GCC or national statistical standards documented and explained?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are there detailed concordances to corresponding international, GCC and national standards? • Are there detailed concordances to previous statistical standards? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Does the agency use conceptual frameworks, such as the System of National Accounts, that provide a basis for consolidating statistical information about certain sectors or geographical entities? • Does the agency develop integrated statistics programs/domains that require statistical standards? • Are statistical programs/domains held accountable to apply the statistical standards? • Do statistical programs/domains have to obtain exemptions from statistical standards if they do not apply them? • Are plans, including deadlines, for the development and application of new statistical standards communicated to statistical programs/domains well in advance (even several years)? • Do statistical programs/domains, to the extent possible, collect and retain information at the fundamental or most detailed level of each standard classification in order to provide maximum flexibility in aggregation and facilitate retrospective reclassification as needs change? • Are statistical products accompanied by, or make explicit reference to, readily

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>accessible documentation on the statistical standards used?</p> <ul style="list-style-type: none"> • Are periodic reports to senior management prepared on the extent to which statistical standards are used by the statistical programs/domains? • Are the statistical standards communicated to all potential data users and the public? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are statistical standards regularly reviewed and revised, if necessary, to ensure their quality, notably their relevance, coherence and clarity?
2. Managing the institutional environment		
	OQAF 2.1: Professional independence is assured.	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Is a law or some other formal provision in force which specifies that official statistics producers are obligated to develop, produce and disseminate statistics without interference from other government agencies or policy, regulatory or administrative departments and bodies, the private sector or any other persons or entities that may be considered as potential conflicts of interest? • If no law or formal provision exists which explicitly declares the necessity of professional independence, do traditions or cultures of professionalism, historical precedents or conventions exist that are clearly recognized as essential to the credibility of the statistical results of the statistical agencies?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are there laws, formal policies or procedures in place for dealing with actual or perceived, or potential, conflicts of interest? • Is there a culture within the statistical agency that such issues are dealt with swiftly and effectively? • Are there rules applied for appointing and dismissing the heads of statistics of the official statistics producing agencies based on professional competence, and are they free from political considerations? DELETE? • Do the processes in place ensure that the heads of statistics of the statistics producing agencies are of the highest professional caliber and have sufficiently high hierarchical standing to ensure senior level access to policy authorities and administrative public bodies? • Do the heads of statistics of the statistics producing agencies have exclusive and full control over the decisions on statistical methods, standards and procedures, and on the content and timing of statistical releases? • Does the responsibility for ensuring that statistics are developed, produced and disseminated in an independent manner rest with the heads of statistics of the statistics producing agencies? • Are procedures in place for regularly publishing the statistical work programs and for issuing periodic reports to describe progress made?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are procedures in place to ensure that statistical releases are clearly distinguished from political/policy statements and issued separately from them? • Is there a formal policy or well-established custom entitling official statistics producers to comment publicly on statistical issues, criticisms, misinterpretations and misuses of official statistics?
	<p>OQAF 2.2: Impartiality and objectivity are assured.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Is there a law or formal provision in force which specifies that official statistics producers should develop, produce and disseminate statistics following professional standards and treat all users in the same way? • Does the official statistics producer follow a declaration or code of conduct or ethics which governs statistical practices (e.g. Code of Practice, declaration on professional ethics, etc.), and if so, is its implementation followed up? • Do guidelines for assuring impartiality and objectivity exist, and if so, is the implementation of the guidelines followed up? • Is recruitment and promotion of the staff responsible for the development, production and dissemination of statistical information based on relevant aptitude and expertise in statistics and/or other relevant subject matters?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are statistics produced on an objective basis that is determined only by statistical considerations? • Are sources, concepts, methods, processes and data dissemination paths chosen on the basis of statistical considerations and national and international or GCC principles and best practices? • Does a policy for data dissemination exist and if so, is it made publicly known? • Is information made available to all users at the same time with no privileged access for governmental representatives? • In cases where privileged pre-release access is given, is it controlled and publicized? • Is there a release calendar in place in which dissemination dates and times are pre-announced? • Are any deviations from the release calendar announced and justified to the users? • Are major changes in the methodologies and data revisions clearly explained to users? • Are procedures in place to ensure that statistical releases are clearly distinguished from political/policy statements and issued separately from them? • Are statistical releases and statements made in press conferences objective and non-partisan?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> In case errors are detected, are they corrected as soon as possible and are users informed about those errors that affected the released data?
	<p>OQAF 2.3: Transparency is assured.</p>	<p>At the agency level:</p> <ul style="list-style-type: none"> Are the terms and conditions under which statistics are developed, produced, and disseminated available to the public? Is internal government access to statistics prior to their release allowed? If so, is this internal government access publicly disclosed? Is there a standard procedure for ensuring that respondents understand the legal basis for a survey and the confidentiality provisions for the data that are collected? Are products of the statistical agencies clearly identified as such? Is advance notice given of major changes in methodology, source data, and statistical techniques?
	<p>OQAF 2.4: Statistical confidentiality and security are assured.</p>	<p>At the agency level:</p> <ul style="list-style-type: none"> Is there a law or some other formal provision in force that guarantees the proper management, with regard to privacy and security, of information received from data providers? Are national privacy laws respected? (RELEVANT TO OMAN?) Where the statistics law provides for exceptions to the general confidentiality provisions, are clear policies and procedures in place to operationalize the exceptions, and are they made public?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are appropriate codes of practice and standards in place to ensure that statistical data about individual respondents remain confidential, and are only released to users in line with statistical legislation and data dissemination policies? • Do the official statistics producers have a formal data dissemination policy that sets out how statistics are to be disseminated to users and under what circumstances microdata (i.e. statistical information relating to individual respondents) may be made available for research and further analysis? • Where microdata are to be disseminated, do the statistical agencies have appropriate procedures and processes (e.g. anonymization) in place to ensure that individual respondents cannot be identified from the data? • Are appropriate penalties provided for statistical staff or other personnel who have been found guilty of activities leading to the release of confidential data? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Do statistical agencies identify in advance what data and microdata are to be disseminated and where there is a risk that confidential data about individual respondents could be identified? • Are appropriate procedures identified in advance to ensure that data and microdata are anonymized? <p><i>At the program implementation stage:</i></p>

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are appropriate processes in place to assess the risk that individual respondents can be identified from the public release of statistics or of microdata, and are procedures applied in line with the data dissemination policy to eliminate or minimize this risk? • Where there is a risk of identification of individuals from the public release of statistics or microdata, and this risk is considered to be above a minimum level, depending on the sensitivity of the data, are the data or microdata then not disseminated? • Are all procedures that are taken to eliminate or adequately reduce the risk of identification properly documented and made available as part of the metadata related to the statistical dataset? • Are users made aware that procedures to eliminate the risk of identification have been implemented and that this could lead to a loss of information? • Are appropriate physical and information technology security procedures in place to ensure the protection of unit records? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Do the official statistics producers monitor the use of microdata sets to identify any circumstances in which data confidentiality may be breached, for example, through file matching, and do they take immediate action to redress such situations?
	OQAF 2.5: The quality commitment is assured.	<i>At the agency level:</i>

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Does the official statistics producer's policy or message about its commitment to quality in statistics clearly convey and promote the shared concern for quality of all of its staff, and include information about tradeoffs affecting the statistical work program? Is this policy made public? • Is a culture of continuous improvement promoted that systematically fosters the documentation of methodology and processes and the exchange of good statistical practices, as well as the monitoring, assessment and improvement of the quality of statistical operations? • Is there a specific person or persons who have been assigned explicit responsibility for the management of quality within the official statistics producer agency? • Does the official statistics producer follow any of the externally recognized processes or activities that focus on quality? • Are guidelines for implementing quality management defined which: (a) describe the entire statistical process and identify relevant documentation for each stage of production; (b) describe the methods for monitoring the quality of each stage of the statistical production process; and (c) identify the indicators (quality measures) for evaluating the quality of the main stages of production? • Are the official statistics producer's quality guidelines made available to

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>external users, at least in a summary version?</p> <ul style="list-style-type: none"> • Are measures in place for conducting periodic quality reviews of key products to assess adherence to internal guidelines and international or GCC standards? Is top management informed of the results in order to define improvement actions? • Are procedures in place to ensure that the required documentation on quality is regularly updated? • Are staff training and development programs in place to ensure that the staff is well aware of the statistical agency's quality policy and has an understanding as to how quality may be achieved? Are the official statistics producer's internal auditors trained in auditing techniques and behavior? • Does the management of the official statistics agency ensure that compiling areas or subject matter units have access to the necessary tools and specialized methodological and technical support as needed to help implement their strategies for improving data development, production and dissemination? • Is benchmarking of key statistical processes with other official statistics agencies carried out to identify good practices? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Is a quality assurance plan or similar mechanism in place that describes the

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>working standards, the formal obligations (such as laws and internal rules) and quality control actions to prevent, monitor and evaluate errors and to control different points at each stage of the statistical process?</p> <ul style="list-style-type: none"> • Are procedures in place to monitor the quality of different stages of the statistical production, e.g. according to a quality assurance plan or similar mechanism? • Are there mechanisms in place to take users' needs into account? • Are trade-offs within quality systematically examined? <p>At the program implementation stage:</p> <ul style="list-style-type: none"> • Are there mechanisms in place to assure the quality of data collection (including the use of administrative data) and data editing? <p>At the post-collection evaluation stage:</p> <ul style="list-style-type: none"> • Are metadata and quality indicators or measures prepared and provided to users to help them assess the quality of the released data? • Are outside experts called in to conduct some of the quality reviews? • Are mechanisms in place to collect and follow up on users' reactions and feedback? • Are user satisfaction surveys implemented regularly, and are their results made public?
	<p>OQAF 2.6: Adequacy of resources is assured.</p>	<p>At the agency level:</p>

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are the financial and human resources sufficient to implement the statistical work program? • Are the available technological resources (hardware, software, etc.) sufficient to support the statistical production process? • Is resource allocation reviewed on a regular basis? • Are planning and management principles (e.g. results-based management), aimed at the optimal use of available resources and applied throughout the national statistical system? • Is a resource mobilization strategy and implementation plan in place? • Is standardization of statistical production and dissemination pursued as a way to increase efficiency and savings? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Is the program feasible given the available resources? • Does the program re-use existing methods and tools? • Does the program use data from existing sources, where appropriate? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Are the costs of each stage of the production process measured? • Are data processing operations combined with those for other outputs to increase efficiency and savings? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are the costs (human and financial) of the statistical production process accurately assessed?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Is a cost-benefit analysis conducted?
3. Managing statistical processes		
	QQAF 3.1: Methodological soundness is assured.	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Is the overall methodological framework of the official statistics producer consistent with international or GCC standards, guidelines and good practices? • If not, are divergences from international standards explained? • Are procedures in place to ensure that standard concepts, definitions and classifications are consistently applied throughout the official statistics producer agency? • Are the processes used for the development, collection, compilation and production of statistics well documented and regularly reviewed to assess their efficiency and effectiveness? • Are measures in place to ensure that the staff is recruited by the official statistics producer from the relevant disciplines and has the appropriate qualifications? • Are training and development programs in place to ensure that the staff acquires and continuously updates its methodological knowledge? • Is there cooperation with the scientific community to improve methodology and the effectiveness of the methods implemented, and to promote better tools? • Are the methodologies of surveys and the use of administrative records

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>evaluated periodically to guarantee high quality statistical outputs?</p> <ul style="list-style-type: none"> • Are there management processes in place that allow the senior management of the official statistics producer agency to be assured that sound methodological approaches have been adopted in producing the statistical outputs? • Do mechanisms exist to ensure methodological soundness and consistency throughout the national statistical system? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Are the proposed scope, concepts, definitions, classification/sectorization, and basis of recording in accordance with applicable international or GCC standards? • Has explicit consideration been given to overall trade-offs between accuracy, cost, timeliness and provider burden during the program design stage? • Has there been explicit consideration of alternative sources of data, including the availability of existing survey data or administrative records, to minimize new data collection? • Is there adequate justification for each question asked, and has there been appropriate pre-testing of questions and questionnaires in each mode of collection, while also assuring that the set of questions asked is sufficient to achieve the descriptive and analytical aims of the survey?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Is a systematic approach in place for updating the survey frame to ensure adequate coverage of the target population? • Within overall trade-offs, has there been proper consideration of sampling and estimation options and their impact on accuracy, timeliness, cost, respondent burden, and data comparability over time and across programs? • In respect of use of administrative records, is the population consistent with the statistical output requirements; are the classifications appropriate; are the underlying concepts appropriate; and are the records complete and up to date? • Are mechanisms in place to facilitate the review, by the official statistics producer, of the methodology used by an independent body that may carry out the statistical production process on behalf of the agency; are procedures also in place for the official statistics producer agency to advise the independent body on the methodology to be used? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Are appropriate instruments of implementation in place, including resource and material plans, the supervisory structure, schedules, operations, procedures and checks, training and the publicity surrounding the collection? • Are adequate measures in place for encouraging accurate response,

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>following up on non-response, and dealing with missing data?</p> <ul style="list-style-type: none"> • Are adequate quality control and quality assurance measures in place at all stages of collection and processing? • Are there appropriate arrangements in place for internal and external consistency checking of data, with corresponding correction or adjustment strategies? • Is information on costs and efficiency of operations being assembled to inform future design decisions? • Is management information available to manage and monitor all aspects of the collection? Such information might include regular reporting and analysis of response rates and completion rates; monitoring refusal and conversion rates; monitoring interviewer and respondent feedback; monitoring of edit failure rates and progress of corrective actions; monitoring the results of quality control procedures during collection and processing; monitoring of expenditures against progress, etc. • Are contingency plans in place in the event of emerging problems? • Are assessments done in respect of: coverage of the population against the target population; the sampling error when sampling is being used; non-response rates, or percentages of estimates imputed; or any other serious accuracy or consistency problems with the collection results?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are appropriate arrangements in place for post-collection evaluation to take stock of outcomes as compared with design plans, to draw out any issues upon which users should be informed, and to provide feedback for consideration in the planning for future such collections? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Has there been follow up with users to seek their views on the fitness of the statistical outputs for the purposes for which the data will be used?
	<p>OQAF 3.2: Cost-effectiveness is assured.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Do guidelines exist for assuring cost-effectiveness? • Does the official statistics producer promote and implement standardized solutions that increase effectiveness and efficiency? • Is the official statistics producer's use of resources monitored both by internal and independent external measures? • Are sample surveys used instead of censuses when it is appropriate and possible? • Are the costs of producing the statistics well documented at each stage of statistics production to assess their effectiveness? • Are the costs of producing the statistics regularly reviewed to assess optimization across the office? • Are proactive efforts made to improve the statistical potential of administrative

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>data and to limit recourse to direct surveys?</p> <ul style="list-style-type: none"> • Are administrative data used instead of sample surveys when it is appropriate and possible? • Are cost–benefit analyses carried out to determine the appropriate trade-offs in terms of data quality? • Is the respondent burden managed? • Are reports on cost-effectiveness made available to the public? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Is there a clear and documented justification for the specific program? • Before contemplating a new data collection, are there mechanisms to review whether current data sources can be utilized with minimal impact on their current purpose and quality? • Is there an ongoing review process that considers whether a particular program is still operating in the most cost-effective way to meet its stated requirements? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Is the productivity potential of information and communications technology being optimized for data collection, processing and dissemination? • Is every effort made to minimize the reporting burden consistent with the principal purposes for which the statistics will be used? • Are routine clerical operations (e.g. data capture, coding, validation) automated where possible?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Is the cost-effectiveness of every statistical survey assessed? • Do mechanisms exist for assessing whether the outputs produced meet the needs of the key users so as to justify the collection of the data?
	<p>OQAF 3.3: Soundness of implementation is assured.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Does the agency have staff selection and training programs that emphasize the importance of statistics that are fit for purpose? • Are program or project management policies and practices in place that emphasize data quality issues and management of risks to data quality? • Does the agency have practices that build in data quality checkpoints and (as appropriate) sign-offs before proceeding to subsequent stages in the statistical life cycle? • Does the agency have documented procedures for the design, development, implementation and evaluation of statistical compilations? Do these procedures give adequate attention to data quality issues? • Are there established practices for consulting with stakeholders, especially users and potential respondents, at all appropriate stages of the statistical life cycle? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Is the data collection process designed to reduce the respondent burden while increasing response rates and reducing

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>non-response bias, in particular by applying different modes of data collection (for instance a telephone-based interview in a sample survey to complement a self-enumeration process)?</p> <ul style="list-style-type: none"> • Has the data collection plan taken into consideration different sources of data such as administrative statistics instead of only traditional modes of data collection? • Is the soundness of the use of administrative data sources ensured? • Are data collection instruments (mainly questionnaires) designed to minimize coding cost and time? • Has the data collection plan taken into consideration issues relating to minority or disadvantaged groups in staff selection, training and development of data collection instruments? • Does the questionnaire design allow for automated data capture? • Is the data capture mode designed to improve accuracy and timeliness through integrating, to the extent possible, data capture with data collection or automated data capture rather than the traditional manual mode of capture? • Are edit rules streamlined in the data collection system in order to validate the data entered and allow for error corrections and quality improvement during the data capture exercise? • Are follow-up activities planned to collect support information (such as the size of

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>households or establishments, dwelling status, etc.) in order to use the information for non-response adjustment?</p> <ul style="list-style-type: none"> • Is there a sound methodology in place for imputation that has been developed based on scientific principles? • Has the staff directly involved in the implementation process (including interviewers) been consulted before developing training materials? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Are training materials and manuals carefully prepared and planned in a way that considers different alternatives for training and establishing standards for monitoring and improving interviewers' skills? • Is the list of respondents' contact information regularly updated? • Is the statistical activity properly communicated and advertised in order to increase awareness and trust among respondents? • Is the staff who is involved in data processing trained and familiar with the principles of confidentiality of data? • Is the format of the database compatible with different statistical software that is usually used for compilation and data analysis? • Are data capture and data collection instruments tested and adjusted (if required and possible) prior to the actual field operation or data collection process?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are the required unique codes and identifiers created properly for the purpose of record linkage with other sources of information? • When coding is done through an automated process, is a team of well-trained coders assigned to handle uncoded cases? • Are proper follow-up procedures planned for filling data gaps and handling inconsistencies? • Is data editing repeated after each stage of data processing, including imputation? • When weighting is required, is a weight associated to each sampled unit in the database after the data processing is completed? • Are activity and cost indicators (survey paradata) produced and properly documented in order to be used in monitoring and managing the current and future collection processes?
	<p>OQAF 3.4: Respondent burden is managed.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Is there a respondent relations or respondent burden management program? • Does a provider charter exist that spells out the rights and responsibilities of respondents? • Is there a respondent advocacy position or a respondent relations officer that is clearly separated from the data collection processes? • Are there guidelines or procedures in place for coordinating and supporting respondent management activities?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are there mechanisms in place to promote the value and use of statistics to respondents? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Are there mechanisms in place to assess the necessity to undertake a new statistical survey? • Do surveys apply sound methods to reduce or distribute response burden? • Do surveys apply statistical standards to make it easier to respond to them? • Are respondents provided with information about: the purpose of the survey (including the expected uses and users of the statistics to be produced from the survey), the authority under which the survey is taken, the collection registration details, the mandatory or voluntary nature of the survey, confidentiality protection, the record linkage plans and the identity of the parties to any agreements to share the information provided by those respondents? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Are there standard practices to respond to respondents' requests and complaints? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are assessments undertaken to ascertain if there were problematic aspects of the questionnaire design and its implementation?
4. Managing statistical outputs	OQAF 4.1: Relevance is assured.	<i>At the agency level:</i>

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are procedures in place to consult users about the content of the statistical work program? • Are strategic goals and work program plans developed in such a way that judgments are able to be made about competing user needs and are these goals and plans made public on a regular basis? • Have agreements been laid down with the main users of the statistics (e.g. with respect to what will be supplied by the agency, the product quality of the statistics, the dissemination format, etc.)? • Has a policy been formulated on the type of statistics that the agency wants to produce and does not want to (or cannot) produce? • Are procedures in place to prioritize between different users' needs in the work program? Are the data on the use of statistics analyzed to support priority setting? • Does the agency have an advisory council to advise on overall statistical priorities? • Are periodic reviews undertaken of the continuing relevance and cost-effectiveness of individual statistical programs/domains? • Is there a thorough understanding of any legal or regulatory requirements to compile particular statistics? • Is there a good understanding of the interdependencies between individual statistical programs/domains?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are procedures in place to ensure coordination, harmonization and full coverage of statistical information produced by the national statistical system? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Are mechanisms in place to identify users' needs and to describe how the data relate to their needs? • Are the users and uses to which they put the statistical products known and regularly tracked? • Are procedures in place to gather information on potential needs of users of statistics? • Are the survey objectives set out in written form specifying: the population of interest; the geographic level of detail required; the intended reference period; the frequency and timeliness; the main data items/outputs required; the type of analysis intended to be conducted on the data; and other necessary quality attributes the statistics need to meet to be consistent with users' expectations of fitness for purpose? • Is user satisfaction regularly measured and systematically followed up? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Are editing and other statistical quality control processes in place to manage operations consistent with the resultant statistics meeting users' priority needs? • Are the statistical dissemination products aligned with users' needs?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are the users informed about known gaps between the measured statistical concept and the user's concept of interest? • Are metadata described and made available to the users? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are arrangements in place for post-collection evaluations to: take stock of outcomes as compared with user needs; highlight any issues upon which users should be informed; and to provide users with ways to give feedback that can be taken into account in the planning for future such collections? • Are action plans implemented to improve relevance and meet emerging needs?
	<p>QQAF 4.2: Accuracy and reliability are assured.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Are systems for assessing and validating source data, intermediate results and statistical outputs developed and managed? • Are source data, intermediate results and statistical outputs regularly assessed and validated? • Do procedures and guidelines for data quality assessment exist, and do they address accuracy issues? • Are procedures and guidelines available on how to measure and reduce errors? • Does a revision policy that documents the principles and procedures exist and is it made public?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are explanations about the timing, reasons for and nature of revisions made available? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Is a quality assurance plan in place that describes the quality control actions to prevent, monitor and evaluate non-sampling errors? • Does the revision policy follow standard and transparent procedures in the context of each survey? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Do statistical procedures (e.g. compilation, data adjustments and transformations, and statistical analysis) employ internationally recognized statistical techniques? • Are data sources (e.g. registers) systematically checked, and are the data that are used compared with data from other sources? • Are results compared with other existing sources of information in order to ensure validity? • Is periodic quality reporting on accuracy, serving both producer and user perspectives, put in place? • Are methods and tools for preventing and reducing non-sampling errors in place and used? • Are sampling and non-sampling errors measured, evaluated and systematically documented? • Are statistical discrepancies in intermediate data assessed and investigated?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are preliminary and revised data clearly identified? • Is information on the size and direction of revisions for key indicators provided and made public? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are errors discovered in published statistics corrected at the earliest possible date and publicized? • Is an analysis of revisions performed and used to improve the statistical process? • Are the sampling and non-sampling estimates analyzed over time and improvement actions taken as a result? • Is user feedback solicited to assess the fitness for purpose of the statistics?
	<p>OQAF 4.3: Timeliness and punctuality are assured.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Is a release policy defined and published, distinguishing between different kinds of statistical outputs (press releases, statistics specific reports or tables, general publications, etc.) and their corresponding release procedures and timeliness targets? • Does the timeliness of the agency's statistics comply with IMF data dissemination standards or other relevant timeliness targets? • Are action plans developed and followed if the timeliness targets are not met? • Is there a published release calendar to announce in advance the dates that statistics (at least the major ones) are to be released? • Is the release calendar made in consultation with users?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are procedures in place to regularly monitor and evaluate the punctuality of every release as per the release calendar? • Are users informed of any divergences from the advance release calendar? • Are divergences from pre-announced times published in advance, and a new release time announced with explanations on the reasons for the delays? • Are user requirements taken into account when the periodicity of the statistics is being decided? • Are statistics made available to all users at the same time? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Is explicit consideration given to overall trade-offs between timeliness and other dimensions of quality (e.g. accuracy, cost and respondent burden) during the program design stage? • Is consideration regularly given to the possibility and usefulness of releasing preliminary data, while at the same time taking into account the data accuracy? • Are contingency plans in place in the event of emerging problems that could delay the release of data? • Has an attainable schedule been defined for the production processes? • Is the maximum acceptable amount of time that can elapse - between the end of the reference period and the availability of the data – specified and known to staff and users?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Are there agreements on the planned delivery dates with data providers? • Are procedures in place to ensure the effective and timely flow of data from providers? • Are follow-up procedures in place to ensure timely receipt of data? • When preliminary data are released, are they clearly identified as such, and are users provided with appropriate information to be able to assess the quality of the preliminary data? • Does a published policy exist that describes the revisions for those key outputs that are subject to scheduled revisions? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are quality indicators on timeliness and punctuality regularly calculated, monitored, published and followed up?
	<p>OQAF 4.4: Accessibility and clarity are assured.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Are policies and processes in place to ensure that the statistical results are released with readily accessible and up-to-date documentation on concepts, scope, classifications, basis of recording, data sources, compilation methods, statistical techniques, etc. to allow for a better understanding of the data? • Are statistics and the corresponding metadata presented, and archived, in a form that facilitates proper interpretation and meaningful comparisons?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are guidelines available to authors of statistical publications/databases that describe the appropriate content and preferred formats and style (layout and clarity of text, tables, and charts) of the agency's outputs? • Are staff training and development programs in place on writing about statistics (for press releases, publication highlights or other explanatory texts)? • Is the regular production of up-to-date methodological documents (on concepts, scope, classifications, basis of recording, data sources, compilation methods and statistical techniques), as well as quality reports, part of the work program of the official statistics agency, and are the documents and reports made available to the public? • Does a data dissemination strategy and policy exist, as well as a clear pricing policy (if applicable) governing the dissemination, and are the policies made public? • Is modern information and communication technology used for dissemination (i.e. statistical databases and the agency's website as the main means of dissemination of statistics) in addition to traditional hard copy when appropriate? • Are users able to generate their own tables in the most appropriate formats (xls, html, etc.)?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are the statistics disseminated in ways that facilitate re-dissemination by the media? • Does the agency consult users on a regular basis to find out about the formats of dissemination that they most prefer? • Are catalogues of publications and other services made available? • Is there a well-publicized information or user support service, center or hotline available for handling requests for data and for providing answers to questions about statistical results? • Is the public made aware that custom-designed outputs, statistics not routinely disseminated, and longer time series can be provided on request when feasible, and are they instructed how the data can be ordered? Are these outputs made public where possible? • Is access to microdata allowed for research purposes, subject to specific rules and protocols on statistical confidentiality that are posted on the agency's website? • Does the agency control or monitor the access by researchers to microdata by providing them in a secure environment? • Are remote access facilities also available for accessing microdata, with appropriate controls? • Are researchers consulted regularly about the effectiveness of the microdata access arrangements? <p><i>At the program design stage:</i></p>

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Has explicit consideration been given to trade-offs between accessibility and confidentiality during the program design stage? • Has a strategy been developed and agreed upon with stakeholders for the release of data, metadata and (possibly) microdata from the data collection? • Are processes in place to ensure that metadata are documented according to standardized metadata systems, and regularly updated? • Are procedures in place to ensure that any differences from internationally or GCC accepted standards, guidelines, or good practices are consistently annotated? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Is the mix of printed publications, electronic releases and data available on request considered to be appropriate, given the principal user needs? • Are statistics presented in a clear and understandable manner? • Are the explanatory texts that accompany the data reviewed for clarity and readability? • Are meaningful comparisons included in the publications, when appropriate? • Are the users informed about the methodology of the statistical processes and the use of administrative data? • Are different levels of metadata detail made available to users to meet their requirements?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • When preliminary data are released, are they clearly identified as such, and are users provided with appropriate information to be able to assess the quality of the preliminary data? • Are preliminary and revised data identified? • Are policies in place for archiving statistics and metadata? <p>At the post-collection evaluation stage:</p> <ul style="list-style-type: none"> • Are assessments undertaken to ensure that the dissemination arrangements are meeting user needs? • Are user-oriented quality reports made available for statistical results to keep users informed about the quality of the statistical outputs?
	<p>OQAF 4.5: Coherence and comparability are assured.</p>	<p>At the agency level:</p> <ul style="list-style-type: none"> • Are procedures or guidelines in place to ensure and monitor internal coherence (e.g. observance of arithmetic and accounting identities) and consistency? • Are procedures or guidelines in place to ensure and monitor cross-sector coherence and consistency? • Are statistics kept comparable (availability of time series) over a reasonable period of time? • Is there a common repository of concepts, definitions and classifications available or do other mechanisms exist to promote coherence and consistency? • Do common standards exist with regard to definitions, units and classifications in order to enhance the comparability of the statistics?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Is compliance with international, GCC or national standards for statistical production periodically assessed? • Are deviations from international, GCC or national standards made explicit and are users informed about the reasons for such deviations? • To what extent is it possible to compare statistics derived from different sources or with different periodicities (e.g. monthly, quarterly and yearly)? Are any differences explained and reconciled? • Is cooperation and the exchange of knowledge between individual statistical programs/domains promoted? <p><i>At the program design stage:</i></p> <ul style="list-style-type: none"> • Are specific procedures and guidelines for individual statistical programs/domains available to ensure that outputs obtained from complementary sources are properly combined? • Are the international and national standards concerning definitions, units and classifications known and followed? • Is the common repository of concepts, definitions and classifications consulted when designing a new individual statistical program/domain? • Have the major related statistics been analyzed before designing a new individual statistical program/domain? <p><i>At the program implementation stage:</i></p> <ul style="list-style-type: none"> • Are process-specific procedures and guidelines available to ensure that outputs are internally coherent?

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<ul style="list-style-type: none"> • Are changes in methods clearly identified and measured to facilitate reconciliation? • Are breaks in the series explained and the methods for ensuring reconciliation over a period of time made publicly available? <p><i>At the post-collection evaluation stage:</i></p> <ul style="list-style-type: none"> • Are the effects of changes in methodologies on final estimates assessed and is appropriate information provided to users? • Are statistical outputs compared with other statistical or administrative sources that provide the same or similar information on the same subject matter, and are divergences identified and explained to users? • Does quality reporting include a section on the assessment of internal consistency and comparability over time and with other subject matter related statistics?
	<p>OQAF 4.6: Metadata are managed.</p>	<p><i>At the agency level:</i></p> <ul style="list-style-type: none"> • Is the metadata management system of the official statistics producer well defined and documented? • Are procedures or guidelines in place for metadata maintenance and dissemination? • Are metadata documented according to standards? • Is a glossary of statistical concepts publicly available? • Are staff training and development programs in place on metadata

THEME	QUALITY ATTRIBUTE	MATTERS FOR MANAGEMENT ATTENTION
		<p>management and related information and documentation systems?</p> <ul style="list-style-type: none">• Is there a systematic way for archiving metadata that also ensures that they are accessible for reuse in the future?

ATTACHMENT A

RELATIONSHIP BETWEEN THE CODE OF STATISTICAL PRACTICE FOR THE OFFICIAL STATISTICAL SYSTEM OF OMAN AND THE DATA QUALITY ASSURANCE FRAMEWORK

CODE OF STATISTICAL PRACTICE DIMENSION AND ELEMENT		QUALITY ATTRIBUTE IN THE DATA QUALITY ASSURANCE FRAMEWORK
DIMENSION	ELEMENT	
1. RELEVANCE <i>Official statistics meet the needs of government, business and the community, within available resources.</i>	1.1: Institutional arrangements. Official statistics producers need to have effective ways to help them understand the key uses of their outputs, and the key areas of emerging demand and unmet need.	OQAF 1.1 The national statistical system is coordinated. OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed. OQAF 4.1 Relevance is assured.
2. OTHER ELEMENTS OF QUALITY <i>Official statistics are produced using sound statistical methodology and relevant and reliable data sources, and are appropriate for the purpose.</i>	2.1: Professionalism. Professional competence validates all official statistics activity. It is enhanced through training, research and reference to good international and GCC practice and professional expertise.	OQAF 1.1 The national statistical system is coordinated. OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed. OQAF 2.1 Professional independence is assured. OQAF 2.2 Impartiality and objectivity are assured. OQAF 2.5 The quality commitment is assured.
	2.2: Good management practice. Statistical development activity and work processes are managed effectively.	OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed. OQAF 1.3 Statistical standards are managed. OQAF 2.5 The quality commitment is assured. OQAF 2.6 Adequacy of resources is assured. OQAF 3.2 Cost-effectiveness is assured.
	2.3: Continuous improvement. A culture of continuous improvement, through sharing good ideas and evaluation, is systematically fostered to manage and improve the quality of statistics.	OQAF 2.5 The quality commitment is assured.
	2.4: Accuracy. Source data and statistical techniques are sound and statistical outputs describe the reality they are designed to	OQAF 4.2 Accuracy and reliability are assured.

CODE OF STATISTICAL PRACTICE DIMENSION AND ELEMENT		QUALITY ATTRIBUTE IN THE DATA QUALITY ASSURANCE FRAMEWORK
DIMENSION	ELEMENT	
	represent. A statistic with a high level of error is unlikely to meet the standard of relevance.	
	2.5: Timeliness. Data are released within a time period that permits the information to be of value to users.	OQAF 4.3 Timeliness and punctuality are assured.
	2.6: Consistency. Statistics are consistent and coherent within the dataset, over time and with other major datasets.	OQAF 4.5 Coherence and comparability are assured.
	2.7: Interpretability. Processes and methods used to produce official statistics, including measures of quality, are fully documented and are available for users to understand the data and judge quality of fit.	OQAF 4.4 Accessibility and clarity are assured.
3: FRAMEWORKS, STANDARDS AND CLASSIFICATIONS <i>The value of statistical data is maximized through use of common frameworks, standards and classifications.</i>	3.1: Common frameworks. Common statistical frameworks, standards and classifications are promoted and used in statistical surveys and sources to provide consistency over time and between datasets.	OQAF 1.3 Statistical standards are managed.
	3.2: Standard practice. Official statistics producers use standard practices and approaches across official statistics.	OQAF 3.1 Methodological soundness is assured. OQAF 3.3 Soundness of implementation is assured.
	3.3: National, GCC-wide and international comparability. Common statistical frames, definitions and classifications align wherever possible with national, GCC-wide and international frameworks and classifications to facilitate meaningful comparison of data between countries.	OQAF 1.3 Statistical standards are managed.
	3.4: Promoting common standards. The NCSI supports other producers of official statistics to use standard practices and approaches across official statistics, and fosters a culture that encourages their adoption.	OQAF 1.3 Statistical standards are managed.

CODE OF STATISTICAL PRACTICE DIMENSION AND ELEMENT		QUALITY ATTRIBUTE IN THE DATA QUALITY ASSURANCE FRAMEWORK
DIMENSION	ELEMENT	
4: RESPONDENT MANAGEMENT <i>The costs of compliance are kept to an acceptable level and data are collected only when the expected benefits of collection exceed the cost to providers.</i>	4.1: Respondent load. Official statistics producers contribute to the active management of respondent burden across the Official Statistical System of Oman.	OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed. OQAF 3.4 Respondent burden is managed.
	4.2: Collection value. The need to collect data is assessed to determine its value to inform decision making against the costs of production and the load placed on respondents.	OQAF 3.4 Respondent burden is managed.
	4.3: Using administrative data or other methods. Wherever possible, administrative data or other existing survey data or other methods are used.	OQAF 3.4 Respondent burden is managed.
	4.4: Data sources. The best-supplier principle is applied. Data are always collected from the most appropriate source after considering respondent load and cost.	OQAF 3.1 Methodological soundness is assured. OQAF 3.4 Respondent burden is managed.
	4.5: Reducing load. A continuous effort is made to develop statistical techniques that reduce the burden on providers, while maintaining desired quality levels.	OQAF 3.4 Respondent burden is managed.
	4.6: Data collection methods. Data collection instruments are respondent-friendly.	OQAF 3.4 Respondent burden is managed.
	4.7: Effective communication. Official statistics producers recognize the impact of effective communication on response rates and quality, and actively involve respondents during the collection process. This includes demonstrating the value of the information.	OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed. OQAF 2.3 Transparency is assured. OQAF 3.4 Respondent burden is managed.
	4.8: Participation by minority or disadvantaged groups. Official statistics producers engage with minority or disadvantaged groups to ensure that they participate	OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed.

CODE OF STATISTICAL PRACTICE DIMENSION AND ELEMENT		QUALITY ATTRIBUTE IN THE DATA QUALITY ASSURANCE FRAMEWORK
DIMENSION	ELEMENT	
	actively in all aspects of official statistics.	
5: CONFIDENTIALITY, PRIVACY AND SECURITY <i>Respondents' rights to privacy and confidentiality are respected and their information is stored securely.</i>	5.1: Legal and ethical obligations. Legislative and ethical obligations governing the collection of data, confidentiality, privacy and release of outputs are rigorously followed.	OQAF 2.3 Transparency is assured. OQAF 2.4 Statistical confidentiality and security are assured.
	5.2: Awareness of obligations. Everyone involved in the production of official statistics is aware of their obligation to protect confidentiality and of the legal penalties for wrongful disclosure.	OQAF 2.4 Statistical confidentiality and security are assured.
	5.3: Use for statistical purposes. Survey data provided by respondents are only used for statistical purposes. Administrative data, whilst primarily collected for operational purposes, can also be used for statistical purposes.	OQAF 2.3 Transparency is assured. OQAF 2.4 Statistical confidentiality and security are assured.
	5.4: Managing privacy concerns. Respondents' privacy concerns are minimized.	OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed. OQAF 2.4 Statistical confidentiality and security are assured.
	5.5: Preserving confidentiality. Respondents' confidentiality is always strictly preserved unless they have explicitly agreed to the contrary.	OQAF 2.4 Statistical confidentiality and security are assured.
	5.6: Security. Secure practices and processes are used in the production of official statistics.	OQAF 2.4 Statistical confidentiality and security are assured.
	5.7: Administrative data. Unless specific permission in legislation allows otherwise, the same confidentiality standards will apply to statistics derived from administrative sources collected for statistical purposes	OQAF 2.4 Statistical confidentiality and security are assured.

CODE OF STATISTICAL PRACTICE DIMENSION AND ELEMENT		QUALITY ATTRIBUTE IN THE DATA QUALITY ASSURANCE FRAMEWORK
DIMENSION	ELEMENT	
6: RELEASE PRACTICES <i>Access to official statistics is equal and open.</i>	6.1: Accessibility. Official statistics producers will ensure equality of access.	OQAF 4.4 Accessibility and clarity are assured.
	6.2: Presentation and dissemination. Statistics are presented in an understandable manner and are widely disseminated.	OQAF 4.4 Accessibility and clarity are assured. OQAF 4.6 Metadata are managed.
	6.3: Release of official statistics. Release of official statistics is by the Chief Executive Officer of the producing agency according to a calendar of release dates published at least six months in advance.	OQAF 2.1 Professional independence is assured. OQAF 4.4 Accessibility and clarity are assured.
	6.4: Pre-release security. Before release, unit record data, administrative data, and aggregate results are secure.	OQAF 2.4 Statistical confidentiality and security are assured.
	6.5: Unbiased reporting. Statistical information is presented clearly and impartially, without advocacy or unsubstantiated judgment, and supported by commentary and analysis to enable wide understanding.	OQAF 2.2 Impartiality and objectivity are assured.
	6.6: Unambiguous presentation. Statistics are easy to understand and presented in ways that do not mislead. Statistical commentary, tables, maps and graphs are compiled with a view to their general interest value.	OQAF 4.4 Accessibility and clarity are assured. OQAF 4.5 Coherence and comparability are assured.
	6.7: Errors in published data. Errors in published statistics should be removed and corrected as soon as practicable and in a transparent manner.	OQAF 2.3 Transparency is assured. OQAF 4.2 Accuracy and reliability are assured.
	6.8: Revisions. Revisions are as accurate, robust and freely available as new statistics, and are accompanied by relevant supporting and explanatory information.	OQAF 2.3 Transparency is assured. OQAF 4.2 Accuracy and reliability are assured.
7: MANAGEMENT, DOCUMENTATION AND	7.1: Data retention policy. Official statistics producers have a data	OQAF 3.3 Soundness of implementation is assured.

CODE OF STATISTICAL PRACTICE DIMENSION AND ELEMENT		QUALITY ATTRIBUTE IN THE DATA QUALITY ASSURANCE FRAMEWORK
DIMENSION	ELEMENT	
<p>PRESERVATION OF STATISTICAL RECORDS <i>Official statistics are treated as an enduring national resource used for the benefit of all society.</i></p>	<p>management policy to govern the management of their statistical resources, ensuring that the statistics are accessible for use by present and future generations.</p>	
	<p>7.2: Data custodians. Responsibility for managing the complete life-cycle of each statistical resource is vested in one or more identifiable data custodians.</p>	<p>OQAF 3.3 Soundness of implementation is assured.</p>
	<p>7.3: Contextual documentation. Processes and methods used to produce official statistics are documented, to give statistics context, and are readily accessible.</p>	<p>OQAF 2.3 Transparency is assured. OQAF 4.6 Metadata are managed.</p>
	<p>7.4: Protection of statistical resources. Official statistics producers protect the integrity and security of their statistical resources, and minimize the risk of loss, deterioration or disclosure.</p>	<p>OQAF 3.3 Soundness of implementation is assured OQAF 4.6 Metadata are managed</p>
	<p>7.5: Historic preservation. Records of long-term archival or informational value are retained, subject to security, confidentiality and statutory obligations.</p>	<p>OQAF 3.3 Soundness of implementation is assured OQAF 4.6 Metadata are managed</p>

APPENDIX B

**RELATIONSHIP BETWEEN THE PROPOSED OMAN DATA QUALITY ASSURANCE FRAMEWORK
(OQAF) AND OTHER DATA QUALITY FRAMEWORKS**

RELATIONSHIP BETWEEN THE PROPOSED OMAN DATA QUALITY ASSURANCE FRAMEWORK (OQAF) AND OTHER DATA QUALITY FRAMEWORKS

The matrix below shows the relationship between the proposed Oman Data Quality Assurance Framework and those developed by the International Monetary Fund (the Data Quality Assessment framework (DQAF)), Statistics Canada and the European Code of Statistical Practice.

Oman Data Quality Assurance Framework (OQAF)	IMF Data Quality Assessment Framework (DQAF)	Statistics Canada Quality Assurance Framework	European Statistics Code of Practice (CoP)
1. Managing the statistical system			
OQAF 1.1 The national statistical system is coordinated	DQAF. 0.1.1 DQAF. 0.1.2	CAN 2	CoP. 2.1 CoP. 2.2 CoP. 2.3 CoP. 3.3 CoP. 3.4
OQAF 1.2 Relationships with data users, data providers and other stakeholders are managed	DQAF. 5.3.1	CAN 1	CoP. 2.3 CoP. 7.7 CoP. 9.1 CoP. 9.2 CoP. 9.3 CoP. 9.4 CoP. 9.5 CoP. 9.6 CoP. 11.1 CoP. 11.2 CoP. 11.3 CoP. 15.6 CoP. 15.7
OQAF 1.3 Statistical standards are managed	DQAF. 3.1.2	CAN 11	CoP. 7.1 CoP. 7.2 CoP. 10.4 CoP. 14.3 CoP. 15.5
2. Managing the institutional environment			
OQAF 2.1 Professional independence is assured	DQAF. 1.1.2 DQAF. 1.1.3	CAN 12	CoP. 1.1 CoP. 1.2 CoP. 1.3 CoP. 1.4 CoP. 1.5 CoP. 1.6 CoP. 1.7 CoP. 1.8

Oman Data Quality Assurance Framework (OQAF)	IMF Data Quality Assessment Framework (DQAF)	Statistics Canada Quality Assurance Framework	European Statistics Code of Practice (CoP)
OQAF 2.2 Impartiality and objectivity are assured	DQAF. 1.1.1	CAN 12	CoP. 6.1 CoP. 6.2 CoP. 6.3 CoP. 6.4 CoP. 6.5 CoP. 6.6 CoP. 6.7 CoP. 6.8
OQAF 2.3 Transparency is assured	DQAF. 1.2.1 DQAF. 1.2.2 DQAF. 1.2.3 DQAF. 1.2.4	CAN12	CoP. 6.3 CoP. 6.4 CoP. 6.5 CoP. 6.6 CoP. 8.6
OQAF 2.4 Statistical confidentiality and security are assured	DQAF. 0.1.3	CAN12	CoP. 5.1 CoP. 5.2 CoP. 5.3 CoP. 5.4 CoP. 5.5 CoP. 5.6
OQAF 2.5 The quality commitment is assured	DQAF. 0.4.1 DQAF. 0.4.2 DQAF. 0.4.3	CAN 12	CoP. 4.1 CoP. 4.2 CoP. 4.3 CoP. 4.4
OQAF 2.6 Adequacy of resources is assured	DQAF. 0.2.1	CAN 12	CoP. 3.1 CoP. 3.2 CoP. 3.3 CoP. 3.4
3. Managing statistical processes			
OQAF 3.1 Methodological soundness is assured	DQAF. 2.1 DQAF. 2.2 DQAF. 2.3 DQAF. 2.4	CAN 4 CAN 11	CoP. 7.1 CoP. 7.2 CoP. 7.3 CoP. 7.4 CoP. 7.5 CoP. 7.6 CoP. 7.7 CoP. 8.2 CoP. 8.3 CoP. 8.4 CoP. 8.5

Oman Data Quality Assurance Framework (OQAF)	IMF Data Quality Assessment Framework (DQAF)	Statistics Canada Quality Assurance Framework	European Statistics Code of Practice (CoP)
			CoP. 8.6
OQAF 3.2 Cost-effectiveness is assured	DQAF. 0.2.2		CoP. 10.1 CoP. 10.2 CoP. 10.3 CoP. 10.4
OQAF 3.3 Soundness of implementation is assured	DQAF. 3.1.1 DQAF. 3.3.1 DQAF. 3.3.2		CoP. 8.1 CoP. 8.2 CoP. 8.3 CoP. 8.4 CoP. 8.5 CoP. 8.7 CoP. 8.8 CoP. 8.9
OQAF 3.4 Respondent burden is managed	DQAF. 0.1.4	CAN 10	CoP. 8.7 CoP. 8.8 CoP. 8.9 CoP. 9.1 CoP. 9.2 CoP. 9.3 CoP. 9.4 CoP. 9.5 CoP. 9.6
4. Managing statistical outputs			
4.1 Relevance is assured	DQAF. 0.3.1	CAN 3	CoP. 11.1 CoP. 11.2 CoP. 11.3
4.2 Accuracy and reliability are assured	DQAF. 3.2.1 DQAF. 3.4.1 DQAF. 3.4.2 DQAF. 3.4.3 DQAF. 3.5.1 DQAF. 4.3.1 DQAF. 4.3.2 DQAF. 4.3.3	CAN 4	CoP. 8.6 CoP. 12.1 CoP. 12.2 CoP. 12.3
4.3 Timeliness and punctuality are assured	DQAF. 3.1.3 DQAF. 4.1.1 DQAF. 4.1.2 DQAF. 5.1.3	CAN 5	CoP. 13.1 CoP. 13.2 CoP. 13.3 CoP. 13.4 CoP. 13.5

Oman Data Quality Assurance Framework (OQAF)	IMF Data Quality Assessment Framework (DQAF)	Statistics Canada Quality Assurance Framework	European Statistics Code of Practice (CoP)
4.4 Accessibility and clarity are assured	DQAF. 5.1.1 DQAF. 5.1.2 DQAF. 5.1.4 DQAF. 5.1.5 DQAF. 5.2.1 DQAF. 5.2.2 DQAF. 5.3.2	CAN 6 CAN 7	CoP. 15.1 CoP. 15.2 CoP. 15.3 CoP. 15.4 CoP. 15.5 CoP. 15.6 CoP. 15.7
4.5 Coherence and comparability are assured	DQAF. 4.2.1 DQAF. 4.2.2 DQAF. 4.2.3	CAN 8	CoP. 14.1 CoP. 14.2 CoP. 14.3 CoP. 14.4 CoP. 14.5
4.6 Metadata are managed		CAN 13	CoP. 15.1 CoP. 15.5