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**Expert Group Meeting on the International Recommendations for Water Statistics  
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## **Summary of recommendations and conclusions**

## Introduction

1. The Expert Group Meeting (EGM) on the International Recommendations for Water Statistics (IRWS) was held 4-6 November, in New York. The objectives of the meeting were to: (a) discuss the draft chapters of the IRWS; (b) identify issues that need to be resolved; (c) agree on how to address them; (d) discuss the proposed structure and content of compilation guidelines for water statistics and accounts; (e) identify country experiences and practices that can be included in the compilation guidelines.
2. To assist the EGM, a draft of the IRWS was circulated in October, in two parts. Also circulated were templates for comments on each part. Part I contained Chapters I-IV, and was an advanced draft<sup>1</sup>, while Part II contained chapter V-IX and was less well developed, with only an outline of chapters VII and VIII provided. Background documents were also available on the EGM website (see <http://unstats.un.org/unsd/envaccounting/irws/>). These documents were: a paper to UNCEEA titled “International Recommendations for Water Statistics: Process Leading to the Publication”; the System of Environmental-Economic Accounting for Water (SEEAW), and; the International Recommendations for Industrial Statistics.
3. The responses to the draft provided in the templates from comments that were received prior to the meeting were consolidated by UNSD and distributed to participants at the meeting. The responses were used to identify key issues and questions for discussion during the EGM. The key issues and questions were included in the presentations made at the EGM.
4. This document summarises the recommendations and conclusions of the EGM. It follows the order of the chapters of the IRWS and also uses the questions and issues presented and discussed at the EGM. This document also includes a list of action points relating to the EGM and the process of finalising the IRWS and in particular, the establishment of a “pseudo-electronic” discussion group to facilitate the discussions of issues.

## Summary of recommendations and conclusions

### *General comments on the International Recommendations for Water Statistics*

5. The group suggested making more extensive use of diagrams to illustrate the concepts in the IRWS. It was also suggested to make use of generalised examples to illustrate the concepts.

### *Is the organization of the publication clear?*

6. The group found the organization of the publication to be clear.

### *Should any specific aspect be addressed more specifically in IRWS?*

7. The group had several recommendations regarding what else should be addressed. Climate change was considered an important issue and should be mentioned in the introduction (Chapter 1) as well as in the chapter on indicators as an application of IRWS (Chapter 9). In this regard, it was also noted that the occurrence of floods and droughts is important (Note: there was a later a discussion in which it was suggested to remove data items on number of people affected by floods from the supplementary list).

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<sup>1</sup> The first draft Part I (Chapters I-IV) and Chapter IX Indicators had been reviewed by a reference group in July of 2008 with feedback received in August of 2008.

## CHAPTER I: BACKGROUND

### *Is the purpose of the IRWS clear?*

8. The group stressed that it is important to more clearly specify that in addition to statisticians and hydrologists, representatives from other disciplines and agencies of government are important audiences for this publication. In this regard additional text can be added to paragraph 1.31. It was agreed that it would be useful to mention in the introduction the importance of adequate monitoring networks or systems to provide the data. The decline of the physical monitoring infrastructure was noted as a key concern and could be mentioned in relation to the material covered in Part II. There is also a need to draw attention to the fact that in some cases estimates or lesser quality data (rather than direct observation or collection) may have to be used.

### *Is the scope of IRWS clear?*

9. The group found the scope to be clear. It was noted that while water quality is an important aspect of water management and that international standards for water quality are needed that water quality was out of scope of IRWS. The group requested that the issue of water quality be raised in the introduction and that the links to water quality should be made wherever possible in IRWS. For example, the text could explain the links of the emissions data items to water quality. It should also be made clearer in the scope that in-situ use of water (e.g. for transport) is not within the scope of this publication. In addition the need to clarify the definition of in-situ use was noted.

### *Is it important to have a standard definition of fresh water?*

10. The definition of freshwater was recognised as a key issue. However, because of the range of definitions used in countries and for different sectors (e.g. freshwater for agricultural purposes is defined differently from freshwater for drinking water), the group recognised that it would be difficult to develop a new definition for the purposes of IRWS. As such the group agreed to maintain the current definition, and that references to other definitions and a summary of these should be included in compilation guidelines. For this, countries will provide examples of their definitions for different uses (e.g. drinking water) and the salinity classes used.

### *Is the description of data items appropriate?*

11. The group agreed that the description of the data items was appropriate for the purposes of the introduction.

### *Other notes on Chapter I*

12. The group proposed to include some text on policy applications in Chapter 1.

13. The group said that the IRWS needs to make it clear in the chapter that the “human dimension” of water is important – i.e. water is more than a commodity.

14. The group agreed that a data quality assessment framework for water statistics should be developed as part of the compilation guidelines and should be mentioned in the future work section of Chapter I. It was noted that there was very little material on this subject related specifically to water.

15. The group agreed with the audience diagram from Chapter VIII and suggested that it could also be used in Chapter I to help explain the differences between statistics, accounts, indicators, etc.
16. The group suggested that some additional text could be added to the note on terminology. In particular, that the terms and concepts used in IRWS must be interpreted carefully, as the same word can often have different meanings in different data sources and indicator sets.
17. The group suggested that for the social-demographic aspects, it was important to refer to WHO-UNICEF Joint Monitoring Programme (JMP).
18. The group suggested that it is important to add environment/ecological flows, water rights and water trading to the areas for future work.
19. The group recommended that a paragraph on why data collection is important be added in Chapter I as well as some additional material on the importance of data for management. The quote offered was: “If it is not measured, it is not managed”.
20. The group recommended that the issue of data quality and metadata be raised more prominently in Chapter I. This is also related to the issue of the state of monitoring networks and the investments in other data collection/compilation.
21. The group recommended that a brief discussion on indicator should be placed in Chapter I. It was noted that indicators are a communication tool and that they are related to specific issues or policies.
22. It was also recommended that a reference to the compilation guidance be highlighted in Chapter I.

## **CHAPTER II: MAIN CONCEPTS AND FRAMEWORKS**

*Is the description of water in the environment appropriate for the purposes of IRWS?*

23. Water resources in the hydrological sense indicate both stocks and flows of water. The IRWS needs to be clearer about what is meant by water resources and review Figure IV.1.

*Do we need more details in the definition of inland water resources?*

24. The group said the definition is adequate. The diagram accurately represents the system of inland water resources and there is no need for additional detail.

*Is the description of the economy clear?*

25. The group agreed that the definition is complex but it was agreed to be adequate for the purposes of IRWS. The group asked UNSD to investigate the possibility of simplifying the definition based on the definitions used in other international standards or recommendations (e.g. the Balance of Payments Manual).

*Is the description of social-demographic statistics clear?*

26. The group agreed to expand the content to be more in line with the economic and environment sub-sections and in particular to include text regarding social-demographic statistical concepts (e.g. from the recommendations on the census of population and housing). A reference to the JMP (WHO-UNICEF) program should be included. Issues like equality of access are important but it was recognised that this will be difficult to cover in the IRWS. UNSD was asked to investigate this further.

27. The group noted that the data item regarding access to water need to be clarified to account for the periods in which water was not available. For example, because of malfunctioning infrastructure.

*Is the description of the SEEAW clear?*

28. It was agreed that the description of the SEEAW was clear. However, it was suggested to add some more detail regarding applications of the SEEAW. This could be included in an expanded Chapter IX.

*Is the description on spatial and temporal reference clear?*

29. It was agreed that the description of spatial and temporal references was clear. However the group suggested that some text on the boundaries of aquifers be added. It was also suggested to refer to the overlap between groundwater and surface water. FAO offered to provide references and draft some text on this. The IRWS needs to make it clear that national and yearly data will hide large spatial and temporal variation. Finer level spatial and temporal detail is, for example, needed for examining floods and droughts. It was also suggested to include reference to long term annual averages which are relevant for particular data items (e.g. precipitation).

### **CHAPTER III: STATISTICAL UNITS AND CLASSIFICATIONS**

*Is the definition of statistical units appropriate for the purposes of IRWS?*

30. The group agreed that the definition of statistical units is appropriate for the purposes of the IRWS.

*Do you agree with the definition of physical units of the environment (and should wetlands be added)?*

31. The group agreed that the “containers” of water and not the water itself are the statistical units of the environment. They include lakes, rivers, aquifers and glaciers. Where to include wetlands was raised as an issue and it was suggested that wetlands could be added as a statistical unit. UNSD was asked investigate definitions of wetlands (e.g. that used in RAMSAR). It was noted that each “container”/water body can only be included in one of the category of units (i.e. each unit cannot be classified as a lake and a river, it must either be either a river or a lake). The definition of lakes should specifically mention the inclusion of small lakes or lagoons.

32. Questions were raised within the group about the inclusion of artificial reservoirs as being units of the environment. The view expressed was that they should be considered as part of the economy. While the practice of including as part of the environment is in line with the SNA and the SEEAW the matter should be reviewed. It was proposed that the issue be brought before the London Group on Environmental Accounting, with Austria (Umweltbundesamt) and UNSD taking the lead in the drafting of an issue paper for discussion at the next London Group meeting in April 2009. The consequences of any proposed changes will need to be explored in detail. For example, if the artificial reservoirs are part of the economy, then the water in artificial reservoir will be an inventory, the abstraction of water will be a withdrawal from the inventory and precipitation would be capital formation.

33. Soil water is not a statistical unit of the environment. It should be clarified that the units are the “containers” of the water, not the water in the containers. See also the discussion on soil water in Chapter IV.

34. The group recommended that the text should mention that one physical characteristic of the aquifer is whether the aquifer is confined or unconfined.

*Should the large artificial reservoirs be separated from the small ones (e.g. large dams from farm dams)?*

35. The group recommended that the distinction between large artificial reservoirs and other artificial reservoirs should be mentioned in the text but there is no need to have a separate data item. This distinction is related to data collection and more guidance can be provided in the compilation guidelines.

*Do you agree with using the term “institutional unit” in the IRWS?*

36. The group did not find the use of term institutional unit to be intuitive and there was a preference for the use of the term economic units (as in an earlier draft). The group understood institutional units to refer to enterprises and not to establishments, which are the units of reference in the IRWS. The group requested UNSD to investigate further the differences between institutional units and economic units and to the units to which they refer (establishments or enterprises).

*Are the most important industries relevant to water statistics identified?*

37. The group agreed that the most important industries relevant to water statistics had been identified. The group also recommended that the IRWS should explain clearly that the term industry is used to indicate all industries, including agriculture and services, and is not restricted to manufacturing industries. Aquaculture could be added to the industries of secondary importance (i.e. with forestry and fishing, accommodation, etc.). The group recommended that all the industries that are not separately identified should be lumped together as “other industries” so that the totals are consistent. It was recognised that the classification of units with multiple activities (i.e. a range of secondary activities) could pose problems to those not familiar with national accounts. It was suggested to add some text on this in the chapter and that additional information be included in the compilation guidelines.

38. It was recommended that the electricity industry be explicitly divided into hydro-electric producers and other types of electricity producers.

39. The group also discussed some specific issues regarding industries and water statistics. This included the issue of different types of water use by different industries, i.e. some water is used in-situ or in-stream.

*Is it necessary to present the classification of establishments by institutional sectors?*

40. The group noted that it is useful to mention the classification of establishments by institutional sectors. The reasons for including it should be further elaborated in the text.

*Should characteristic 5 (of the statistical units) be changed to explicitly allow for multiple organisations management to be identified?*

41. Characteristic 5 (the organisation responsible for management) should be changed to allow for the identification of multiple organizations managing a particular water body.

*Is the order of the characteristics of inland water resources appropriate?*

42. It was proposed to re-order the characteristics so that the organisations responsible for management/collection of data would be first. The group suggested that while the organisations

responsible for management are important, it was felt that it was the inland water resources themselves that were the main focus and hence the identification code, location and name should be first.

*Are any important characteristics of inland water resources and institutional units missing?*

43. Standard physical characteristics should be developed for each of the units of the environment (e.g. river, lakes, wetlands, groundwater/aquifers, etc) and then tested in countries. This would include, for example size, as measured by length of rivers, flow of rivers, capacity of reservoirs, area covered by wetland etc. The group discussed the classification of rivers by stream order / hierarchical river system in which they belong. This could also be relevant to location. EU Water Framework Directive guidance documents may be able to provide some guidance on this. The group requested UNSD, with the help of Austria and Eurostat, to investigate.

*What are country practices in establishing a frame of inland water resources?*

44. Countries were encouraged to submit their practices to UNSD.

#### **CHAPTER IV: DATA ITEMS**

*Should each data item make reference to the need for spatial and industry disaggregation?*

45. The group recommended that the reference regarding the need for spatial and industry disaggregation be made only once. However, particular data items should highlight the industries of most relevance to the data items. Also any exceptions to the need for spatial and industry disaggregation should be clearly identified.

*Should more on the units of measurement be included (e.g. m<sup>3</sup>)?*

46. The group recommended that more on the units of measurement should be included. It was suggested to include a page on units of measurement in an appropriate place in the IRWS. It was also decided that the IRWS should recommend standard scientific units be used for data presentation, although it was noted that countries may collect data using units in common usage (e.g. data collected may be collected in gallons but should be presented in m<sup>3</sup>). It was also suggested that a conversion table be included, possibly as an annex. More details on the units and country practices should be included in the compilation guidelines. The group recommended that the issue of rounding and rounding errors should be mentioned.

*Can the list of data items be shortened or can the items be prioritized?*

47. The group recognized that the current list of data items has a hierarchical structural integrity and uses a system's approach. These features are important and should be preserved. It also was recognized that countries may need to prioritize the data items and that this could be done in a number of ways

48. The group noted that it would be useful to add some text for the different data items identifying the most relevant industries. It was also recognised that countries will identify their own priorities, and that this would not necessarily lead to the development of comparable country data. As such the prioritization of the data items should be addressed and possibly a minimum data set should be identified. This could probably be done more appropriately at the regional or sub-regional level rather than globally. As an example, the OECD/Eurostat and UNSD/UNEP questionnaires already include flags to identify high priority data items.

*Is the definition of renewable and non-renewable groundwater (Data items A.2.1 and A.2.2 and E.1.2.1 and E.1.2.2) appropriate?*

49. The group noted that the concept of “renewable” and “non-renewable” applies not only to aquifers but also to lakes (e.g. the Great Lakes of North America). Although the definition of renewable/non-renewable at presented is probably acceptable, there was an issue with the terminology. It was agreed that UNSD will set up a “pseudo electronic discussion group” to discuss this issue (and others). It was suggested to include a diagram of what is renewable or non-renewable to assist the discussion. The group also determined that confined and un-confined could be included as part of the characteristics of the statistical unit “groundwater” in Chapter III. It should be explicitly mentioned that a confined aquifer does not necessary mean that it is non-renewable, and the example of renewable groundwater in confined aquifers mentioned by UNSD could be referenced in the IRWS.

*Should wetlands be added to the list of water resources under Data item A?*

50. It was recommended by the group that wetlands be included. See discussion in Chapter III.

*Is the level of detail in Data item E (Abstraction) necessary?*

51. The group recommended that the IRWS needs to clearly state that abstraction includes abstraction for hydro-electricity. The text should note that abstraction in other contexts may not include abstraction for hydro-electricity.

52. The group agreed that abstraction from other sources should be eliminated and abstraction from precipitation and abstraction from the sea should be elevated to a higher level (for example coded E.3 and E.4 directly). The group also recommended that IRWS states explicitly where to include urban run-off.

*Can the definition of wastewater be clarified?*

53. The group agreed that the definitions and terminology regarding wastewater and other related terms, needs to be clarified. At present wastewater is defined in the IRWS according to the definition of SEEAW, which is water of no further use for the purpose for which it was intended. Similar definitions are used by OECD/Eurostat and FAO. Wastewater in other contexts, and in particular in the field of wastewater treatment and management, refers to the water which contains waste or pollution. The group recommended that UNSD, in association with Austria (Umweltbundesamt), Mexico (CONAGUA) and Eurostat, clarify the text.

*Should the supply of treated or untreated wastewater (or re-use water in SEEAW) be shown in an elaboration of data items G and F?*

54. The group agreed that the supply of treated and untreated wastewater should be shown in an elaboration of data items G and F. It was also suggested that the water discharged can also be disaggregated by the non-polluted water discharged without treatment and the polluted water discharged without treatment.

*Which presentation of data items for flows within the domestic economy is preferred?*

55. The group decided to use presentation F-I.

*Should the presentation of data items for imports and exports be consistent with the presentation of flows within the economy?*

56. The presentation of the data items for imports and exports should be consistent with the presentation of flows within the domestic economy. As such the group adopted the presentation of imports and exports consistent with F-I.

*Should the physical supply and use of bottled water be included in the list of physical data items?*

57. The physical supply and use of bottled water should be included in the list of supplementary data items.

*How much detail needs to be shown in the losses for distribution?*

58. The group recommended that the level of detail be reduced, but stated it was important to ensure that the components are identified in the text. The detailed list of data items should be presented in the supplementary data items.

*Is the proposed level of sub-division needed for waterborne emissions to the environment (Data item 0)?*

59. The group agreed that this level of sub-division is needed for waterborne emissions to the environment.

*Should the value of bottled water be included?*

60. The value of bottled water should be included in the supplementary data items and should be presented in a way that is consistent with the physical information.

*Should the costs for water supply and sewerage be further elaborated?*

61. The group agreed that the costs for water supply and sewerage should be consistent with national accounts concepts, and specifically include data items for fixed capital formation, consumption of fixed capital, wages and salaries, other running costs, with electricity noted as one of the running costs of particular concern. It was recognized that some re-ordering of this group of data items may be necessary. UNSD will follow up with national accountants working on water accounts.

*Should economic losses in the form of "lost revenue" be included?*

62. The group considered economic losses in the form of lost revenue to be policy relevant and recommended that it be included in the supplementary data items. It was also noted that this is a calculated item, i.e. the difference between invoices and receipts for the water and sewerage services.

*Should ecological flows be added to the list of data items? If so what are the countries practices for defining these?*

63. The group did not discuss this in the session. The group is invited to submit comments via email. However the issue was touched upon in previous sessions and it was suggested to add this to the areas for future work in Chapter I.

*Should water rights be added to the list of data items? If so what are the countries practices for defining these?*

64. The group did not discuss this in the session, and instead the group was invited to submit comments via email. It was, however, suggested to add this to the areas for future work in Chapter I.

*Should we add in the number of connections to the distribution network that have a meter?*

65. The group did not discuss this in the session, and instead the group was invited to submit comments via email. The group did note that this was already in the supplementary data items, and it was suggested to be added to areas for future work in Chapter I.

*Additional question on stock of soil water (Data item A.3)*

66. The group discussed the concept of soil water and soil water stocks at some length. Two main views emerged, although there were different reasons underlying the support for each view. The views were:

1) Soil water is an important concept and should be included in the stocks of water, although its measurement is difficult. It is an important variable needed for the calculation of evapotranspiration and use of soil water (or green water) by agriculture and forestry, both of which are commonly requested data items. It was recognised that the data item supported a systems (or stocks and flows) approach and also that while the data item is not currently collected by international agencies, it was being calculated by some countries because it was useful for their purposes and it is included in the SEEAW (Canada, Mexico, UNSD).

(2) Soil water should not be included in stocks of water: due to the extreme temporal and spatial heterogeneity of soil water content, the data are not reasonably interpretable on the scales of national territories/years and hence are not suitable as object of water statistics. Soil water is of transitory nature, and its total stocks are very small as compared to surface- and groundwater (Eurostat, FAO)

67. The group agreed to establish a sub-group consisting of FAO, Eurostat, UNSD, Statistics Canada and CONAGUA (Mexico) that would address this issue. As a first step UNSD would draft a paper outlining the issue.

*Other notes on Chapter IV*

68. The group suggested that it would be useful to show under the alternative presentation of Data item L.b the polluted water discharged and the non-polluted water discharged without treatment (at least in the text). This is related to distinguishing the water used for hydro-electricity generation and cooling water which is used but does pollute the water (except for heat) and it was noted that this could be at least be partly shown using the disaggregation of this data item by industry. The group also recommended that the alternative presentation of data item L should be used for data item O.

*Supplementary data items*

69. The group suggested adding the capacities of wastewater treatment plants to the main list of data items. This would need to be included as a separate table, under the physical data items.

## CHAPTER V: DATA COLLECTION STRATEGY

*Should Chapter V be merged with Chapter VI (Data sources and methods)?*

70. The group recommended that the chapters remain separate, and not be merged, as they deal with different but related issues.

71. The group suggested the addition of a paragraph explaining that Chapter IV describes “what” should be collected, while Chapter V begins to address the “how” data can be collected.

*Should the data collection strategy come before or after data sources and methods?*

72. It was recommended that the data collection strategy should be first because it presents the general situation (or “big picture”). The strategy also has a broader audience as one of its key aims is to present a process to bring data producers and users together.

*Should the section on business registers be in Chapter V or Chapter VI (currently in Chapter VI)?*

73. The group recommended that the section should remain in Chapter VI.

*Are the purposes of the data collection strategy clear? Can the number of purposes be reduced? Should any other purposes be added?*

74. The group identified three additional purposes:

- Improve the accessibility of data for decision makers
- Facilitate collaboration between data producers and data users (i.e. all stakeholders in water statistics). This includes the development of networks or “communities of practice”.
- Facilitate collaboration and coordination within agencies

75. The group discussed the importance of involving policy makers in the development process. This should be reflected in the text outlining the purposes of the chapter.

*Should paragraphs 5.6 – 5.9 on the institutional frameworks be moved to Section B and replaced with a few sentences in Section A?*

76. The group agreed that paragraphs 5.6-5.9 on the institutional frameworks should be moved to Section B and replaced with a few sentences in Section A. The group noted that institutional frameworks are very important and need to be introduced in Section A, while most of the material should be in Section B. Chapter I should also briefly introduce material on the importance of institutional frameworks (in many instances there are many agencies involved in water who are uncoordinated with little harmonisation of activity).

*Is the process of developing a data collection strategy clear? Are all the main steps of developing a data collection strategy shown? Should the diagram of the overview of the data collection strategy be simplified or expanded? Should each of the boxes be elaborated more fully in the text?*

*Note: These questions were discussed together. The main points made were the following:*

77. The group noted that the process figure is comprehensive but recommended it should be simplified to have fewer boxes and each box should be explained in more detail in the text. A clear entry point should be shown in the diagram and it was suggested to show a linear process for the first 3 steps of the current diagram and then show a cycle. The IRWS needs to include

text on the importance of high level involvement in understanding and improving the institutional set-up. The IRWS also needs to make it clear that this is not a detailed “recipe” but a range of issues that need to be considered.

*Have all the main stakeholders been identified?*

78. The group agreed that all the main stakeholders had be identified but recommended that the hydrological and meteorological agencies be separately identified. The group recommended that the start of paragraph 5.12 be reworded to: “the production and use of water statistics includes, but is not limited to, the following: . . .” It was also recommended that the IRWS use ministries of government instead of the current list of ministries (e.g. Ministries of government responsible for agriculture, water, natural resources, etc...).

*Do the main stakeholders need to be described in the text?*

79. The group decided that not every stakeholder needs to be described in detail, but some general indication of the responsibilities of the main stakeholders would be useful.

*Is more information on institutional frameworks needed?*

80. The group agreed that more information on institutional frameworks is needed and that this section should be elaborated to include, for example, more details on:

- Legal and administrative frameworks
- The typical roles and responsibilities of different stakeholders, with some explanations of the differences in the agencies responsible at the various levels of government (e.g. national, state/provincial and local)
- The water supply and sewerage service providers (government and non-government)
- Coordination mechanisms

*Is it possible or useful to present a “typical” institutional framework?*

81. The group recommended that country examples be collected for the compilation guidelines. If possible, a stylised example could be drawn from this and used in Chapter V. It was noted that the example should not be prescriptive (i.e. the example is not the only or best way to organise institutions).

*Is the section on data sharing adequate? If not what should be added and how much detail is needed?*

82. The section can be elaborated. In particular it should:

- Be clearer on the goals of data sharing from both the producer and user perspectives. In particular the advantages of data producers sharing data need to listed (e.g. reducing costs of production, reducing provider burden).
- Include discussion on the importance of the metadata and highlight the need for designated contact points within agencies.
- Mention that the users of data should acknowledge the source of data in publications or policy analysis.
- Recognise that some data providers are reluctant to share data. FAO offered to share some experiences and assist with the development of text on this.

*Is the section on prioritising data items clear?*

83. The group agreed that the section on prioritizing data items was clear and provides a comprehensive list of the issues which need to be considered. The compilation guidelines should include country examples of prioritisation. The group recognise that prioritisation can, and should be done by regions (e.g. ECLAC, ESCWA) or country groups.

*Is a detailed section on implementation plans needed? If so, what information should be in an implementation plan?*

84. The group did not think a detailed section on implementation plans was needed and recommended that this section be removed and replaced with a paragraph or two. The table could be included in the compilation guidelines.

*Other notes on Chapter V*

85. In the discussion of Chapter V, it was suggested to change the title of the Chapter V, but it was explained that the titles come from the family of UNSD statistical publications know as “statistical standards”, and hence this would be difficult. As such it was agreed to leave it as it was. However, the current structure and sub-heading of the chapter will need to be reviewed after the suggested changes to the chapter are implemented.

86. The group recognised that while the IRWS was mainly aimed at technical people (data producers) it needed to engage data users and hence needed to use as simple language as possible. The group were invited to submit additional comments on this chapter after the meeting.

## **CHAPTER VI: DATA SOURCES AND METHODS**

*General comments*

87. The group noted that there is a need to link the information in Chapter VI with the specific information of the compilation guidelines. In relation to the compilation guidelines it was suggested that for each data item a data sources and methods sheet could be prepared. This approach is like that of the World Water Development Report which also produces method sheets.

*Is the introduction suitable?*

88. The group agreed that the introduction is suitable, but suggested to mention the need for geographic information to be included in databases.

*Is the terminology clear? Is it necessary?*

89. The group agreed that the terminology was clear, and noted that it is good to keep definitions in the text for those unfamiliar with data sources and methods. It was emphasised that the terminology needs to be consistent with the glossary that is to be developed. The group recognised that the terminology is evolving and as a consequence of this, how to keep references up-to-date will need to be considered (e.g. SDMX is evolving and the web address on the new version is different from the old version). The group agreed that in general the terminology should be accessible to a wide audience. The group noted that the IRWS needs to be clear about what is meant by measured, estimated, calculated, etc. It was asked if there are standard definitions of these terms and can they be added to the section on terminology and to the glossary.

*Is the outline clear? Is there a need for a more detailed outline?*

90. The group found the outline to be clear, but it was suggested that it may be better to have the section on administrative data sources before the information on surveys. There was some discussion about the relative merits of the order and it was decided that there was at present no major reason to prefer one order over another. As such the current order should be retained but countries and international organisations were invited to provide additional comments on the issue after the EGM.

*Is the description of the need for and purpose of survey frames clear?*

91. The group agreed that the purpose was clear.

*Is the reference to other recommendations enough, or should they be summarized here?*

92. It was agreed that references and footnotes are useful but ideally a brief summary should be included for the main references. The group felt that this is a question of balancing the need to keep the material accessible to wide audience, with a need to provide data producers with enough information so that they know how to collect or compile the information. It was agreed that most of the detail should be included in the compilation guidelines.

*Are the different types of data sources clear? Are there any other major data sources that should be mentioned?*

93. The group agreed that the sources are clear and no other major data sources were identified.

*Is the description of surveys and the different types of surveys that can be used, clear?*

94. The group agreed that the descriptions were clear but there was a need to add in the information on the different types of surveys (mail-out/mail-back, telephone interview, personnel interview, electronic data reporting, etc). Statistics Canada offered to share some material on its Integrated Metadata Database (IMDB).

*Are the main advantages and disadvantages of surveys fairly explained? What else could be added?*

95. The group recommended that the list of advantages and disadvantages for all data sources should use the same format (i.e. bullets points). It was recommended to add to the list of disadvantages for surveys, the acceptance of additional data items by stakeholders. This is also relevant to administrative data sources.

*Have all the data items collected by surveys been identified?*

96. Participants were invited to send comments on this question after the EGM.

*Is the description of administrative data clear?*

97. The group agreed that the description of administrative data was clear.

*Are the main advantages and disadvantages of administrative data sources fairly explained? What else could be added?*

98. The group indicated that there was a need to be more balanced, and use a neutral tone in the description of the advantages and disadvantages of data sources.

99. The group made some specific recommendations for changes to the text. The issue of bias due to different scope and coverage was discussed. This point is covered in the paragraph 6.59 and in the last dot point of paragraph 6.60 but this text should be expanded, with a hypothetical example. Paragraph 6.74 needs to highlight the fact that some of the data collected by industry associations is collected in part for political purposes so some care needs to be taken when using these data. Austria offered an example of this. Also, in paragraph 6.74, these organisations will often be a source of water use coefficients.

*Have the main agencies that are likely to have administrative data been identified?*

100. The group agreed that the main agencies that are likely to have administrative data were identified.

*Have all the data items that could be collected from administrative sources been identified?*

101. The group recommended that in paragraph 6.77, stream-flow should replace run-off because stream-flow is measured, while run-off is calculated.

*Is the description of hydrological and meteorological data clear?*

102. The group had no comments on the clarity of the description of hydrological and meteorological data.

*Are the advantages and disadvantages of hydrological and meteorological data explained? What else could be added?*

103. The group had no comments on the advantages and disadvantages of hydrological and meteorological data.

*Have all the data items that could be collected from hydrological/meteorological sources been identified?*

104. The group agreed that all the data items that could be collected from hydrological and meteorological sources had been identified.

*Is the description of research data clear?*

105. The group recommended adding a reference to the compilation guidelines, or other references, on how to scale-up data from case studies to paragraph 6.94.

*Are the advantages and disadvantages of research data fairly explained? What else could be added?*

106. The group agreed that the advantages and disadvantages of research data are fairly explained but added that there is a need to add to paragraph 6.87 that researchers may have coefficients of water use by crops for both rain-fed and irrigated agriculture.

*Have all the data items that research agencies could be expected to produce been identified?*

107. The group agreed that the data items that research agencies could be expected to produce had been identified.

*Is a section on compilation methods needed? If yes, is the description of compilation methods clear? Should more or less detail be included? Should it be kept at the general level or be specific to water statistics?*

108. The group agreed that while some general information was useful, what is needed by countries are specific examples and country practices. It was agreed that most of the detail should be in the compilation guidelines and that the text in this chapter should refer to other material rather than repeat detailed information included in other publications. For example, it was suggested that the detailed information on imputation could be removed and replaced with a reference.

#### *Other notes on Chapter VI*

109. The group had some other recommendations for the text. In paragraph 6.18 there is a need to strengthen the text on the linking of codes for the same unit from different data sources (i.e. say ideally they should use the same codes). In paragraph 6.64 it is important to note that these effects can vary and it would be useful to have some examples at least in the compilations guidelines. In paragraph 6.71 replace “most” with “many” in first sentence and in the second replace “will often” with “may” and delete the words “significant amounts”.

110. Participants were invited to submit additional comments on Chapter VI after the meeting.

### **CHAPTER VII: DATA QUALITY AND METADATA**

#### *General comments*

111. The group recommended that the issue of data quality and metadata needs to be raised more prominently in Chapter I, as this is related to the issue of the state of monitoring networks and the investments in other data collection/compilation.

*Should there be standard metadata for water statistics? If so, what should it be and which of the metadata frameworks is the most appropriate starting point for water statistics?*

112. The group agreed that there should be standard metadata for water statistics. Eurostat offered to share material on the metadata guidelines that they have helped develop and suggested this could be used. Statistics Canada also suggested looking at their Integrated Metadata Database (IMDB) which is their database in which the methodology of surveys is recorded.

*Which data quality framework is most appropriate starting point for water statistics?*

113. The group agreed the IRIS chapter on data quality is good starting point for this chapter in the IRWS.

*Should we develop a data quality assessment framework as part of the IRWS or should this be part of the compilation guidelines?*

114. The group agreed that a data quality assessment framework for water statistics is needed and that it should be developed as part of the compilation guidelines.

#### *Other notes on Chapter VII*

115. Following the discussion, participants were invited to submit additional comments on Chapter VII after the meeting.

### **CHAPTER VIII: DATA DISSEMINATION**

#### *General comments*

116. The group agreed that the IRWS needs to encourage dissemination in innovative forms that go beyond tables. For example, it should cover maps and interactive presentation tools on

the internet. References to magnetic tapes and audiocassettes are outdated and should be removed.

*Is there sufficient detail in each of the sections or does more detail need to be included?*

117. The IRWS needs to make it clearer why the presentation of data is important and needs to include more detail on GIS.

*Are there any other aspects of data dissemination that should be covered?*

118. The group had several additional recommendations. The group agreed that the IRWS needs to cover web based and interactive dissemination of information. The IRWS also needs to address the issue of data storage and documents on databases (this is an issue of knowledge management and it is probably relevant elsewhere in the IRWS). It was mentioned that the frequency of publications is an important consideration also from the perspective of resources (staff, etc). Annual publications mean the cycle is better understood and more easily resourced than less frequent publications. The group also agreed that regular or annual publications help to keep data and data issues at the forefront of data users thinking.

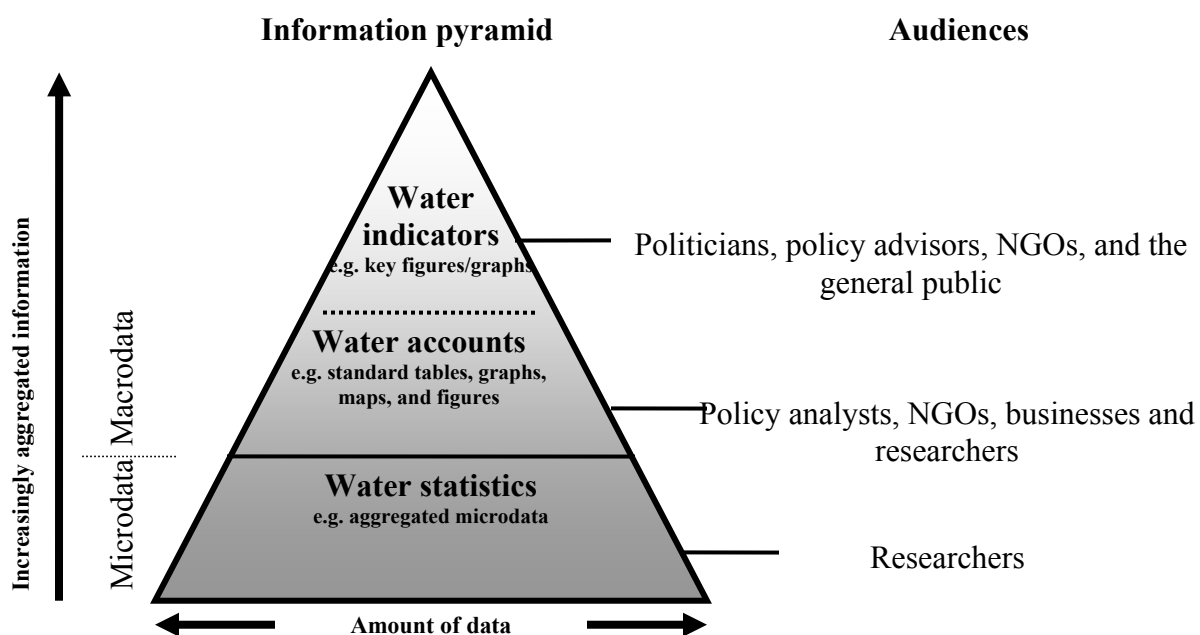
*Is the introduction suitable?*

119. The group had no comments on the introduction to Chapter VIII.

*Is the diagram an accurate reflection of audiences for water statistics?*

120. The group agreed that the diagram (shown below) is an accurate reflection of audience for water statistics. The diagram is useful and it was suggested that it could also be used in earlier chapters, including Chapter I to help explain the differences between statistics, accounts, indicators or in the indicators chapter (Chapter IX).

**Figure 1: Information pyramid and audiences.**



*Are these three principles sufficient or should other principles be included?*

121. It was agreed that these three principles for data dissemination are sufficient.

*Have any details (relating to publication of water statistics) been missed?*

122. The group had no comments on whether any details had been missed.

*Does more information on revisions to data need to be included or is this sufficient?*

123. The group had no comments on whether more information on revisions to data needed to be included.

*Did you find the section on international reporting of data useful? Was the level of detail sufficient?*

124. The group recommended that the links between the international questionnaires to the data items should be addressed in detail in the compilation guidelines.

*Other notes on Chapter VIII*

125. Following the discussion, participants were invited to submit additional comments on Chapter VIII after the meeting.

## **CHAPTER IX: INDICATORS**

*Is the introduction to this chapter suitable?*

126. The group mentioned the need to explain in the introduction that the terms and concepts used in different indicator sets must be interpreted carefully, as the same word can have different meanings in different indicators (e.g. use and consumption). There is also a need to explain why the IRWS is useful for producing indicators and how indicators relate to the data items and SEEAW.

*Is the structure of this chapter appropriate? In particular, do you agree that having the detailed links to the WWDR, MDGs and the FAO included in annexes? Should these be merged with Chapter 9?*

127. The group agreed with the structure. It was suggested that Section B could be strengthened and that it would be useful to include the details and the links of the data items to the international indicators in the annexes. UNSD will need to work with international organisations and countries when developing these. Links to other indicators or international data collections could be added at a later stage or included in the compilation guidelines.

*Have the main uses of indicators been identified?*

128. The group agreed that the main uses of indicators have been identified.

*Should the statement about what an indicator is (data item etc) go to the introduction?*

129. The group recommended that the statement about what an indicator is should go into the introduction of the IRWS. Indicators are a communication tool and they are related to specific issues or policies.

*Have the main criteria/characteristics for indicator selection been identified?*

130. The group agreed that the main criteria/characteristics for indicator selection had been identified and the use of the OECD criteria was appropriate.

*Have all main indicator types been identified?*

131. The group had no specific comments on whether all main indicator types had been identified.

*Are the descriptions of main indicator types clear?*

132. The group agreed that the descriptions of the main types of indicators had to be clear, but the selection of the examples of indicators needs to be done very carefully. It was also recommended that the text in the chapter should be general, with the detail in the annexes and specific examples included in the compilation guidelines.

*Other notes on Chapter IX*

133. The group's discussion on indicators was broad ranging. The group discussed the need to explain that indicators change over time. The example of the indicators for the WWDR was provided (in 2003 there were 150, in 2006 there were 60 and in 2009 there will be 60, but they are not identical to those used in 2006). As policy focus shifts so does that of indicators and the link between policy and indicators needs to be elaborated. The group mentioned the need to be clear that national statistical offices do not usually determine what the indicators should (i.e. they do not primarily address the question of what indicators should be used but how the data to support the indicators is compiled).

134. It should be clearly stated that indicators are primarily a communication tool and the information pyramid was useful for showing this. Indicators are needed for comparisons over time as well as between countries or areas, but there is a need to include text on the limitations of indicators. The text should mention what is a useful indicator for one country, may not be a useful indicator for another country, and that national level indicators often hide significant variation within countries.

135. It was suggested that the chapter should be expanded to cover policy use of water statistics and accounts in general. It was agreed that more on policy use could be included in this chapter as well as in Chapter I, and should also be a part of compilation guidelines.

## **ANNEXES AND COMPILATION GUIDELINES**

*General comments*

136. The group recommended that the guidelines include links to international questionnaires, and information on institutional frameworks. It was noted that the IRIS has a prototype which could be investigated.

137. It was also recommended that a reference to the compilation guidance be highlighted in Chapter I.

138. The material for the compilation guidelines should be developed with IRWS (i.e. they are developed in parallel, even though they may not be completed at the same time as IRWS).

139. UNSD advised the group that the compilation guidance will probably be included in a 'knowledgebase' and build on existing UNSD platforms (e.g. the knowledgebase used for industrial statistics and SEEAW Searchable Archive).

## *Annexes*

140. The group noted that the supplementary data items regarding soil water and wastewater will need to be updated to account for any changes made in Chapter IV.

141. The group asked UNSD to investigate water quality and determine if any standard water quality data items that can be included in the supplementary data items. The group recommended that a working group be established to investigate water quality statistics data items, concepts, methods and sources that could be included in the compilation guidance or in future updates of the IRWS. No agency volunteered to lead this.

142. A number of changes were recommended by the group for the list of supplementary data items. The group recommended that the supplementary data items include sewage sludge, and that the definition be based on the data items used in the OECD/Eurostat Joint Questionnaire on Water.

143. Regarding supplementary data items SD.9 to SD.10.3 the group recommended that wastewater collection and treatment capacity should be included as additional data items for the organic design capacity in addition to the capacity in terms of volume.

144. The OECD/Eurostat Questionnaire has supplementary data items SD.35.1.1 to SD.35.1.2 (population with wastewater collected by institutional units) broken down by treatment levels this should be mentioned in the definition of these data items.

145. The group recommended that the number of people killed or affected by flooding to be deleted.

## Annex I: Action items

Action items	Country/ Organisation	Indicative timetable
<b>Part I</b>		
<i>Chapter I</i>		
Update chapter based on EGM discussions and as the content of Part II develops.	UNSD	On-going
Definition of freshwater: Countries to provide information on the definitions of freshwater for inclusion in the compilation guidelines.	UNSD / Countries	January 2009
Water quality		
<i>Chapter II</i>		
Update chapter based on EGM discussions.	UNSD	January 2009
Provide references and draft text on the overlap between surface and groundwater.	FAO	January 2009
<i>Chapter III</i>		
Update chapter based on EGM discussions.	UNSD	January 2009
Investigate further the differences between institutional units and economic units	UNSD	January 2009
Investigate definitions of wetlands	UNSD	January 2009
Develop standard physical characteristics for the inland water resources (with reference to EU Water Framework Directive).	Austria, Eurostat and UNSD	January 2009
<i>Chapter IV</i>		
Update chapter based on EGM discussions.	UNSD	January 2009
Draft a paper outlining the issues related to wastewater	UNSD	January 2009
Clarify the definition and terminology used related to wastewater.	Austria, Mexico, Eurostat, and UNSD	January/ February 2009
Clarify the definition and terminology used related to renewable/non-renewable	UNSD and FAO	January/ February 2009
Draft a paper outlining the issues related to soil water	UNSD	January 2009
Clarify the definition of soil water and how this is related to the data items proposed for the IRWS	Mexico, Canada, Eurostat, FAO, and UNSD	January/ February 2009
<b>Part II</b>		
<i>Chapter V</i>		
Update chapter based on EGM discussions.	UNSD	February 2009
Develop text to highlight the issue that some data providers are reluctant to share data.	FAO / UNSD	January 2009
<i>Chapter VI</i>		
Update chapter based on EGM discussions.	UNSD	February 2009
<i>Chapter VII</i>		
Develop chapter based on the material in IRIS and EGM discussions	UNSD	2 <sup>nd</sup> quarter 2009
Provide information on metadata and data quality standards to UNSD	Canada, Eurostat, Countries	
<i>Chapter VIII</i>		
Develop chapter based on the material in IRIS and EGM discussions	UNSD	2 <sup>nd</sup> quarter 2009
<i>Chapter IX</i>		
Update and expand chapter based on EGM discussions	UNSD	March 2009
<i>Annexes and glossary I</i>		

Action items	Country/ Organisation	Indicative timetable
Update and expand annexes based on EGM discussions	UNSD	2 <sup>nd</sup> quarter 2009
Compile glossary		2 <sup>nd</sup> quarter 2009
<b>Compilation Guidance</b>		
Continue adding material to the searchable archive and developing a knowledgebase for storing information regarding the compilation of water statistics and accounts	UNSD	On-going
Countries and international organisations to provide case studies and other material to fill the knowledgebase.	Countries / International Organisations	On-going
<b>Other</b>		
Establish "pseudo-electronic discussion group"	UNSD	January 2009
Bring the issue of artificial reservoirs being included as part of the environment to the attention of the London Group and develop a paper to present an alternative.	Austria / UNSD	March 2009
Water quality. It was recognised that there was a need to develop recommendations on water quality but that this would not be possible for the IRWS at this stage. It was proposed to establish a working group on this subject but no agency offered to take the lead.		

**Annex II:  
Expert Group Meeting on International Recommendations for Water  
Statistics: Organisation of work**

**Tuesday, 4 November 2008**

*Registration of participants (9:30-10:00)*

*Morning Session (10:00 – 1:00), Chair: Mr. Michael Nagy, Austria*

1. Opening of the meeting
  - a. Opening statement
  - b. Objectives of the meeting
2. Introduction and process of development and adoption
3. Background (Chapter I)
  - a. Presentation summarizing the purpose, scope, audience, as well as the relationship between the IRWS and other water statistics related work
  - b. Discussion
4. Main concepts and frameworks (Chapter II)
  - a. Presentation summarizing feedback on the concepts of environment, economy, as well as spatial and temporal references, and the SEEAW framework of stocks and flows.
  - b. Discussion

*Afternoon Session (2:30 – 6:00), Chair: Mr. François Soulard, Canada*

5. Statistical units and classifications used in water statistics (Chapter III)
  - a. Presentation summarizing feedback on statistical units, characteristics of statistical units, establishments, and classifications used in water statistics.
  - b. Discussion

**Wednesday, 5 November 2008**

*Morning Session (9:30 – 1:00), Chair: Ms. Olga Luciano Lopez, Dominican Republic*

6. Data items (Chapter IV)
  - a. Presentation
  - b. Discussion
7. Annex 1 Supplementary data items
  - a. Presentation
  - b. Discussion

*Afternoon Session (2:30 – 6:00), Chair: Mr. Ricardo Martinez, Mexico*

8. Data collection strategy (Chapter V)
  - a. Presentation
  - b. Discussion
9. Data sources, frames and methods (Chapter VI)
  - a. Presentation
  - b. Discussion

**Thursday, 6 November 2008**

*Morning Session (9:30 – 1:00) Chair: Mr. Ricardo Martinez, Mexico*

10. Data Quality and Metadata (Chapter VII)
  - a. Presentation
  - b. Discussion
11. Data dissemination (Chapter VIII)
  - a. Presentation
  - b. Discussion
12. Water indicators (Chapter IX)
  - a. Presentation
  - b. Discussion

*Afternoon Session (2:30 – 6:00) Chair, Mr. Michael Nagy, Austria*

13. Glossary, Annexes, indexes and references
  - a. Glossary
  - b. Annex 2 - Links to SEEAW standard tables
  - c. Annex 3 - Links to Indicators  
(Note Annex 1 discussed after chapter IV)
14. Future work
15. Conclusions with action points on the development and adoption International Recommendations for Water Statistics

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