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COORDINATING WORKING PARTY ON FISHERY STATISTICS

Intersessional Meetings of Aquaculture and Fisheries Subject Groups

Eight Meeting of the Aquaculture Subject Group (AS)

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Report of activities on review of the Aquaculture Section of the CWP Handbook

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Document Summary

This document provides the progress report of the work carried out by the ad-hoc Task Group to develop the aquaculture section of the CWP Handbook. It covers the period March 2021- June 2022 and includes the rationale for the creation of the Task Group and some background information on previous work carried out on the aquaculture section of the Handbook. It also illustrates the activities carried out by the Task Group during the intersessional period, including the consultation process to revise the previous version of the section. The document provides as well the revised structure of the final draft Handbook and the envisaged next steps post CWP 27th Meeting.

CWP members are kindly invited to provide feedback on the work carried out including next steps, and on the final draft of the Handbook for its endorsement.

1. BACKGROUND

In 2008 the Coordinating Working Party On Fishery Statistics (CWP) agreed to expand its initial mandate to analyse in more detail the needs of the aquaculture sector, and a specialized group on aquaculture (CWP Aquaculture Subject Group: CWP-AS) was established by CWP-23 in 2010. Despite the small number of CWP parties involved in aquaculture statistics, CWP-AS has made good progress in developing standard questionnaires, revising the International Standard Statistical Classification for Aquatic Animals and Plants (ISSCAAP) and updating the international aquaculture farming systems classification in order to better serve the needs of aquaculture statistics.

CWP-AS has also drafted an aquaculture section for the CWP Handbook which was initially presented at CWP-24 in 2013 and later revised and considered during the CWP intersessional meeting in 2017. The main aim of the Aquaculture Handbook is to provide principles valid at international level relevant to aquaculture as well as to cover a range of basic global concepts, definitions, standard classifications, and corresponding codes, as applied to aquaculture data collection and statistics globally and by international agencies.

In 2019, CWP-26 established an ad-hoc task group (TG) to develop the aquaculture section of the



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Handbook including farming systems classification (referred herein as TG-Aquaculture) during the 2019-2022 intersessional period. At the same time the CWP-AS outlined a workplan to continue the work on the aquaculture section of the CWP Handbook, covering several topics.

The work of the TG-Aquaculture is based on the document drafted by CWP-AS in 2013, and presented at CWP-24. Indications on how to further improve the draft were given by CWP-24 and by the CWP intersessional meeting in 2017. In addition, further guidance on concepts, topics and structure was stemmed by CWP-26 in 2019. However, due to changes in the composition of the CWP-AS, no major work was carried out on the Handbook during the last few years and the latest version of the Handbook is still the one produced in 2013. Therefore, there was the need to not only update some of the sections, but also to carry out a thorough revision.

During the intersessional period 2019-2021 the latest draft of the Handbook has been revised, enriched and amended in its entirety and a global consultation started for its finalization and validation. The first preliminary revised draft was presented at the CWP Intersessional meeting on 2–5 November 2021. Subsequently other activities were implemented according to the Terms of Reference of the TG-Aquaculture and to the workplan agreed at the Intersessional meeting.

The resulting final draft of the Aquaculture Section of the CWP Handbook is presented for final review and submission to the session for endorsement, and the whole process since CWP-26 is hereunder summarized.

2. MAJOR ACTIVITIES UNDERTAKEN

2.1 Terms of Reference of the TG-Aquaculture

In March 2021 and in cooperation with the focal points of lead Parties, the CWP Secretariat started to develop the draft Terms of Reference (ToRs) of the five ad-hoc Task Groups established at CWP-26, which define the CWP areas of work during the intersessional period. One ToRs was for the “ad-hoc TG Aquaculture on the revision of the aquaculture section of the Handbook including farming systems classification” which provide an overall background, state the objectives, tasks and timeframe, and outline the organization of the work. The draft ToRs were shared for feedback and further amendments and were finalized in May 2021 (Information Document CWP-IS/2022/Inf.5). For ease of reference, Table 1 reports the tasks and timeframe for the work of TG-aquaculture that, inter alia, foresee a critical review of the draft aquaculture components of the Handbook and develop a revised structure.

Concurrently the CWP Secretariat confirmed the Coordinator of the CWP-AS and convener of the ad-hoc task group TG-Aquaculture, and hired two international consultants to support the activities towards the development and revision of the aquaculture section of the Handbook.

Table 1: Tasks and timeframe for the work of TG-aquaculture

| | Task | Timeframe |
|----|--|------------|
| 0. | Develop draft ToRs and work plan in consultation with TG Convener and circulate to members for validation. Call for TG participations and their contact details. | March 2021 |
| 1. | Finalise ToRs and establish TG membership | April 2021 |



| | Task | Timeframe |
|-----|--|--|
| 2. | Critically review the draft aquaculture components of the Handbook which were presented at CWP-24 in 2013 and the CWP intersessional meeting in 2017, consider recent guidance on concepts, topics and structure from CWP-26, and develop a revised structure for the aquaculture components of the Handbook | June 2021 |
| 3. | Concurrently with 2, finalize the updates to the international classification or reference list of Farming systems which may guide the development of the aquaculture section of the Handbook | September 2021 |
| 4. | Draft the aquaculture components of the Handbook including the introduction, general concepts and socio-economic dimension | September 2021 |
| 5. | Circulate the first draft of the revised Handbook sections | October 2021 |
| 6. | Consider further development to the Handbook sections, including review and further develop the Handbook's tools and resources, and develop the Handbook's keywords and search terms applicable to all aquaculture-related sections of the Handbook. | Prior to the intersessional meeting (IS) |
| 7. | Concurrently with 6, consider implications of any revised aquaculture concepts and definitions in the work of other TGs including TG-RH2 | Prior to IS |
| 8. | Present an advanced version of revised aquaculture Handbook and definitions at the intersessional meeting (IS) | IS November 2021 |
| 9. | Consider further developments including intersessional meeting feedback and enlarging the scope of contributions to other CWP parties | Post IS |
| 10. | Incorporate relevant outputs of other TGs including TG-RH2 | Post IS |
| 11. | Present a final version of the revised aquaculture components of the Handbook to CWP-27 for consideration and, if possible, adoption | By mid-2022 |

Activities up to the CWP Intersessional Meeting

2.2. First critical review of the draft Handbook

Based on the above, a first critical review was carried on the five sections of the draft Handbook out by early July 2021 and included:

- preliminary comments regarding the previous version including on different aquaculture data collection systems; aquaculture practices and farming systems, operations, classifications; methodological issues that are specific to aquaculture statistics; common standards, including classification and codes applied.
- incorporate all the outcomes of CWP-26 (e.g.: on ISSCAAP classification, international aquaculture farming systems classification and socio-economic data proposed during the session);
- identification of missing, outdated, or redundant information in the document;
- identification of criticalities and amendments;
- propose a new structure and layout of the Handbook;
- enrichment with the appropriate infographic; hyperlinks, glossary, and bibliographical references.



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The critical review highlighted the importance to better retain the objective of the Handbook with the need to shorten and/or delete some topic, while further expanding and elaborating other key concepts and definitions.

In addition, several examples were provided and, as the Aquaculture Handbook should represent a global framework, it would be essential to gather and include as many experiences as possible to cover aquaculture practices in the different geographical areas worldwide.

Subsequently and in coordination with the CWP Secretariat, the CWP-AS Coordinator convened the TG-aquaculture to advice on the comments/changes made in the document and/or include additional suggestions and comments by mid-August 2021. The draft Handbook with the results of the preliminary review (including consolidated comments at the end of each section for ease of reference, and other proposed changes directly in the text), was then shared with: (i) experts from CWP member organizations and including the Southeast Asian Fisheries Development Center (SEAFDEC), the Pacific Community (SPC), the European Statistical Office (EUROSTAT), the General Fisheries Commission for the Mediterranean (GFCM); (ii) aquaculture experts and practitioners from several countries in the Mediterranean and the Black Sea, North and South America; North Europe; (iii) FAO staff and consultants.

The consultation confirmed the proposed changes made in the document that emerged from the critical review. Furthermore, beside direct comments on the text, several recommendations were received and that were summarized in the Table reported in Annex 2.

2.3 Coordination and harmonization of the Handbook with other TGs

According to the ToRs of the TG-Aquaculture, collaboration with TG for capture fisheries was established through the expert in charge of developing the revised Handbook on Fishery Statistics. In this context, the sections of the Handbook already revised (currently at pre-publication stage) was duly taken into account to ensure overall consistency and harmonization with the Aquaculture Handbook. These sections included: (i) Introduction (data collection systems; methodology for data collection; confidentiality); (ii) General concepts (conversion factors; date and time; currencies and funds; spatial reference systems; geographic coordinates; geographic systems; country or area; main water areas; identifiers for aquatic animals and plants); (iii) Socio-economic dimension (fisheries production; aquaculture production; food balance sheets on apparent consumption; fishery commodities classification).

2.4 Cooperation with FAO initiatives

FAO is currently preparing the Guidelines for Sustainable Aquaculture (GSA - <https://www.fao.org/in-action/gsa/background/en/>) following the recommendation of the last session of the FAO Committee on Fisheries (COFI). The GSA includes a chapter on aquaculture data and statistics, and in this context the CWP-AS Coordinator contacted the expert who is preparing this chapter to explore how the Handbook and the GSA could cooperate on similar topics related to aquaculture statistics, also to ensure consistency of approach and contents. A tele-meeting was held, relevant documents were exchanged, and the expert was invited to attend the intersessional meeting in November 2021.

2.5 CWP-IS Meeting Observers

TG-Aquaculture liaised with a number of aquaculture experts and practitioners in the region and invited them to provide feedback on the draft Handbook and invited them to attend the CWP-IS Meeting. The fruitful cooperation contributed to enrich the draft version of the Handbook.



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Activities post CWP-IS Meeting

2.6 *Feedback from experts on the draft Handbook*

Following the CWP-IS Meeting, an initial further revision of the draft Handbook was commenced and the revised draft shared with CWP Parties. Written feedback was received before the end of 2021 and duly taken into consideration in the draft Handbook. CWP Parties were also informed that early 2022 a series of bilateral meetings would be organized in the forthcoming intersessional period to discuss the progress on Handbook finalization in more detail.

2.7 *Cooperation with FAO initiatives*

In March 2022, a thorough review was undertaken to the latest draft of the “GSA Chapter 10. Aquaculture Statistics and Information” to ensure consistency with the Handbook.

2.8 *Intersessional meetings with CWP Parties*

Starting from February 2022, a series of bilateral consultations/liaisons with CWP Members were planned to discuss in more details the draft Aquaculture Section of the CWP Handbook for its further revision before being presented at the next CWP 27th Session in June 2022. The following CWP Members were consulted:

- General Fisheries Commission for the Mediterranean (GFCM)
- Network of Aquaculture Centres in Asia-Pacific (NACA)
- Statistical Office of the European Communities (EUROSTAT)
- Southeast Asia Fisheries Development Centre (SEAFDEC)
- Pacific Community (SPC)

The objectives of the meetings were: (i) recap the overall activities undertaken by the CWP-AS; (ii) inform on the current status and progress of the draft Aquaculture section of the Handbook post Intersessional Meeting; and (iii) propose further suggestion on the Handbook and discuss the next steps for cooperation post CWP 27th.

The meetings summed-up the main activities undertaken by the CWP-AS and inputs already received from CWP Members and included in the draft Handbook, the main task ahead was now to finalize the Handbook while other proposals received would be proposed for next phase post CWP 27th Session. Subsequently it was presented the main steps that were undertaken on the revision of the Aquaculture Section of the CWP Handbook towards the finalization and presentation at the next CWP 27th Session. In particular it was recalled the outcomes of the CWP Intersessional Meeting last November and the proposed changes raised by CWP Members.

It was delivered a comprehensive presentation on the latest version of the draft Handbook highlighting the reasons underpinning the revision being made on the 2013 version, as well as the main changes already made including on: (i) terms and definitions, (ii) accounting and codes for aquatic productions, (iii) accounting aquaculture productions, (iv) socio-economic aspects of aquaculture, (v) minimum reporting requirements, (vi) beyond minimum requirements, (vii) data collection and planning and implementing surveys. Furthermore, the bilateral meetings were informed that the current categorization of the farming systems is consolidated into 12 categories, whilst the detailed lists of the farming systems will remain.

The main points raised during the bilateral meetings considering also as post 27th CWP session, are



reported in Table 2:

Table 2: Important points raised during the bilateral meetings

| N. | Point raised | Action |
|----|--|--|
| 1 | There is consistency between the provisions of the Handbook and the GFCM Information System for the Promotion of Aquaculture in the Mediterranean (SIPAM). It would be desirable to present the Handbook to SIPAM National Focal Points to gather their comments and feedback. | Present the draft Handbook during the 12 th Session of GFCM Scientific Advisory Committee on Aquaculture (CAQ) in June 2022 (see further below). |
| 2 | To have a shared document repository accessible by CWP parties containing the latest working version of the draft Aquaculture Section of the CWP Handbook. | A document repository was created to share the draft Handbook |
| 3 | It was proposed to consider two targeted case studies to bring the data to life and/or put the numbers in context: (i) for the socio-economic and nutritional impact of small-scale production on rural communities (e.g. 4.2), (ii) periodic surveys of production losses and practices/causes in different sectors (e.g. 3.5). | The meeting acknowledged the proposals and informed that they would be discussed at the CWP 27 th Session and possibly considered in the next phase post CWP 27 th . |
| 4 | EUROSTAT expressed the interest to strengthen cooperation with the FAO Statistics Team on the aspects related to sharing and harmonisation of statistical data. | Strengthen cooperation between EUROSTAT and CWP. |
| 5 | Clarify better in the Nature and Scope section that the Handbook is to be considered guidelines for countries. | Modify the Handbook as appropriate. |
| 6 | Whether the FAO questionnaire that each country is asked to compile, would be modified after the formal adoption of the Aquaculture section of the Handbook. | Point to be clarified at the CWP 27 th Session. |
| 7 | More work will have to be done after the adoption of the Handbook to support countries in order to operationalize its provisions and answer questions such as: (i) how to manage and interpret the collected data? (ii) different methods on how analyse trend of aquaculture? (iii) which statistics indicators could be adopted to monitor aquaculture development, sustainability and production? | Proposal to be discussed at the CWP 27 th Session and possibly considered in the next phase post CWP 27 th . |

2.9 Coordination with the ad-hoc Task Group on reference harmonization (TG-RH2)

A meeting including TG-AS and TG-RH2 was held in order to ensure coordination and consistency with the aquaculture section of the handbook to the work of the other TGs. All the aspects related to harmonization were shared and discussed, including the proposal that was made for data structure on global aquaculture production, summarizing the main standards to be taken into account. It was concurred the aquaculture statistics and therefore the handbook were lacking of a defined code lists for some of the basic concepts (e.g. environment, types of farming/production), the gap might be filled in the next session as the work on farming system classification is finalized. Discussions over specific issues as the need for “flag status” as the one in use for the fishery section, the reference



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system for the measuring units as well as “flags” for defining matters of confidentiality and quality of the data were discussed and taken into consideration in the draft Handbook. For the flag status it was concurred that, although at the moment it is not applicable, it might be used in the future when the aquaculture carried out in fish farm vessels will be more wide spread.

2.10 Presentation of the draft HandBook to the GFCM Scientific Advisory Committee on Aquaculture (CAQ)

The draft Handbook was presented at the “Meeting on aquaculture market data” that was held on 6 June 2022 in Casablanca (Morocco) in occasion of the 12th Session of the GFCM Scientific Advisory Committee on Aquaculture (CAQ). In particular the Handbook was introduced in relation to the Information System for the Promotion of Aquaculture in the Mediterranean (SIPAM)¹ and the National Focal Points to enhance collection of data and information on all aspects of aquaculture in the GFCM contracting parties. SIPAM is the official aquaculture information system through which countries contracting parties submit their data on aquaculture to the GFCM by officially appointed national professionals defined as National Focal Points. The fruitful cooperation between GFCM and the FAO Coordinating Working Party on Aquaculture Statistics has been in place for years and it ensures consistency in standards in aquaculture data collection and statistics. Feedback and comments stemming from the meeting were included in the draft Handbook as appropriate. At the end of the meeting some SIPAM National Focal Points expressed their interest to attend as observers the CWP 27th Session.

¹ SIPAM URL: <https://www.fao.org/gfcm/activities/aquacultureoriginal/sipam/en/>.



2.11 Final draft of the Aquaculture Section of the CWP Handbook

Since March 2021 until June 2022, the draft Handbook underwent a thorough revision, which has taken into consideration the work done by TG Aquaculture and experts team, as well as all the inputs received by CWP Parties and other experts, as hereafter summarized:

Pre CWP-IS Meeting

After the first findings of the critical review and according to the detailed recommendations received (Annex 2), the TG-AS carried out the further revision, amending, restructuring, updating and adding relevant information where necessary. More specifically, the following activities were carried out:

- Rearrange the overall structure of the Handbook by shifting and merging chapters as appropriate to improve readability;
- Reconsider chapters that were evaluated to be misleading for the purposes of the Handbook;
- Widen the contents of the initial chapters by adding new subsections to present the framework of the handbook (list of tables, figures and annexes; preface; executive summary; why collecting aquaculture data; handbook preparation and background; nature and scope; institutional benchmarks);
- Replace dated figures with updated infographics and drawings/figures;
- Add updated terms and definitions, a practical guidance glossary and related bibliographic references;
- Provide updated hyperlinks to relevant documents and websites;
- Provide tables with proposals for data collection;
- Add highlighted boxes pointing to the core message and interpretations for statistical purpose and ease of reference during data collection.

Post CWP-IS Meeting

The following changes were made:

- It was clarified better in the “Nature and Scope” section how the Handbook is to be considered as a tool and a guideline for implementation of aquaculture statistics by countries after the endorsement, without modifications over other statistical data collection implemented at international level (*e.g.* FAO questionnaire).
- The section on “Veterinary drugs in aquaculture” was moved from chapter 6 “Beyond Minimum Requirement” to the appropriate main Chapter 5 focused on the minimum reporting requirement for statistics on aquaculture.
- The section related to “Climate change” in “Beyond minimum requirements” Chapter 6 was removed from the Handbook: This topic was early added addressing experts’ requests received during the review phase of the handbook. However, the chapter was subsequently deleted following the suggestion of the IS Meeting in November 2021 due to the vast amount of variables to be collected to track the effects of climate change on aquaculture.
- The section on “Use of Spatial Information Technology”, section 6.5 of the Handbook, was aligned in principles and basic concepts to the Fishery Section of the Handbook and then further developed thanks to the collaboration with the GFCM.
- Section 5.3 “Data flags: transparency and confidentiality” was included thanks to the alignment with TG-RH2 to address the issue of data flags for defining the levels of confidentiality as well



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as the status of the observed values (*e.g.* missing, estimated, not relevant etc.) making reference to internationally recognized coding systems.

The result of the overall work is the revised final draft Handbook which holds the initial structure but presents the findings in a more direct form, avoiding redundancies, offers updated definitions, categories and codes following the latest work within the framework of the CWP and guides the reader through detailed tables and examples.

The revised final draft Handbook is available as Meeting Document CWP-IS/2022/6 and the Executive Summary is reported in this document as Annex 1.

3. NEXT STEPS

Provided that the draft Handbook is endorsed by CWP 27th, further activities post CWP 27th could be undertaken in order to provide support to members and practitioners using the Handbook. Several suggestions stemmed also as a result of the bilateral meetings with CWP Parties. The following could be considered for the future workplan of TG-aquaculture:

- Development of coding for the classification of farming systems including the sub-categories;
- Improve the collection of data in terms of production and market value of commodities from aquaculture such as fry and fingerlings, sturgeon caviar and other traded fish eggs (*e.g.* trout, salmon, etc.), fishery products from aquaponic, etc.
- Contribute to the revision of CWP webpages to improve content and coverage including the Aquaculture Section of the CWP Handbook;
- Develop tools (manuals, guidelines, etc.) to operationalize the aquaculture section of the Handbook such as: (i) how to manage and interpret the collected data; (ii) data analysis; (iii) what is the trend of aquaculture?
- Develop suitable indicators that could be used/applied to monitor aquaculture development, sustainability and production over time;
- Identify targeted case studies: (i) periodic surveys of production losses and practices/causes in different sectors (*e.g.* section 3.5); (ii) socio-economic and nutritional impact of small-scale production on rural communities (*e.g.* section 4.2).



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ANNEX 1

Executive Summary of the Handbook

The Handbook on Aquaculture Statistics was born with the objective to serve as a practical reference document for all national authorities involved in the compilation of aquaculture statistics and for the data users and support the establishment of appropriate mechanisms such as databases and information networks to collect, share and disseminate data related to the aquaculture activities. All of these in consideration of the relevance of aquaculture in contributes to food security, poverty alleviation, economic development and social wellbeing of many people in the world. For effective management of aquaculture within national policy, it is necessary to monitor a full spectrum of such contribution. The need of collecting data regarding production, species and geographical feature of the aquaculture sector is deeply enshrined within the principles provided by the Code of Conduct for Responsible Fisheries² (FAO 1995).

In consideration of the above and to fulfill the needs of countries, the Handbook on Aquaculture Statistics takes into account relevant international instruments and milestones that provide the underlining principles upon which the handbook is based, in particular those related to sustainable aquaculture development.

For these purposes, the Handbook comprises seven chapters covering a range of basic concepts, definitions, standard classifications and corresponding codes, and data exchange protocols as applied to aquaculture data collection and statistics.

Chapter 1: Terms and Definitions includes the main aspects of aquaculture and aquaculture stages, defining the different management phases (for: broodstock, hatchery, nursery and grow-out), by giving also some examples. In addition, the information on how to indicate the different life stages are supported by a practical glossary for the classification of fish resources in aquaculture. In the chapter are indicated the different production systems and practices, from small-scale back-yard ponds to highly sophisticated industrial production units. It also includes the used different classifications based on the number of species farmed (monoculture and polyculture including culture practices such as rice-fish farming and IMTA) and on intensity of the culture (i.e. extensive, semi-intensive; intensive). A paragraph is also dedicated to the different aspects of interactions between aquaculture and capture fisheries, particularly where both are inter-dependent (i.e. culture-based fisheries and capture-based aquaculture).

Chapter 2: Accounting and codes for aquatic productions, focusing on minimum administrative data related to farms and to all the aspects of the different codes and attributes normally applied for aquaculture statistics. In order to achieve an efficient analysis of the data gathered, aquaculture items are catalogued under the proper identifiers, thus allowing a fast and accurate statistical analysis. In this respect references are done to ASFIS Reference Series FAO that produced a “List of Species for Fishery Statistical Purposes”. The culture environments are also defined according to the salinity of water that is mainly utilized at the farming facilities, noting that a utilization of multiple types of water within a single farming unit is not unusual. Indications are given to countries to report aquaculture products asked by FAO according to their location of harvest by using FAO Major Areas for Statistical Purposes that are listed in the handbook. For statistical purposes, they were considered the 27 FAO Major Areas that were established to describe global distribution of fishery and aquaculture production, with eight inland areas corresponding to the inland waters of the continents and nineteen marine areas covering the waters of the Atlantic, Indian, Pacific and Southern Oceans with their respective adjacent seas. Indication is also given on the Time unit used on Aquaculture production that can be measured either based on a life



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cycle of cultured organisms or based on a certain time period, e.g. year, quarter, months etc. In this chapter, the farming systems in aquaculture are clustered according to the different farm facilities or devices that are utilized to contain the cultured organisms, irrespective of the stage of its life cycle, in each space. For statistical purposes, it is suggested to cluster the farming facilities into 15 groups, one of each distinguished in different typology. Chapter 2 is closed by giving information for one of each typology the measuring units to be considered in terms of quantity (number); water surface area (hectares or squared meters); water volume (cubic metres).

In Chapter 3: Accounting aquaculture productions, the types of information needed to monitor aquaculture sector are described and what information and data are relevant to be considered and collected for statistical purposes either as food or for non-food use. Aquaculture inputs and outputs are considered separately. The handbook considers three general categories for Aquaculture harvest (aquaculture output harvest) namely, production for food, production for non-food uses, and production of seed for further aquaculture practices (e.g.: for release into the environment, and other uses) and are indicated the necessary statistics information to quantify the gross harvest, i.e. production, in each category. About the production for human consumption, all statistics of quantity and value of products should be stratified by species, environment, farming systems and destinations. Here, the destination is indicated that could be two folds; i) for domestic markets (local use) and ii) for international markets (exports). The non-food use products are classified in ornamental, raw materials for jewellery, apparel, handicraft, industrial use and others. The production for seed is classified, together with broodstock and adult specimens for a final grow-out. Seed production is often measured by numbers, although both may be applicable for broodstock or adults and are classified according to the final use (e.g.: released into the environment for different purposes, destination, etc.). For aquaculture inputs to aquaculture stocks it is intended the different kind of seeds and could be considered for different stages, destination and purposes (e.g.: stock of aquaculture fish resource from fertilized eggs to post-larvae (shrimp), spat (molluscs), glass eels/elvers (eels), smolts (salmon), fry and fingerlings (finfish), spores/seedlings (seaweeds), etc. depending on the type of species cultured.

Chapter 4: Socio-Economic Aspects Of Aquaculture informs on the need for Census and Structural Business Statistics surveys that may provide an opportunity to collect such information extensively but such census/surveys only occur with certain rather long intervals. These typologies of data are also useful to monitor changes of key indicators between census/survey during the years. In the chapter are described the different variables to be collected on economic performances in aquaculture. This information regards also the kind of employee data to be collected and may include age, gender, average wage, and educational level, together with number of people engaged by these categories.

Chapter 5: Minimum Reporting Requirements For National Statistics On Aquaculture summarizes the information on the data that are necessary to collect at country level. These should be considered as minimum reporting requirement to ensure consistency and comparability among different national aquaculture statistics and to enable regional and global analysis. In particular in the chapter are made reference to the different criteria applied in specific subparagraphs of the Chapter 3 and Chapter 4 in the handbook, including the Criteria applied and Unit to be considered for the reporting requirement (measuring units). In order to have a practical use of the Handbook, in this chapter are also given examples to the single data sheet to be filled for reporting. To fulfil the reporting requirements the matter of confidentiality classifications and flags on the status of an observed value is tackled.

In Chapter 6: Beyond Minimum Requirements are indicated a series of other key factors that could be useful to monitor in aquaculture. These data are not specifically necessary for statistics purposes but could be considered to have a better monitoring, management, development and planning of the



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aquaculture sector. The availability of these data could give a more accurate information on the input requirements for practicing aquaculture.

In Chapter 7: Data collection and planning and Implementing Surveys indicates a broad methodology to carry out an aquaculture census is provided. The aquaculture data are part of the framework of the wider agriculture census, with a set of data presented in the Global Strategy of improving agricultural and rural statistics, adopted by the United Nations Statistical Commission in 2010. World Programme for the Census of Agriculture (WCA) is further detailed in its section addressing aquaculture.



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ANNEX 2

Main recommendations from CWP and other experts consultation on the draft Handbook

| Section/Subject | Recommendation |
|--|---|
| General layout | In its initial and final part, the handbook can also include introductory and background elements, which follow those currently present, but which are limited in scope so as not to distract too much from the practical objective of the handbook. |
| Definition of terms | This should be a single chapter (no repetition) in which widely accepted / shared terminologies are summarized. In case new definitions need to be given, it is in the remit of the handbook to do so. Not giving the necessary definitions to those who must collect the data does not allow there to be a robust system for systematic data collection that is the goal of the handbook. |
| Definition of the data to be collected/ Questionnaire | Include examples of questionnaires that have been filled. The necessary data must be fully described giving clear examples and illustrating specific examples in detail. Furthermore, the use of post-collection data should be described in a way that the intention of how the data will be used is clear, in order to help those who collect it to understand what data is needed. |
| Instructions on how to collect data | Unlike the present structure, the handbook should use tables in which all types of data to be collected can be recorded and it is important that the terminology introduced (Definition of terms and Definition data) in the previous sections is strictly respected in the tables. |
| Specific variables to be collected for climate change | Collect environmental variables data during the production cycle to account for the effects of climate change that have become increasingly noticeable: (i) min-max temperature; (ii) number of days with oxygen drops; (iii) min-max salinity; (iv) mortality due to extreme events; (v) min-max water level; (vi) min-max water transparency (with Secchi disk). |
| Aquaculture classification | Regarding the classification of aquaculture according to the intensity of culture practices, it should be added a rough quantification of the 3 different categories e.g. percentages of worldwide aquaculture production coming from extensive, semi-intensive & intensive cultures. |
| Classification of farming systems | Align the chapter to the latest work of CWP. Regarding the classification of farming systems, the specific reference and definition of "raceways" should be omitted, since raceways (or raceway tanks) are nothing more than tanks with the shape of a raceway, therefore they are 100% covered by the previous definition of the tanks. Classifying them as a separate system does not offer anything practical and it may just confuse the reader. |
| Measuring units | The handbook should include a clear focus on measuring units for the different farming system, a guidance chapter is necessary as the matter is often scattered among different parts of the document. |
| Farm-gate value | Where it is mentioned the farm-gate value, it may also be added in parenthesis the term "ex-farm" which is a synonym to the farm-gate value and is more commonly used, especially regarding the ready product. |
| Chapter on Investment | Regarding the chapter on "Investment", it is concurred that such information is not necessary for the present Handbook as it shall only perplex the readings and the collection of data and it also escapes the basic purpose of such a Handbook. |
| Chapter on Feeds and Fertilizers | Regarding on the chapter on "Feeds and fertilizers", it is agreed that this is indeed a very difficult matter to be assessed but also a very important one and also it is agreed upon with the categorization provided in the related comment but the whole issue probably needs further discussions. |
| Chapter on | Concerning the chapter on "Antibacterials", it is suggested that this chapter should |



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| Section/Subject | Recommendation |
|---|--|
| Antibacterials | remain in the Handbook, emphasizing however in the text (which needs full revision and re-writing) that, generally, during the recent years bigger and bigger attention is given in decreasing the usage of antibiotics, replacing them more and more with vaccines, which have also proven to be much more cost-effective for the producers than antibiotics/antibacterials and that there is a clear tendency internationally to rationalize (if not minimize) the usage of antibiotics. |
| Chapter on Use of spatial information technology | About chapter on "Use of spatial information technology" there is consensus on the existing text and with the comment that further detailed discussions may be needed. |
| Technical statistical parts | It is suggested that the technical statistical parts are strengthened while referring to the FAO Statistics Quality Assurance Framework (SQAF), particularly the principles which are outlined in the Annex 1 of the FAO SQAF which is available at: (http://www.fao.org/3/i3664e/i3664e.pdf). |
| Socio-economic aspects of aquaculture | Align the chapter to the updated work of CWP regarding gross value of production, employment and additional variables. |