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منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Organización de las Naciones Unidas para la Agricultura y la Alimentación

FISHERY COMMITTEE FOR THE EASTERN CENTRAL ATLANTIC

Twenty-second Session

Libreville, Gabon, 17-19 September 2019

Main outcomes of the eighth session of the Scientific Sub-Committee

SUMMARY

This document is the summary of the final report of the eight session of the Scientific Sub-Committee of the Fisheries Committee for the Eastern Central Atlantic (CECAF), which was held in Abidjan, Côte d'Ivoire from 23 to 26 October 2018. An advanced copy of the final report is available (CECAF/XXI/2016/Inf.1). The SSC was immediately preceded by a one-day meeting, on 22 October, on the EAF-Nansen Programme and upcoming survey related activities in the CECAF region. Major topics discussed at the 8th session were: (i) the reports of the assessment Working Groups on small pelagics and demersal species, as presented by the subgroups, and the report of the artisanal fisheries Working Group; (ii) fishery management advice in the CECAF region; (iii) reporting on the state of resources for the CECAF area and considerations for a revised advice framework; (iv) overview and coordination of ongoing research activities; (v) CECAF-FIRMS fisheries inventories; (vi) overview of CECAF statistics; (vii) deep-sea fisheries and vulnerable marine ecosystems; (viii) report of work of other projects/programmes in the CECAF region, report of work of research institutions or scientific groups in CECAF member countries; and (ix) future programme of work in the region.

OPENING OF THE SESSION

1. The eighth session of the Scientific Sub-Committee (SSC) of the Fishery Committee for the Eastern Central Atlantic (CECAF) was held at the Palm Club Hotel in Abidjan, Côte d'Ivoire from 23 to 26 October 2018. The SSC meeting was preceded by a one-day meeting, on 22 October, on the EAF-Nansen Programme and upcoming survey work in the CECAF region.

2. Mr Kossi Maxoe Sedzro of Togo chaired the Session. A total of 48 participants from 21 CECAF Member countries and representatives from the Subregional Fisheries Commission (SRFC), the Ministerial Conference on Fisheries Cooperation Among African States Bordering the Atlantic Ocean (ATLAFCO), INFOPECHE, the Benguela Current Convention (BCC), the Canary Current Large Marine Ecosystem (CCLME) Project, the EAF-Nansen Programme, the FAO Fisheries and Aquaculture Department, the FAO Regional Office for Africa, and the FAO Sub-regional office for Central Africa, attended the Session.

3. On behalf of the Director-General, Mr Graziano Da Silva, the FAO Representative to Côte d'Ivoire, Mr Germain Da Silva, welcomed the participants on behalf of FAO and thanked the Government of the Republic of Côte d'Ivoire for hosting the eighth session of the SSC. He also thanked the funding partners, the European Union and the EAF-Nansen Programme for their continued support to CECAF. Mr Da Silva remarked that their support clearly reflects strong hope that CECAF will continue to add value and provide services to countries in their efforts to improve food security and fisheries management. In the address, the key role of the SSC in providing scientific advice to the Committee and its members in support of improved fisheries management decisions was stressed, and the importance of emphasizing that management decisions are made on the basis of information from the fisheries sector and scientific research.

4. On behalf of His Excellency, the Minister of Higher Education and Scientific Research of Côte d'Ivoire, the Deputy Director of Cabinet, Professor Yodé Simplice Dion, expressed delight for the choice of Abidjan to host the Session. After welcoming all participants, he thanked FAO for its continued commitment to the Government of Côte d'Ivoire in its efforts to promote and develop agriculture, the protection of environment and fisheries and aquaculture development. Referring to the mandate of CECAF and its consultative body, the Scientific Subcommittee, he stressed the urgent need to improve the functioning of CECAF to respond more efficiently to the requirements of sustainable management of fisheries. Thus, and before officially declaring the Session open, he invited scientists, administrations and fisheries managers to take up the major challenge of translating the recommendations of the scientific sub-committee into operational management plans.

MAIN OUTCOMES OF THE WORKING GROUPS

5. The **three assessment categories** adopted by the CECAF scientific Working Groups were recalled:

   • **Non-fully exploited**: When the stock is in good condition and fishing pressure can be increased without affecting the sustainability. All increases must be seen in the context of the general environmental situation.

   • **Fully Exploited**: The fishery operates within the limits of sustainability. Current fishing pressure seems sustainable and can be maintained.

   • **Overexploited**: The fishery is in an undesired state both in terms of biomass and fishing mortality. Fishing pressure should be reduced to allow the stock to grow.

6. It was further noted that the Working Groups have adopted the following Biological Reference Points (BRPs):

   • **Target Reference Points**: $B_{0.1}$ and $F_{0.1}$
   • **Limit Reference Points:** B_{MSY} and F_{MSY}

7. The target reference points indicate the ideal situation for the stocks whereas the limit indicate that the situation that we do not want to surpass.

8. The Groups presents for each stock estimates of:

$F_{cur}/F_{0.1}$: Ratio between the fishing mortality coefficients observed for the last year of the series and $F_{0.1}$.
$B_{cur}/B_{0.1}$: Ratio between the estimated biomass for the last year of the series and the biomass corresponding to $F_{0.1}$.

Where:

$F_{0.1}$ - level of fishing mortality at which the slope of the Y/R curve is 10% of the slope at the origin
$B_{0.1}$ – is the value of B corresponding to **$F_{0.1}$**

9. Management advice for the stocks is given in relation to the reference points and on the basis of long-term and short term projections.

A) SMALL PELAGICS WORKING GROUP – NORTH

10. The 2018 Working Group was preceded by a workshop where participants reviewed the 2017 survey data from the R/V *Dr Fridtjof Nansen* for the northern region of CECAF. A working document was prepared that summarizes the results of the survey of pertinence to the Working Group.

11. Catch trends between 2016 and 2017 remained stable at around 2.7 million tonnes. Total catch of small pelagic fish for the period 1990–2017 has been fluctuating with an average of around 1.9 million tonnes, while the average for the last five years was 2.5 million

tonnes.

12. In addition to the traditional assessment models applied in the past Working Groups, a special focus was given to exploring possible options for alternative assessment methods for the different species, following up on recommendations from the CECAF Expert Group meeting on assessment methods (FAO, 2015) and the seventh session of the SSC.

Sardine

13. The status of the sardine (*Sardina pilchardus*) stock in zones A+B is continuing to improve, and the stock was considered to be not fully exploited. However, given the instability of this resource with regard to environmental changes, a precautionary approach was adopted and a catch limit for sardines in zones A+B was set as the same level as for 2016 and 2017, with around 550 000 tonnes being recommended.

14. The sardine stock in Zone C was considered to be not fully exploited. The stock is influenced by environmental factors and shows fluctuations independent of fishing. While no specific catch limit was provided, considering the observed fluctuations, it was recommended that total catch should be adjusted according to observed natural changes in the stock. The stock structure and abundance should be closely monitored by fishery-independent methods covering the complete distribution area.

Sardinella

15. The assessment of sardinella species (*Sardinella aurita* and *S. maderensis*) continued to pose a problem for the Working Group due to the absence of a reliable abundance indices series. Based on the different indicators available, the Working Group found *S. aurita* to be overexploited, while the state of *S. maderensis* remains unknown. Given the multi-specific nature of these fisheries, and as a precaution, the Working Group recommended reducing both the effort and catches for the two species in all zones and fleet.

Horse mackerel

16. The Cunene horse mackerel (*Trachurus trecae*) and the Atlantic horse mackerel (*Trachurus trachurus*) are overexploited. The Working Group recommended reducing both the effort and catch for the two species at the level of the different zones and fleets.

Chub mackerel

17. The assessment of the Atlantic chub mackerel (*Scomber colias*) indicated that the mackerel stock is fully exploited. In spite of the projection results obtained by two models that indicate different trends, the Working Group recommends as a precautionary approach to renew the recommendation made for the 2017 assessment (340 000 tonnes).

Anchovy

18. Anchovy (*Engraulis encrasicolus*) is considered to be fully exploited. Although there was a decrease in fishing mortality in 2017, the Working Group recommended that current effort should be reduced, and be adjusted for the long-term according to the natural fluctuations in this stock.

Bonga

19. The results of the assessment show that bonga (*Ethmalosa fimbriata*) is overexploited. Despite the recommendation of 2017 to reduce the effort, the Working Group noted a strong increase in catches and fishing effort in 2017 compared with 2016. The Working Group recommended that effort and catch be reduced relative to current levels.

B) SMALL PELAGICS WORKING GROUP – SOUTH

20. The 2018 Working Group was preceded by a two-day workshop where participants reviewed the 2017 survey data from the R/V *Dr Fridtjof Nansen* for the southern region of CECAF.

21. This Working Group noted in particular the constraints related to the lack of or limited access to data for the assessments, and that several working group member countries did not make the requested data available to the Working: hence, out of the 16 stocks that the Working Group assessed, six remained either unassessed or with inconclusive results.

22. There was a decrease of 46 percent in total catches of the main small pelagic fish in 2017 compared to the total catch from the last year assessed (2012), from 760 000 tonnes in 2012 to 350 000 tonnes in 2017. The trend observed since 1999 is rather stable, however there has been a decrease in most species after 2016. It is important to note that only some of the species had updated data to 2017. Average total catch of small pelagic fish for the period 1990–2017 was about 547 000 tonnes.

23. The main small pelagic fish species studied by the Working Group are: the round sardinella (*Sardinella aurita*), the flat sardinella (*Sardinella maderensis*), bonga (*Ethmalosa fimbriata*), anchovy (*Engraulis encrasicolus*) and horse mackerel and other Carangidae. The Working Group considers four sub-areas: North (Guinea, Guinea Bissau, Sierra Leone, Liberia), West (Côte d'Ivoire, Ghana, Togo, Benin), Central (Nigeria, Cameroon) and South (Republic of the Congo, Democratic Republic of the Congo, Gabon and Angola).

24. Thus, sixteen stocks (7 species/species groups) were assessed using fisheries data and survey data from the *R/V Dr Fridtjof Nansen*.

25. The results of the assessment were:

    a. **four stocks are overexploited** – *S. aurita,* western stock; *S. maderensis*, western stock; and *Trachurus trecae* for the northern and southern stocks;
    b. **two stocks are fully exploited** - *Sardinella* spp., southern; and *Decapterus* spp. northern stock;
    c. **four stocks are non-fully exploited** – *Sardinella* spp. northern and southern stocks; Bonga, southern stock; and Anchovy for the western and southern stocks;
    d. **six stocks were not assessed or had inconclusive results** – *S. aurita,* central stock; *S. maderensis* central stock; Bonga, northern, central, and western stocks; and *Trachurus trecae,* western stock.

26. The Working Group recommended that catches of overexploited stocks should be reduced, and not exceed the average of the last five years.

27. Following the presentation, questions and concerns were raised related to inadequate or lack of data for assessing the stocks, and all members agreed on the importance of ensuring that the Working Group has available the necessary data for the assessments.

28. Discussions also focused on the issue of species-separated data, in particular for *Sardinella* spp. It was noted that in some sub-regions, at the beginning of the time series the species were separated into *Sardinella aurita* and *Sardinella maderensis*, however more recently the two species have been grouped together under *Sardinella* spp., and that this makes the assessments difficult to conduct.

29. The Working Group recommendation to close the fisheries for the western stocks of *S. aurita* and *S. maderensis,* and how this can be operationally achieved, was the focus of some discussion. It was noted that the necessary measures could vary between stocks and regions and would also require broader consultations with stakeholders to consider socioeconomic issues, for example. Ghana informed the SSC they are considering to implement temporary measures for these stocks in their EEZ.

C) DEMERSAL SPECIES WORKING GROUP – NORTH

30. In addition to the traditional assessment models applied in the past Working Groups, two new models for data-poor fisheries were tested. In all, 26 stocks were analyzed.

31. Total catches of demersal resources analyzed by the Working Group attained 217 000 tonnes in 2016, and increased by 10 percent in relation to 2015. From 2012 to 2016, the demersal catch has fluctuated with an average of 191 000 tonnes. The most important group of species in the region is the group of cephalopods, notably the octopus (*Octopus vulgaris*) which represents an average of 35 percent of total catches of demersal resources during the period analyzed.

32. Most of the demersal species show a decline in the last years. Among the stocks assessed, nine are overexploited: Thiof (*Epinephelus aeneus*) in Mauritania-Senegal-Gambia, deep-water rose shrimps *(Parapenaeus longirostris*) in Senegal-Gambia and Morocco, rubber-lip grunt *(Plectorhynchus meditteraneus*) in Morocco, southern pink shrimp (*Penaeus notialis*) in Senegal-Gambia, octopus *(Octopus vulgaris*) stock Dakhla, common cuttlefish *(Sepia officinalis*) stock Dakhla, and white hake *(Merluccius merluccius*) and seabream *(Pagrus* spp.) in Morocco.

33. Seven stocks are considered fully exploited: Black hake (*Merluccius* spp.) in Morocco-Mauritania-Senegal-Gambia, bluespotted seabream (*Sparus caeruleostictus*) in Mauritania-Senegal, axillary seabream (*Pagellus acarne*) in Morocco, southern pink shrimp *(Penaeus notialis*) in Mauritania, octopus (*Octopus vulgaris*) in Cape Blanc, marine catfish (*Arius* spp.) in Senegal-Gambia, and Red Pandora (*Pagellus bellottii*) in Mauritania-Senegal-Gambia.

34. Three stocks were considered as non-fully exploited: Deep-water rose shrimp (*Parapenaeus longirostris*) in Mauritania, common cuttlefish (*Sepia officinalis*) in Cape Blanc and large-eye dentex (*Dentex macropthalmus*) in Morocco-Mauritania-Senegal.

35. Seven stocks had inconclusive assessments: croakers (*Pseudotolithus* spp.) in Senegal-

Gambia, cuttlefish (*Sepia* spp.) in Morocco, octopus (*Octopus vulgaris*) in Senegal-Gambia, cuttlefish (*Sepia* spp.) in Senegal-Gambia, and squid (*Loligo vulgaris*) in Dakhla, Cap Blanc, and Senegal-Gambia. While the models did not provide reliable results for these stocks/species groups, other information from fisheries, scientific surveys, knowledge of the fisheries and passed assessments indicate that these groups of species are likely overexploited.

36. The Working Group recommended to reduce the fishing mortality for all overexploited stocks. For the stocks that are non-fully exploited and for stocks for which reliable results cannot be obtained, a precautionary approach was taken and the recommendation was made that the fishing mortality must not exceed its present level.

D) DEMERSAL SPECIES WORKING GROUP – SOUTH

37. A total of 53 stocks were analysed, of which six stocks could not be assessed because the data available to the Working Group were not sufficient for the assessment models. The Working Group noted that total catch and effort information from some stocks and countries in the region is no longer being collected.

38. Total catches of these resources for the period 1990-2016 fluctuated with an average around 211 000 tonnes. The total catch of demersal resources was around 216 000 tonnes in 2016. A decreasing trend has been seen since 2009, with a sharp uptick in 2013 due to increased catches in Angola, Liberia, and Nigeria.

39. Consistent with previous years, the main assessment model used by the Working Group was the dynamic version of the Schaefer (1954) model. When the model provided inconclusive results for a stock or when stocks could not be assessed due to limited data, the Working Group made recommendations based on previous assessments and trends in available data.

40. Nine stocks were found to be overexploited: grey grunt (*Pomadasys* spp.) in Guinea Bissau; lesser African threadfin (*Galeoides decadactylus*) in Guinea Bissau, the stock in Côte d'Ivoire, Ghana, Togo, and Benin, and the stock in Gabon, Congo, and Angola; the Bigeye grunt (*Brachydeuterus auritus*) in Côte d'Ivoire, Ghana, Togo, and Benin; deepwater rose shrimps (*Parapenaeus longirostris*) in Congo and in Angola; southern pink shrimp (*Penaeus notialis*) in Congo; and pink lobster (*Palinurus charlestoni*) in Cabo Verde.

41. Eleven stocks are fully exploited: Moreias (*Muraenidae*) in Cabo Verde; Croakers (*Pseudotolithus* spp.) in Côte d'Ivoire, Ghana, Togo, and Benin, and the stock in Nigeria and Cameroon; lesser African threadfin (*Galeoides decadactylus*) in Nigeria, Cameroon, and Equatorial Guinea; Sole (*Cynoglossus* spp.) in Nigeria, Cameroon, and Equatorial Guinea, and the stock in Gabon, Congo, and Angola; Bigeye grunt (*Brachydeuterus auritus*) in Nigeria, Cameroon, and Equatorial Guinea; marine catfish (*Arius* spp.) in Nigeria, Cameroon, and Equatorial Guinea; southern pink shrimp (*Penaeus notialis*) in Guinea Bissau; coastal shrimps in Cameroon; and cuttlefish (*Sepia* spp.) in Guinea Bissau.

42. Five stocks are non-fully exploited: red pandora (*Pagellus bellottii*) in Côte d'Ivoire, Ghana, Togo, and Benin); marine catfish (*Arius* spp.) in Gabon and Congo; deepwater rose shrimp (*Parapenaeus longirostris*) in Guinea Bissau; southern pink shrimp

(*Penaeus notialis*) in Gabon; and cuttlefish (*Sepia* spp.) in Ghana.

43. For twenty-eight stocks, the results of the assessments were not satisfactory because of uncertainties in the data available.

44. It was recommended that fishing effort should be reduced for the overexploited stocks or not increased for the other stocks, to avoid further depletion. When possible, recommendations on catch levels are also indicated for each stock. Given that most fisheries in the region are multispecies, an overall reduction in fishing effort is necessary.

45. The European Union requested the SSC to consider including *Aristeus varidens* (Holthuis, 1952), or striped red shrimp, into the assessments of the Working Group.

46. The SSC noted with concern the very poor quality of data provided to the Working Group that resulted in twenty-eight stocks with no assessment results. The SSC recalled and fully supported the recommendation from the Demersal South 2017 Working Group report: *To strengthen the Working Group's capacity and to ensure consistency of knowledge and procedures it is recommended that member attendance is consistent from one meeting to another. Members should ensure that colleagues in national institutions are well informed about the work and the results of the Working Group.*

47. Furthermore, the SSC stressed the responsibility of Working Group members to adhere to the requests for data by the CECAF Secretariat and the Chairs of the Working Group well in advance of the Working Group meetings, and to provide all of the data requested so that they can be cross-checked before the Working Group session.

48. CECAF was also requested to consider the possibility of conducting a gap analysis or a needs assessment of the Working Group members countries in relation to the technical requirements and needed skills for the Working Groups.

E) ARTISANAL FISHERIES WORKING GROUP

49. The fifth session of the CECAF Working Group on artisanal fisheries was held from 26 to 27 July 2018 in Dakar, Senegal. After a period of inactivity, this was the first session of the Working Group after the adoption of the new terms of reference by CECAF in their 21st session.

50. Given the long period since the last Working Group had met, the session focused on setting specific objectives to establish foundations for the Working Group's future. A key activity of the Working Group consisted of identifying priority areas of work in relation to the main areas of work: data collection and analysis, socioeconomics, and environment. To this end, the Working Group developed a Work Plan, that was endorsed at the conclusion of the Working Group, and presented to the SSC for endorsement.

51. In the discussions, the SSC recalled the importance of artisanal fisheries to the region, and expressed their satisfaction for the revival of this working group.

52. Challenges of collecting data for this sector was noted and the SSC recommended the Working Group to undertake a risk-mapping exercise to review possible challenges with collecting and comparing data among countries for the artisanal fisheries sector, in

addition to considering other factors (i.e. climate change impacts).

53. The SSC further recommended the Working Group to proceed with developing a questionnaire that would help the Group implement its workplan.

54. The SSC approved the overall Work Plan for the Artisanal fisheries Working Group and adopted the conclusions of the Artisanal fisheries Working Group.

FORMULATION OF ADVICE ON FISHERY MANAGEMENT MEASURES IN THE CECAF REGION

55. The SSC recognized the need to organize follow up discussions to strengthen collaboration between scientists and fisheries managers to improve the understanding of the scientific advice provided by CECAF, and to support the development of options for how the recommendations can be implemented in practice. It was recognized that the management decisions are taken with a broad range of considerations, including socio-economic issues, and these may vary among regions and stocks. The development/choice and implementation of management measures should be done through a multi-stakeholder process, as recommended under the ecosystem approach to fisheries.

REPORTING ON THE STATE OF RESOURCES IN THE CECAF AREA

56. With the aim of strengthening and improving the work of the Working Groups, external technical reviews of the reports of the different subgroups have been conducted in the past, and the outcome of this external review was reported on and discussed at the seventh session of the SSC, which came up with a set of recommendations for follow-up actions.

57. Actions taken to address these recommendations included informing the different Working Group members of the final outcome of the reviews, and testing of alternative assessment methods (or alternative approaches) during working group sessions. Recommendations related to data availability, research capacity and reporting still remain. to be addressed in a more comprehensive manner.

58. Some actions to address the recurrent issues in relation to data quality could include that members are appointed for a defined period, and that they are made responsible to follow up on any data issues internally within the country and report back on these in the following meeting.

59. The SSC has also been asked by the Committee, with the aim to harmonize research programmes, to look into providing an overview of the current research capacity in the region. While the EAF-Nansen Programme provides some of this support to CECAF, an overview of current research capacity has not yet been prepared. Hence, the SSC was requested to reflect on what such an overview document should contain and how it can be structured, to assist the preparation for the next committee meeting.

60. At its 21st session, the Committee requested the SSC to present a proposal for a revision to the format of the advice and the management recommendations, which should integrate information related to the quality of data, the models used, and other pertinent information that might affect the management advice given to the next session of the Committee. Elements for such a proposal was provided in a draft working document for the

consideration of the SSC.

61. Working Group reports continue to be made available to the Working Group members in draft form after the meeting, whereas the final report is subject to internal technical editing and finalized in English and French. Challenges remains with finalizing reports in a timely manner, due, amongst others, to the increased level of quality checking required to finalize the reports due to amongst the issues highlighted in the paragraphs above.

62. The SSC supported the suggestion of appointing the Working Group members for a given period and endorsed the development of a terms of reference. Furthermore, they suggested that a document should be put together that can guide the work of the members. This may also help to formalize the members' position *vis a vis* potential data providers. A small group consisting of Mauritania, Morocco, Nigeria, Spain and Sao Tome and Principe was set up to follow up on the research capacity assessment and a first proposal for the format of the research capacity assessment was developed. Several countries also committed to provide inputs on the working document on the revised advice framework.

63. With respect to reporting, it was suggested that in addition to the working group report, focus should be on the development of a well-designed management summary for the decision makers, and the CECAF Secretariat committed to develop a proposal to share with the group through correspondence.

REVIEW OF CECAF-FIRMS FISHERIES INVENTORIES ON RESOURCES AND FISHERIES

64. CECAF has a long history of collaborating with the Fisheries and Resources Monitoring Systems (FIRMS), through the production of status reports. An overview of FIRMS and CECAF collaboration was provided in meeting document

65. An overview of FIRMS and the current status of the CECAF inventories was presented, as well as possible areas for further collaboration.

66. CECAF is responsible for the content of the marine resources inventory, which are extracted from the published CECAF Working Group Reports. While countries, with CECAF coordination, are responsible for the content of the fisheries inventory and can update the content on a routine basis. The Chairperson of the SSC is the FIRMS focal point for the CECAF region. Currently, FIRMS has 286 Marine Resource records in the inventory with 172 reports published, and 289 Fishery records in the inventory with 77 reports published as fact sheets. For various reasons, several fishery status reports have not been finally published in FIRMS.

67. The SSC was asked to provide feedback on how current workflow and timeliness of uploading FIRMS information could be improved, and to nominate national focal points for this activity.

68. The SSC was briefed on a possible FCWC-CECAF-FIRMS partnership. Some participants raised concerns on the possible confusion that this new partnership could cause among CECAF and FCWC contributions. It was recommended that CECAF further consults with the countries concerned on this issue to find way forward.

OVERVIEW OF CECAF CATCH STATISTICS

69. The presentation covered the catch trends in the CECAF region for the 2016 data. At present, the CECAF capture database includes data by statistical divisions for 47 years, from 1970 to 2016. Total catches for the CECAF region in 2016 reached 4.8 million tonnes, an increase by almost 10 percent in comparison to the previous year. Shares of total catch by Distant Waters Fishing Nations has been decreasing from 53 percent in 1980 to 17 percent in recent years. The big increase of 2016 catches were mostly due to small pelagics, which on average constitute between 50 and 70 percent of total catches. Over half of catches in the CECAF area comes from the two northern statistical divisions. The CECAF capture database includes catch statistics for 325 species items, with 64 percent of the 2013-2016 total catches reported at the species level.

70. The presentation also focused on FAO's current work, for example the FAO Coordinated Working Party on Fishery Statistics (CWP) data reporting standard work led by FAO, and capacity building projects such as the two technical cooperation projects (TCPs), (in collaboration with COREP and FCWC) aimed at strengthening national fishery data collection systems, through the training of local staff, and application of *Open ArtFish*, and an electronic data collection application. The increase of recorded catches in recent years was also partially a consequence of these two FAO TCPs. In some of the participating countries, better coverage of small-scale fisheries was achieved. The countries partners to these projects expressed their appreciation for this support. The SSC highlighted the importance of bringing these improved data to the Working Groups.

71. The SSC highlighted the need for the harmonization of collection and analysis of data within the CECAF region. It was stressed how this has been an item of discussion in all past Working Groups and SSC meetings.

72. Several Member Countries also highlighted the need for increased focus on socio-economic and catch value data. The availability of fisheries GDP data, and its addition to the database, would increase visibility of the fisheries sector at a national level, and help to advocate for more government support.

DEEP-SEA FISHERIES AND VULNERABLE MARINE ECOSYSTEMS (VMEs)

73. An update of FAO activities on deep-sea fisheries and vulnerable marine ecosystems (VMEs) of relevance to the CECAF region was provided, including in relation to a suite of FAO projects (the ABNJ Deep Seas Project, the Deep Seas Japan project, and the Horizon 2020 SponGES project)[1].

74. Historically in the CECAF region, there are no well-developed deep-sea fisheries in the ABNJ, but some countries have reported catches for deep-sea species in some of the CECAF Statistical Areas. Given that CECAF's mandate includes the ABNJ, this topic was introduced for discussion at the seventh session of the SSC to stimulate discussions

[1] Sustainable fisheries management and biodiversity conservation of deep-sea ecosystems in the areas beyond national jurisdiction (FAO-GEF ABNJ project); Fisheries management and marine conservation within a changing ecosystem context (FAO-Deep-Sea Japan project); Deep-sea Sponge Grounds Ecosystems of the North Atlantic: an integrated approach towards their preservation and sustainable exploitation of Atlantic marine ecosystems (Horizon 2020 SponGES project).

and exchange of information on recent developments in deep-sea fisheries and biodiversity conservation in the CECAF area including in the ABNJ and to discuss relevant information and research in support of conservation measures to protect VMEs.

75. Following a request from the seventh session of the SSC, an FAO *Technical Workshop on Deep-sea Fisheries and Vulnerable Marine Ecosystems of the Eastern Central Atlantic* took place in Dakar, Senegal, from 8 to 10 November 2016. The workshop was organized into two main parts, one part addressing deep-sea fisheries and VMEs in the CECAF area, and another part specifically dedicated to awareness raising on sponges, as part of the EC-funded Horizon 2020 SponGES project.

76. With regards to ongoing activities, FAO described the VME Portal and database and informed the SSC that the technical paper on VME processes and practices has been published and contains a chapter on the CECAF area. Two training opportunities on deep-sea benthic fauna were highlighted. Finally, the CECAF chapter of the *Worldwide Review of Bottom Fisheries in the High seas*, Volume II was shared with the SSC, and the members were asked to provide feedback within the next month.

77. The SSC was reminded of the recommendation of the 21st session of the Committee to adopt the VME closure of the overlapping area between CECAF and the South East Atlantic Fisheries Organisation (SEAFO).

PROGRAMME OF WORK IN THE REGION – WORKING GROUPS AND ACTIVITIES

78. Noting the progress made in the assessment of several stocks and at the same time the documented recurrent constraints, in particular in relation to data issues that requires immediate or medium-term corrective action, the SSC strongly recommends that the Working Groups should focus on a certain number of issues related to: (i) further development of scientific knowledge; (ii) development and improvement of assessment methods and tools, including direct assessment methods; (iii) strengthening of the statistical and biological sampling systems in all of the countries of the CECAF region, including for small scale fisheries; and (iv) communication of scientific advice to managers.

79. CECAF should seek opportunities for capacity development in relation to the above and the development of good practice frameworks as well as for the implementation of the workplan for the artisanal fisheries working groups, including in collaboration with partner projects and Programmes.

80. The SSC approved the Working Groups session proposed for the next intersessional period as follows:
    - The **Small Pelagics Working Group sub-group North** is expected to meet in May/June 2019 in Morocco.
    - A meeting of the **Demersal Working Group sub-group North** is proposed for the second or third quarter 2019 in Mauritania, pending confirmation of funding.
    - The **Demersal Working Group sub-group South** meeting is planned for the fourth quarter 2019 in Cabo Verde, pending funding.

- The **Small Pelagics Working Group sub-group South** is planned for the fourth quarter of 2019 or in 2020 in Cote d'Ivoire, pending funding.
- The **Artisanal Fisheries Working Group** is planned for the third quarter of 2019 in RDC, pending funding.

81. The SSC recommends that agreed procedures for the transmission of data to the next Working Group should be respected. The national appointed members should ensure that the data and working documents are sent to the leaders for each species group/stock, the chairperson of the Working Group and the FAO, within the agreed timeframe. The TORs of the chairs of the Working Group is available in Appendix F of the SSC report, and the newly agreed TORs for Working Group members will be shared with SSC members.

82. To ensure sustainability of the Working Groups, the SSC recommends that the Committee considers adopting a similar financing arrangement as with the Small Pelagic North Working Group, for the other Working Groups. This would facilitate planning and ensure that regular meetings are organised.

83. The SSC also approved the suggested workplan for the Artisanal Working Group and the request by the 21st session to the SSC to for a revised format of scientific advice and the management recommendations and for a report on current research capacities in the CECAF area related to the areas of work of CECAF.

84. The full report of the eighth session of the SSC can be found in the Information Documents.

85. The CECAF Secretariat informed the SSC of the status of development of the CECAF webpage, hosted by FAO.

86. Mr Carlos Alberto Monteiro (Cabo Verde) was elected as Chair of the SSC, and Mr Emmanuele Dovlo (Ghana) was elected as Vice-Chair. The ninth session of the SSC will take place in Nouadhibou, Mauritania. The final SSC report of the eighth session was adopted on 26 October 2018.

ACTIONS REQUESTED FROM THE COMMITTEE

87. The Committee is asked to consider to review and endorse the report of the SSC in relation to:

    a. Status of stocks and resulting management recommendations as well as priority areas for research, as presented in the eighth SSC report;
    b. Suggested workplan for the interim session and any related recommendations in relation to CECAFs working groups and its reporting;
    c. Recommendations related to the other areas of work discussed at the 8th session: CECAF catch statistics, FIRMS, VMEs, CECAF webpage, advice framework and relationships with other organizations and initiatives; and
    d. Take note of the activities of the different regional organizations, national institutions and projects in the CECAF region, and the new and upcoming projects and initiatives.

APPENDIX D OF THE REPORT OF THE SCIENTIFIC SUB-COMMITTEE

Summaries of the assessments and management recommendations for each stock

Table 1: Management recommendations summary sheet - Small pelagics - CECAF North

Stock	Last year– 2017– catch in 1 000 tonnes (2013–2017 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Sardine *S. pilchardus* Zone A+B	484 (444)	139%	56%	Non-fully exploited	The stock is considered non-fully exploited. The projections show that the stock could support an increase in catches. However, considering the instability of this resource vis-a-vis environmental changes call for the adoption of a precautionary approach requiring setting a catch limit for sardine in this zone at the same level as for 2016 and 2017 (550 000 tonnes).
Sardine ** *S. pilchardus* Zone C	699 (504)	147%	46%	Non fully exploited	The stock is influenced by environmental factors and shows fluctuations independent of fishing. Considering the observed fluctuations, total catch should be adjusted according to observed natural changes in the stock. The stock structure and abundance should be closely monitored by fishery independent methods covering the complete distribution area.
Sardinella** *S. aurita* *S. maderensis* *Sardinella* spp. Whole subregion	398 (487) 212 (212) 609 (697)	- - -	- - -	Overexploited Unknown	Based on the different indicators available, the Working Group found *S. aurita* to be overexploited. The state of *S. maderensis* remains unknown. Given the multi-specific nature of these fisheries, and as a precaution the Working Group recommends reducing both the effort and catches for the two species all zones and fleet.
Horse mackerel *T. trachurus* *T. trecae* Whole subregion	112 (115) 235 (208)	74% 53%	142% 115%	Overexploited.	The two species *T. trecae* and *T. Trachurus* are overexploited, The Working Group recommends reducing both the effort and catches for the two species at the level of the different zones and fleets.
Chub mackerel *Scomber colias* Whole subregion	380 (350)	127% (Global model) 101% (XSA)	105% (Global model) 69 (XSA)	Fully exploited	The Working Group concluded, on the basis of the results of the dynamic production model and the analytical model, that the stock is fully exploited. In spite of the projection results obtained by the two models indicate different trends, the Working Group recommends as a precautionary approach to renew the recommendation made during last year (340 000 tonnes).
Anchovy *Engraulis encrasicolus* Northern Fishery	20 (25)*	N/A	84% (LCA-Y/R)	Fully exploited	The availability of this species is highly dependent on environmental factors and is fished opportunistically, thus the catches varies considerably from one year to another. Assessment was carried out on information from Zone North+A+B. In addition, the acoustic biomass in 2017 showed a sharp decrease compared to 2016 accompanied by a decrease in catches. Although there is a decrease in fishing mortality in 2017, the Working Group recommends that current effort should be reduced and on the long term be adjusted according to the natural fluctuations in this stock.

Table 1: Management recommendations summary sheet - Small pelagics - CECAF North

Stock	Last year– 2017– catch in 1 000 tonnes (2013–2017 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Bonga *Ethmalosa fimbriata* Whole sub-region	117 (92)**	N/A	145% (LCA-Y/R)	Overexploited	The Working Group considers that Bonga in the subregion remains overexploited. Despite the recommendation of 2017 to reduce the effort, the Working Group noted a very strong increase in catches and fishing effort in 2017 compared with 2016. The Working Group recommends that effort and catch be reduced relative to current levels, for bonga to regain a catch level that can ensure sustainability.

*All advice is based on the results of the production model, unless otherwise indicated.
**It is the average of last three years (2015-2017)

Table 2: Management recommendations summary sheet-Small pelagics - CECAF South

Stock	Last year–2017– catch in 1 000 tonnes (2013–2017 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Sardinella *S. aurita* **West** (Côte d'Ivoire, Ghana, Togo and Benin)	58 180 (40 565)	19%	564%	Overexploited	Current catch of *S. aurita* is not sustainable. Catch will have to be reduced to avoid future depletion of the stock. The Working Group recommends the fishery should be closed, also considering the R/V *Dr Fridtjof Nansen* survey results for the region from 2017.
Sardinella *S. aurita* **Central** (Nigeria)	7 473 (6 308)*	-	-	No assessment made as no data was available.	As a precautionary measure, do not exceed the average of the 3 last years (15 000 tonnes)*.
Sardinella *S. maderensis* **West** (Côte d'Ivoire, Ghana, Togo and Benin)	10 717 (10 929)	9%	787%	Overexploited	The Working Group considers the stock is in very bad condition, near collapse, and the fishery should be closed.
Sardinella *S. maderensis* **Central** (Nigeria)	15 115 (14 616)*	-	-	No assessment made as there was incomplete data for the region.	As a precautionary measure, do not exceed the average of the 3 last years (14 616 tonnes)*.
Sardinella *Sardinella* spp. **North** (Guinea-Bissau, Guinea, Sierra Leone and Liberia)	60 047 (54 325)	129%	49%	Not fully exploited	As a precautionary measure, do not exceed current fishing level for 2017 (60 000 tonnes).

Table 2: Management recommendations summary sheet-Small pelagics - CECAF South

Stock	Last year–2017– catch in 1 000 tonnes (2013–2017 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Sardinella *Sardinella* spp. **South** (Gabon, Congo, DR Congo and Angola)	22 724 (121 862)**	113%	155%	Fully exploited	As a precautionary approach, it is recommended not to exceed catch level of the average of the last 5 years (121 862)**
Bonga (*E. fimbriata*) **North** (Guinea)	53 757 (45 999)	-	-	No acceptable results from the models.	As a precautionary measure, do not increase catches from the average of the last 5 years (46 000 tonnes).
Bonga (*E. fimbriata*) **Central** (Nigeria)	26 505 (24 776)*	-	-	No assessment made because there was incomplete data.	As a precautionary measure, do not exceed the average of the 3 last years (25 000 tonnes).
Bonga (*E. fimbriata*) **West** (Côte d'Ivoire, Ghana, Togo and Benin)	226 (713)	-	-	No acceptable results from models.	As a precautionary measure, the catch limit should not exceed the average of the last 5 years (700 tonnes).
Bonga (*E. fimbriata*) **South** (Gabon, Congo, DR Congo)	3 370 (4 734)***	134%	18%	Not fully exploited.	As a precautionary measure and due to uncertainty in the data, do not increase catches of this species from the average of the last 5years (5 000 tonnes)***.
Anchovy (*E. encrasicolus*) **West** (Côte d'Ivoire, Ghana, Togo and Benin)	49 713 (24 722)	137%	49%	Not fully exploited	As a precautionary measure, catch levels should not exceed that of 2017 (50 000 tonnes).

Table 2: Management recommendations summary sheet-Small pelagics - CECAF South

Stock	Last year–2017– catch in 1 000 tonnes (2013–2017 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Anchovy (*E. encrasicolus*) **South** Congo	372 (489)	122%	26%	Not fully exploited	Because Angola did not provide catch data, as a precautionary measure the catch level should not exceed the catch limit recommendation from 2014 (800 tonnes).
Horse mackerel and other *Carangidae* *Trachurus trecae* **North** (Guinea Bissau, Guinea, and Liberia) (no catch for Sierra Leone)	31 487 (22 032)	75%	125%	Overexploited	As a precautionary measure, do not increase catches of this species above the 2014 level (13 000 tonnes), and reduce effort****
Horse mackerel and other *Carangidae* *Trachurus trecae* **West** (Côte d'Ivoire, Ghana, Togo, Benin)	5 401 (14 938)	-	-	No reliable results from the model because there was no reliable data.	As a precautionary measure, do not increase catches of this species from the average of the 5 last years (14 900 tonnes).
Horse mackerel and other *Carangidae* *Trachurus trecae* **South** (Gabon, Congo, DR Congo and Angola)	48 006 (64 095)****	78%	135%	Overexploited	Catch levels should decrease.

Table 2: Management recommendations summary sheet-Small pelagics - CECAF South

Stock	Last year–2017– catch in 1 000 tonnes (2013–2017 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Horse mackerel and other *Carangidae* *Decapterus* spp. **North** (Guinea Bissau, Guinea, Sierra Leone, and Liberia)	4 796 (6 070)	92%	95%	Fully exploited	As a precautionary measure, the catch levels should not increase more than the average of the last 5 years (6 000 tonnes).

*Data only available for Nigeria until 2015. Last year catch is from 2015, and the average is only three years from 2013-2015.
**Angola did not provide data for 2017
***The 5-year average from the 2014 report was based on uncertain data (hence the high average during that assessment). The catch data for 2013-2017 is more certain, even though the 5-year average is much lower.
****No catch data for 2017, so the 2016 catch is used. Average is only 4 years from 2013-2016.

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Table 3: Management recommendations summary sheet – Demersals - CECAF – North

Stock	Catch (1 000 t) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	**Management recommendations** *(A reduction in fishing mortality implies either: reduction in effort or introduction of a measure like the closed season)*
Hake *Merluccius merluccius* Morocco	5 381 (5 293)	88%	126%	Overexploited	It is recommended to reduce the current fishing mortality of coastal trawlers targeting juveniles in order to minimize the proportion of juveniles observed in the catches of the last years analyzed.
Hake *Merluccius* spp. (*M. polli* et *M. senegalensis*) Morocco, Mauritania, Senegal, Gambia The whole zone	16 972 (9 668)	115%	137%	Fully exploited, but the catch level for last year is not sustainable by the stock in the short term. This stock was also assessed by other models (Bayesian and C_{MSY} which give the same results as production models).	Given the relatively low level of effort targeting the black hakes and the importance of bycatches of these species in 2016 (7 076 tonnes), the Working Group recommends that the necessary measures be taken to reduce bycatches to the average level of the period 2014-2015 (3 300 tonnes).
Demersal fish *Arius* spp. Senegal and Gambia	8 703 (7 613)	-	-	Fully to overexploited (based on the CPUEs)	*Arius* spp: The available data would not make it possible to assess this stock; thus, as a precaution, the Working Group recommends not to exceed the fishing mortality level which would help to achieve a catch level corresponding to the average of the last few years (7 600 tonnes).
Pseudotolithus spp Senegal and Gambia	7 410 (7 231)	-	-	Not conclusive	*Pseudotolithus* spp: The assessment being inconclusive, as a precaution, the Working Group, recommends that the fishing mortality should not exceed the 2016 level.
Epineplehus aeneus Mauritania/Senegal/Gambia	6 263 (4 566)	85%	144%	Overexploited	*Epineplehus aenus*: Taking into account the assessment results, the Working Group recommends a reduction in current fishing mortality.
Pagrus caeruleostictus Mauritania, Senegal	11 715 (7 653)	116%	114%	Fully exploited	*Pagrus caer.:* Considering the assessment results, the Working Group recommends not to exceed the current fishing mortality.
Sparus aurata and *Pagrus auriga* Morocco	4 138 (5 204)	-	-	Overexploited (2013)	*Sparus aurata* et *Pagrus auriga*: The available data does not permit assessments of this stock; thus, as a precaution, the Working Group recommends not to exceed the current fishing mortality level.
Dentex macropthalmus Mauritania/Senegal/Gambia	4 398 (4 225)	160%	27%	Not fully exploited	*Dentex macropthalmus*: The Working Group underlines that this stock could support a small increase in fishing mortality.
Plectorhynchus mediterraneus Morocco	7 708 (7 014)	72%	170%	Overexploited	*Plectorhinchus mediterraneus:* Based on the assessment results for the stock, the Working Group recommends to reduce the fishing mortality.

Table 3: Management recommendations summary sheet – Demersals - CECAF – North

Stock	Catch (1 000 t) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	**Management recommendations** *(A reduction in fishing mortality implies either: reduction in effort or introduction of a measure like the closed season)*
Pagellus belottii Mauritania/Senegal/Gambia	9 456 (6 164)	113%	82%	Fully exploited	*Pagellus belottii:* As a precaution, the Working Group recommends not to exceed the current fishing mortality.
Pagellus acarne Morocco	1 598 (1 126)	-	-	Fully exploited (LCA)	*Pagellus acarne:* As a precaution, the Working Group recommends not to exceed the current fishing mortality.
Pagellus spp Morocco	2 694 (3 523)	-	-	No assessment	*Pagellus spp*:: The Working Group recommends not to exceed the 2016 fishing mortality.
Shrimps					
Parapenaeus longirostris Morocco	6 992 (6 917)	38%	199%	Overexploited	Morocco: Considering that the deep water rose shrimp is exploited by the same coastal trawler fleet which also targets the white hake, it is recommended to reduce fishing mortality compared with 2016 (like what was recommended for the white hake)
Parapenaeus longirostris					
Mauritania	350 (790)	-	-	Not fully exploited (2013 assessment)	Mauritania- Considering the exceptional low levels of fishing mortality during the period 2012-2016, the Working Group considers that an increase could be possible, up to the 2011 catch level, when the fishery was considered sustainable (Working Group, 2013).
Senegal/Gambia	1 401 (1 918)	56%	85%	Overexploited in terms of biomass but not in terms of Fishing Mortality	Senegal: Considering that the stock is overexploited in terms of biomass and the fishing mortality below the target fishing mortality $F_{0.1}$, the Working Group recommends not to increase the current 2016 fishing mortality
Penaeus notialis					
Mauritania	343 (314)			Fully exploited (2013, assessment)	Mauritania: Considering the exceptional low level of fishing mortality during the period 2012-2016, the Working Group considers it possible to increase the catch to the 2011 level, when the when the fishery was considered sustainable (Working Group, 2013).
Senegal and Gambia	981 (1076)			Overexploited (2013)	Senegal-Gambia: Given that the last assessment (2013) indicates a situation of overexploitation, the Working Group recommends not to increase the current fishing mortality (2016).

Table 3: Management recommendations summary sheet – Demersals - CECAF – North

Stock	Catch (1 000 t) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	**Management recommendations** *(A reduction in fishing mortality implies either: reduction in effort or introduction of a measure like the closed season)*
Cephalopods					Despite the reduction in fishing effort in Morocco and Mauritania in recent years and the improvement in abundance of the two stocks (Dahkla and Cape Blanc), the Working Group recommends: - A reduction in fishing effort for the Dakhla stock. - Not to exceed the 2016 fishing mortality of the Cape Blanc stock. - For Senegal-Gambia, as a precaution, the Working Group recommends not to exceed the current fishing mortality.
Octopus vulgaris					
Dakhla	37 918 (38 988)	66%	142%	Overexploited	
Cap Blanc	34 142 (29 109)	100%	114%	Fully exploited	
Senegal/Gambia	4 466 (4 151)	-	-	No assessment	
Sepia spp.					
Senegal and Gambia	2 280 (3 147)	-	-	-	Senegal-Gambia: As a precaution, the Working Group recommends not to exceed the current fishing mortality.
Daklha	25 464 (23 783)	33%	310%	Overexploited	Morocco: Reduction in fishing mortality of this species and limitation of catch to the 2011 level (18 000 tonnes).
Cape Blanc	1 790 (2 376)	151%	31%	Not fully exploited	Mauritania: A progressive increase in catch could be envisaged.
Loligo vulgaris					
Senegal and Gambia	148 (132)	N/A	N/A	No model fit	This species of high commercial value is taken as bycatch by fleets which target the octopus. The improvement observed should not occasion a non-regulated increase in fishing effort. The Working Group recommends: - A close monitoring of catch and effort applied to squid. - Maintaining fishing mortality at its current level (2016).
Dakhla	15 597 (9 311)			No model fit	
Cape Blanc	2 920 (2 417)	N/A	N/A	No model fit	
		N/A	N/A		

*All reference points relate to the results of the production model, unless otherwise indicated.**Assessment relates to 2016 as the data available did not allow for an assessment up to 2017

Table 4: Management recommendations summary sheet – Demersals - CECAF – South

Stock	Catch (tonnes) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Pseudotolithus elongatus Guinea , Guinea Bissau, Sierra Leone, Liberia (Data available only for Guinea-Bissau in the last three years)	77 (2 812)*	-	-	No results from the assessment model and no conclusion can be made based on available data	Considering the problems with the data, the Working Group is not in a position to make specific recommendations for effort and catch levels. As a precautionary measure, it is the expectation that more complete and reliable datasets are collected and available for all fisheries for the next meeting. The Working Group recommends not increasing the fishing effort.
Pseudotolithus spp. Guinea, Sierra Leone, and Liberia (Data available only for Liberia in the last three years)	1 899 (2 988)	-	-	No results from the assessment model and no conclusion can be made based on available data	As a precautionary measure, and in the expectation that more complete and reliable data are collected and available for the next meeting, the Working Group recommends that the total catch for this group of species do not exceed the total capture of the species for the last year (1 900 tonnes).
Galeoides decadactylus Guinea-Bissau	2 614 (2 390)	85%	130%	Overexploited	As a precaution and pending the collection and availability of more complete and reliable data sets for the next assessment, the Working Group recommends a reduction in fishing effort. But the Working Group cannot comment on the level of catches due to the lack of data from small-scale fisheries. For industrial fishing, the Working Group recommends not to exceed the average level of 2010-2013 (3 000 tonnes).
Arius spp. Guinea, Guinea-Bissau	12 232 (7 179)	-	-	No results from the assessment model	As a precautionary measure, the Working Group recommends not to increase fishing effort, as a series of more complete and better-quality data are not available. Since the estimated catches in 2016 exceed the average catches of the last five years by 34 percent, the Working Group recommends the reinforced monitoring of this stock and a gradual reduction in catches.
Pomadasys spp. Guinea Bissau	2 224 (1 266)	81%	181%	Overexploited	As a precaution and pending of more complete and reliable data series being collected and available for all fisheries for the next meeting, the Working Group recommended a reduction in effort. The Working Group cannot recommend any catch level due to the lack of data from artisanal fisheries. For industrial fishing the Working Group recommends not to exceed the average level of catch for the last 5 years (1 300 tonnes).
Cynoglossus spp. Guinea, Sierra Leone and Liberia	1 055 (2 514)	-	-	The Working Group did not perform an assessment because the data available were incomplete.	Due to the lack of data for the recent period, the Working Group is not in a position to make specific recommendations on the level of capture and effort for this group of species. Countries should make arrangements for complete and up-to-date data series to be available for the next assessment Working Group.

Table 4: Management recommendations summary sheet – Demersals - CECAF – South

Stock	Catch (tonnes) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Dentex spp.´ Guinea-Bissau Guinea, Sierra Leone, Liberia	Not available	-	-	No assessment	Due to the lack of data for the recent period, the Working Group is not in a position to make specific recommendations on the level of capture and effort for this group of species. Countries should make arrangements for complete and up-to-date data series to be available for the next assessment Working Group.
Cephalopholis taeniops Cape Verde (data until 2015)	197 (251)***	-	-	No results from the assessment model	As a precautionary measure the Working Group recommends that the fishing effort should not exceed the current level and that total catch should not exceed the level of 2015 (200 tonnes)
Muraenidae Cape Verde (data until 2015)	119 (142)***	103%	79%	Fully exploited	The WG recommends that the fishing effort should not exceed the current level and that total catch should not exceed the average of the last five years (140 tonnes)
Pseudopeneus prayensis Cape Verd (data until 2015)	79 (65)***	-	-	No results from the assessment model	As a precautionary measure the Working Group recommends that the fishing effort should not exceed the current level and that total catch should not exceed the average of the 5 last years (60 tonnes)
Seriola spp. Cape Verde	92 (95)	-	-	No results from the assessment model, but CPUE shows a general decreasing trend	As a precautionary measure the Working Group recommends that the fishing effort should not exceed the current level and that total catch should not exceed the average of the 3 last years (90 tonnes)
Diplodus spp. Cape Verde	37 (31)	-	-	No results from the assessment model, but CPUE shows a general decreasing trend	As a precautionary measure the Working Group recommends that the fishing effort should not exceed the current level and that total catch should not exceed the average of the 3 last years (35 tonnes)
Brachydeuterus auritus Côte d'Ivoire, Ghana, Togo and Benin	20 225 (14 183)	28%	396%	Overexploited	As a precautionary measure the Working Group recommends a reduction in fishing effort in order not to exceed the average catch of the last five years (14 183 tonnes)
Galeoides decadactylus Côte d'Ivoire, Ghana, Togo and Benin	5 058 (4 632)	-	-	Overexploited	Given that this species was considered overfished in 2011 and the analysis of the different available CPUE shows different trends the Working Group recommends that the catch does not exceed the average of the last 5 years (4 600 tonnes)
Dentex spp. Côte d'Ivoire, Ghana, Togo and Benin	5 704 (4 978)	-	-	The Data available are not suitable to fit the models	As a precautionary measure, taking into account that this species was considered overexploited in 2008 and 2011, the Working Group recommends that the catch of this species should not exceed the average of the last five years, ie 5 000 tonnes.
Pagellus bellottii Côte d'Ivoire, Ghana, Togo and Benin	5 488 (5 400)	136%	50%	Not fully exploited	Taking into account the results obtained in the assessments models and analysis of the CPUE trends, the Working Group recommends that the catch can be maintained at current levels (6 000 tonnes)

Table 4: Management recommendations summary sheet – Demersals - CECAF – South

Stock	Catch (tonnes) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Pseudotolithus spp. Côte d'Ivoire, Ghana, Togo and Benin	2 831 (2 621)	135%	70%	Fully exploited	The Working Group recommends not to increase the fishing effort and that the catch does not exceed the average of the last 5 years (2 600 tonnes)
Pseudotolithus spp. Nigeria and Cameroon	15 947 (15 506)	94%	105%	Fully exploited	The Working Group recommends not to increase the fishing effort of 2016. The total catch should not exceed the last year catch of 16 000 tonnes
Galeoides decadactylus Nigéria, Cameroon S. Tome and Guinea Equatorial	6 535 (6 727)	-	-	No results for the assessment model. But, based on other information available the Working Group considerer that the stock is fully exploited.	As a precautionary measure the Working Group recommends that the total catch should not exceed the mean catch of the last five years (7 000 tonnes)
Cynoglossus spp. Nigeria, Cameroon and Equatorial Guinea	11 802 (11 997)	-	-	No results for the assessment model. But, based on other information available the Working Group considerer that the stock is fully exploited.	As a precautionary measure the Working Group recommends that the total catch should not exceed the mean catch of the last five years (11 000 tonnes)
Dentex spp. S Tome & Principe and Equatorial Guinea	110 (247)	-	-	No reliable data for assessment.	As a precautionary measure the Working Group recommends not increase the mean catch of the last five years (250 tonnes)
Pagellus spp. Equatorial Guinea Sao Tome & Principe	82 (134)	-	-	No reliable data for assessment.	The Working Group is not in position to give any recommendation in relation to catch or effort level for *Pagellus* spp.
Brachydeuterus auritus Nigeria	2 764 (2 798)	85%	92%	Fully exploited	The Working Group recommend not to increase the fishing effort of 2016. The total catch ashould not exceed the last year catch of 3 000 tonnes
Arius spp Nigeria and Cameroon	21 167 (21 483)	-	-	No reliable results for the assessment model based on other information available. Based on CPUEs the Working Group considers the stock Fully Exploited	The Working Group recommends not to increase the fishing effort of 2016. The total catch should not exceed the average catch of the last 5 years (22 000 tonnes)
Pomadasys spp. Nigeria and São Tome &Princioe	7 280 (7 635)	-	-	No reliable results	As a precautionary measure the WG recommends not increase the mean catch of the last five years (7 700 tonnes)
Pseudotolithus spp. Angola, Congo and Gabon	17 152 (16 396)	-	-	Model provides unsatisfactory adjustment and assessments are rejected	As a precautionary measure and given that this group of species was considered over-exploited in the last assessment (2011) the Working Group recommends that the catch of this group of species should not exceed the average of the last five years (17 000 tonnes)

Table 4: Management recommendations summary sheet – Demersals - CECAF – South

Stock	Catch (tonnes) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Galeoides decadactylus Angola, Congo and Gabon	5 850 (4 627)	66%	139%	Overexploited	The Working Group reiterated the 2011 recommendation to reduce fishing effort and not to exceed the average of the total catch of the last five years, ie 5000 tonnes.
Cynoglossus spp. Angola, Congo and Gabon	1 948 (2 001)	88%	142%	Fully exploited	Fishing mortality needs to be reduce to avoid the overexploitation of the stock.The Working Group recommends that the catch should not exceed the mean level of the last five years (1 900 tonnes).
Dentex spp. Angola, Congo and Gabon (No data from Angola since 2007)	657 (589)	-	-	The model provides an unsatisfactory fit.	The Working Group recommends a reduction in effort
Dentex macrophthalmus Angola	11 146 (12 450)	-	-	The results provide by the model was not acceptable, because of the poor quality data reported, which are not consistent.	The Working Group recommends not increasing the fishing effort for the stock and the total catches should not exceed the last year catches (11 000 tonnes).
Brachydeuterus auritus Congo and Angola	6 872 (6 182)	-	-	The fitting of the model is not satisfactory due to quality of the data	The Working Group is unable to make recommendations regarding catch and effort levels for this species. This is of concern because the last assessment in 2011 showed that this species was overexploited.
Pomadasys spp. Gabon, Congo and Angola	1 696 (2 642)	-	-	The fit of the model to the data in all the tests were inconclusive	The Working Group is unable to make recommendations regarding catch and effort levels for this species. The previous results of the Working Group indicate that the stock of *Pomadasys* spp. in Gabon, Congo and Angola was overexploited.
Arius spp. Gabon and Congo	260 (526)	147%	35%	Non-fully exploited	As a precautionary and tempting measure, given that the previous Working Groups had concluded overexploited, the Group will reiterate the recommendation of previous groups not to exceed a catch level of 500 tonnes.
Merluccius polli Angola	12 180 (11 749)	-	-	The model doesn't fit because the data was showing too many inconsistencies.	Considering the results of last assessment in 2011, the stock was fully exploited. The Working Group recommends that fishing mortality should not be increased and the stock should be well monitored.
Pentanemus quianquarius Congo and Gabon	655 (802)			The fit of the model to the data was inconclusive	As a precautionary measure, the Working Group recommends not to increase the effort and not to exceed the 2016 catch level of this species (700 tonnes).
Parapeneus longirostris Guinea -Bissau	673 (807)	124%	51%	Non-Fully Exploited	According to the assessments the Working Group considers the stock could sustain a controlled increase in catch adjusted to the level of the mean of the last five years (800 tonnes)

Table 4: Management recommendations summary sheet – Demersals - CECAF – South

Stock	Catch (tonnes) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Parapeneus longirostris Congo	501 (610)	52%	134%	Overexploited	According to the assessments, the Working Group considers the fishing mortality too high in 2016 and recommends a reduction in the catch level of 2016 less than 500 tonnes.
Parapeneus longirostris Angola	2 242 (1 655)	62%	255%	Overexploited	According to the assessments, the Working Group consider the fishing mortality too high in 2016 and recommends a reduction in the catch level below the TAC established for 2017 (1200 tonnes).
Penaeus notialis Guinea Bissau	383 (502)	-	-	No results for the assessment model based on other information available the Working Group considerer that the stock is fully exploited.	The Working Group recommends that the catch should not exceed the mean catch of the last five years, (500 tonnes)
Penaeus notalis Sierra Leone	(6)	-	-	No assessment, as there is no information on Catch and CPUE the Working Group was not able to conduct any assessment	No recommendation
Penaeus notialis Ghana	660 (2 780)*	-	-	No new assessment due to lack of reliability of information.	Given the uncertainty in the data and as a precautionary measure the Working Group recommends not to increase catches above the 2016 level (700 tonnes) before more consistent data can be provided.
Penaeus notialis Gabon	256 (257)	143%	34%	Non Fully Exploited	According to the assessments the Working Group considers the stock could sustain a controlled increase in catch adjusted gradually to the effort level recommended in the National shrimp management plan
Penaeus notialis Nigeria	878 (908)	-	-	The fit of the model to the data is not acceptable and therefore, no conclusions can be made based on the model results.	Total industrial catch and CPUE follow the same trend during the period considered, this revealing inconsistencies in the data provided. Efforts on the separation of coastal shrimp's species and effort estimation should be continued to solve this inconsistencies in next Working Group. No management recommendation.
Penaeus notialis Congo	297 (274)	72%	167%	Overexploited	According to the assessments the Working Group recommends to decrease the effort to catch level recommended last 2011 Working Group (200 tonnes)
Coastal shrimps Guinea (data until 2013)	? (267)	-	-	No new assessment due to lack of information.	The shrimps fishery is closed since 2016
Coastal shrimps Benin	0.52 (13)	-	-	No new assessment due to lack of reliable information.	The Working Group was not in a position to provide specific management advice.
Coastal shrimps Nigeria	4 851 (4 928)	-	-	The fit of the model was not reliable.	The Wg was not in a position to provide specific management advice.

Table 4: Management recommendations summary sheet – Demersals - CECAF – South

Stock	Catch (tonnes) 2016 (2012–2016 avg.)	*$B_{cur}/B_{0.1}$	*$F_{cur}/F_{0.1}$	Assessment	Management recommendations
Coastal shrimps Cameroon	325 (318)	78%	129%	The fit of the model was good and the Working Group consider that the stock is in the limit of full exploited although keeping the current F level will bring the stock to overexploitation	According to the assessments the Working Group recommends to decrease slightly the effort to the mean level of 5 last years (300 tonnes)
Palinurus charlestoni Cape Verde (data until 2015)	5*(15)	-	-	The fit of the model is not good and the Working G rejected the assessment but the stock is overexploited according with the information provided	The WG recommend to keep the fisheries closed until new signs of recovering of the stocks
Sepia spp. Ghana	2 777 (1 898)	116%	14%	The results of the model obtained are satisfactory. They indicate that the stock of Sepia spp. is not-fully exploited	The Working Group recommends that the current fishing effort can be gradually increased to a level that brings the production of the stock to the reference levels
Sepia spp. Guinea Bissau	2 929 (2 131)	126%	91%	The fit of the model was reasonably good and the Working Group considered that the stock is fully exploited.	As a precautionary measure the fishing effort should not exceed the 2016 effort, and the catch should not exceed the average of the last 5 years (2 000 tonnes).
Sepia spp. Guinea* (data available until 2013)	4 721* (5 786)*	-	-	The fit of the model was satisfactory for 2013 with data available.	No specific recommendation could be made by the Working Group because the data was until 2013.
Octopus vulgaris Guinea-Bissau	2 520 (3 847)	-	-	The model did not fit the data available	As a precautionary measure the Working Group recommends that the catch should not exceed the mean catch of the last five years (3000 tonnes)