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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

Scientific Sub-Committee

Seventh Session

Tenerife, Spain, 14–16 October 2015

STATUS SUMMARY FOR DEMERSAL STOCKS IN THE SOUTHERN AREA OF THE EASTERN CENTRAL ATLANTIC- CECAF

SUMMARY

The third meeting of the FAO/CECAF Working Group on the Assessment of Demersal Resources, Subgroup South met in Accra, Ghana, from 15-24 November 2011 in the FAO Regional Office. The Group assessed the status of the demersal resources in Southwest Africa and advise on future effort and catch levels. The advices for the stocks are given in relation to the agreed reference points $F_{0.1}$, F_{MSY}, $B_{0.1}$. Six stocks could not be assessed using any of the models because the data available to the working group were not in the appropriate format and/or not sufficient to use in the assessment models. Catch and effort data were incomplete for the latter years in several of the data series. The working group also noted that catch and effort information from some countries in the region is no longer being collected.

The results of the assessments show that of the **fifty stocks analyzed**:

Nine stocks were found to be overexploited: *Pseudotolithus* spp. (Guinea Bissau and Guinea), *Pseudotolithus* spp. (Angola, Cogo, Republic Democratic Republic of Congo and Gabon), *Brachydeuterus auritus* (Côted'Ivoire, Ghana, Togo, Benin) *Brachydeuterus auritus* (Congo and Angola), *Galeoides decatacterus* (Côte d'Ivoire, Ghana, Togo, Benin), *Galeoides decatacterus* Congo+Angola), *Pagellus bellottii* (Côte d'Ivoire, Ghana, Togo and Benin), *Cynoglossos* spp. (Angola), Sepia spp. (Ghana).

Twelve stocks are fully exploited: *Pseudotolithus elongatus* (Guinea + Guinea Bissau), *Galeoides decatactylus* (Guinea +Guinea Bissau*), Pomadasys* spp (Guinea Bissau and Guinea), *Cephalopholis taeniops* (Cape Verde), *Muraenidae* (Cape Verde), *Pseudotolithus* spp. (Côte d'Ivoire, Ghana, Togo and Benin) *Pseudotolithus* spp. (Nigeria and Cameroon), *Merlluccius polli* (Angola), *Dentex macrophtalmus* (Angola), *Dentex* spp. (Congo, Gabon, Angola, Democratic Republic of Congo), *Parapenaeus longirostris* (Guinea Bissau) *Parapenaeus longirostris* (Congo) and *Penaeus notialis* (Congo).

Five stocks are non fully exploited: *Sparidae* (Guinea Bissau and Guinea), *Arius* spp. (Guinea Bissau and Guinea) *Cynoglossus* spp. (Guinea Bissau and Guinea), *Penaeus notialis* (Ghana), *Octopus vulgaris* (Guinea Bissau)

The working group thus 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 multi specific, an overall reduction in fishing effort is necessary. Since most of the stocks are shared by two or more countries in the region, the Working Group strongly recommends the strengthening of regional cooperation in research and management.

INTRODUCTION

1. The third meeting of the FAO/CECAF Working Group on the assessment of demersal resources, Sub-group South met in Accra, Ghana, from 15-24 November 2011 in the FAO Regional Office.
2. The overall objective of the Working Group is to assess the state of demersal resources in the Southern CECAF area and make recommendations on fisheries management and exploitation options aimed at ensuring optimal and sustainable use of the resources for the benefit of coastal countries.
3. Scientists from Angola, Benin, Cameroon, Cape Verde, Côte D'Ivoire, Democratic Republic of Congo, Congo, Gabon, Ghana, Guinea, Guinea Bissau, Guinea Equatorial, Sao Tome and Principe, Spain, Togo and FAO participated in this Working Group.
4. Separate sections have been devoted to each of the five groups: demersal fish South 1, demersal fish South 2, demersal fish South 3, demersal fish South 4, shrimps South and cephalopods South. A total of around 50 stocks were analyzed.
5. The working area for the Working Group is defined as the waters between the southern border of Senegal and southern border of Angola, including Cape Verde and S. Tome and Principe Iles.

Methods

6. 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. For some stocks, a Length Cohort Analysis was applied in order to estimate the current F-level and the relative exploitation pattern on the fishery over the last few years. A length-based Yield per Recruit Analysis was then run on these estimates, to estimate the Biological Reference Points

The three assessment categories adopted by the CECAF scientific working groups include:

- **Non-fully exploited:** 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.

Management advice

7. The advices for the stocks are given in relation to the agreed reference points(FAO, 2006):

    - **Target Reference Points:** $F_{0.1}$ and $B_{0.1}$.
    - **Limit Reference points:** B_{MSY} and F_{MSY},

Results

8. The results of the assessments show that of the fifty stocks analyzed nine stocks were found to be overexploited whereas thirteen were found to be fully exploited or not fully exploited (Table 2).

Management Recommendations

9. 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 multispecific, an overall reduction in fishing effort is necessary. There was uncertainty in the assessments carried out, mostly due to deficiencies in some of the data available.

Conclusions

10. Since most of the stocks are shared by two or more countries in the region, the Working Group strongly recommends the strengthening of regional cooperation in research and management. The members of the Working Group should discuss with fisheries managers of their countries their expectations in relation to management advice from scientists and develop strategies to improve the advice provided.

OVERALL REGIONAL TRENDS

Catch

11. The total catch of demersal resources analysed in 2011 Working Group was around 265 000 tonnes in 2009. The catch in 2010 is around 169 000 tonnes, but most of the countries provided statistics until 2009 (Table 1, Figure 1).

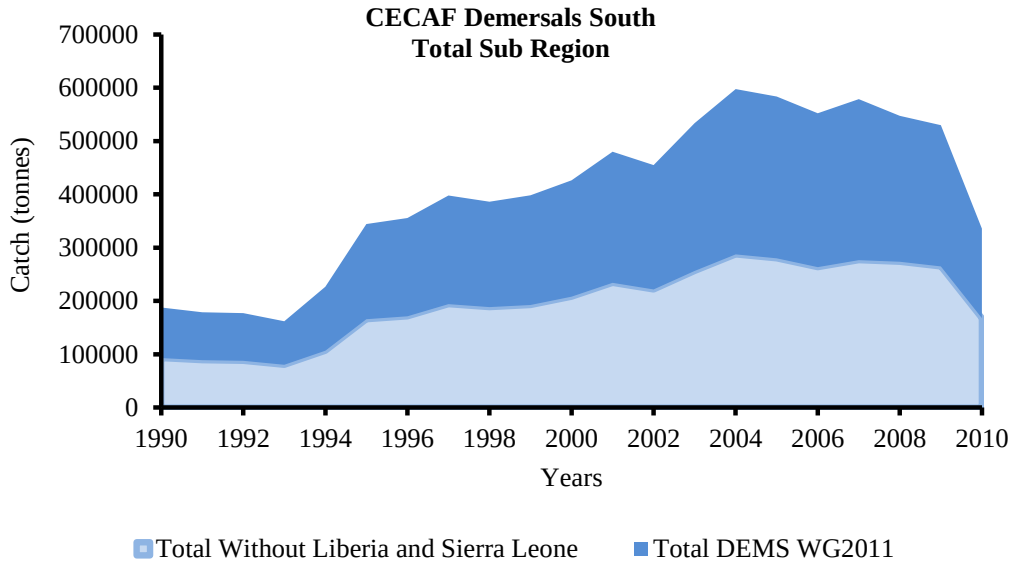

Figure. 1. Total Catch of Demersal South studied by the DEMS WG

12. Total catches of these resources for the period 1990–2010 fluctuated with an average around 206 000 t. A decreasing trend has been seen since 2004 (Figure 1). The average catches of demersal fish analyzed over the last five years (2006-2010) have been estimated at around 252 000 t.

13. The most important group of species, in terms of catches, studied in the region is *Pseudotolithus* spp. (croakers) of the *Sciaenidae* family which makes up on average around 59 000 t in the period 2006–2010 with a contribution to the total catches of the main demersal fish studied in the region of about 19 percent in 2010. The second most important species studied in the Working Group in 2011 is the group *Arius* spp. (catfish) (11 percent in 2010) which is widely distributed in the West African zone representing an average of around 31 000 t in the period 2006–2010 (Figure 2). Also important is the *Brachydeuterus auritus* (bigeye grunt) (12 percent in 2010) and contributed with an average of around 28 000 t in the same period (2006-2010).

Table1. Total Catch of the main demersal species analysed in 2011 Demersal South WG

	Catch contribution 2009 (%)	Catch contribution 2010 (%)	2009 Catch	2010 Catch
Pseudotolithus spp.	23.7%	19.1%	61685	32374
Arius spp.	12.6%	11.2%	32857	19043
Brachydeuterus auritus	11.0%	11.9%	28613	20226
Galeoides decadactylus	7.9%	9.1%	20510	15390
D.Macrophthalmus	7.8%	10.5%	20217	17820
Pomadasys spp.	5.9%	6.7%	15239	11339
Cynoglossus spp.	5.1%	6.0%	13336	10217
Dentex spp.	4.9%	6.5%	12650	11079
Pseudotolithus elongatus	4.3%	0.0%	11233	
Sparidae	1.8%	0.0%	4765	
M.Polli	1.7%	2.8%	4393	4675
Pagellus bellottii	1.6%	2.6%	4257	4421
Pagellus spp.	0.3%	0.5%	664	845
P.quinquarius	0.2%	0.3%	436	540
Cephalopholis taeniops	0.1%	0.0%	248	
Muraenidae	0.1%	0.0%	148	
Cephalopholis taeniops	0.1%	0.0%	248	
Seriola spp.	0.0%	0.0%	119	
Pseudopeneus prayensis	0.0%	0.0%	33	
Diplodus spp.	0.0%	0.0%	27	
Total Fishes	**89.0%**	**87.3%**	**231676**	**147968**
Coastal shrimps	6.0%	9.2%	15601	15545
Parapenaeus longirostris	1.2%	1.5%	3018	2480
Penaeus notialis	0.2%	0.3%	563	485
Total Shrimps	**7.4%**	**10.9%**	**19183**	**18510**
Octopus vulgaris	2.4%	0.4%	6244	631
Sepia spp.	1.3%	1.4%	3344	2387
Total Cephalopods	**3.7%**	**1.8%**	**9588**	**3018**
TOTAL DEMERSALS	**100.0%**	**100.0%**	**260447**	**169496**

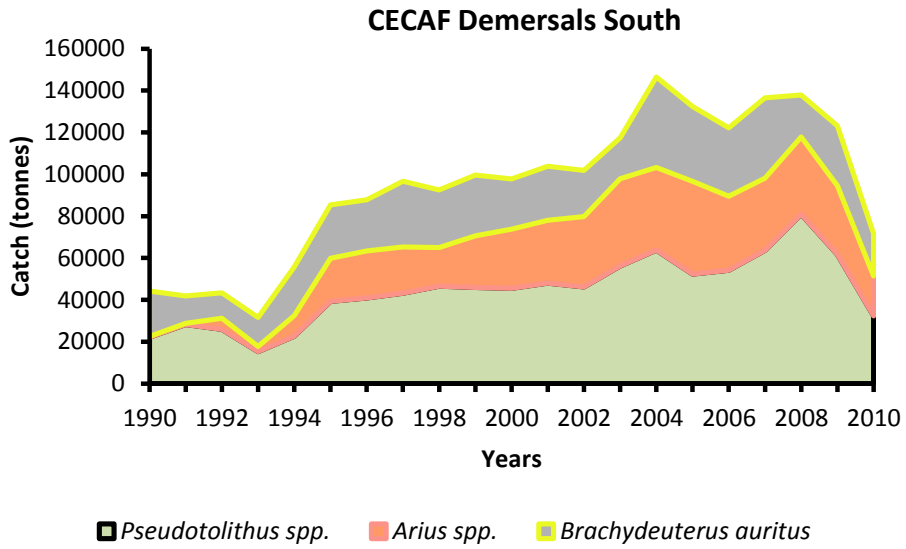

Figure 2. *Arius* spp., *Dentex* spp. and *Pseudotolithus* spp, Catch (1990-2010)

14. The deepwater rose shrimp (*Parapenaeus longirostris*) and the Southern pink shrimp (*Penaeus notialis*) are considered important in the region. The average catch over the period 2006–2010 of *Parapenaeus longirostris* is estimated at 2 500 t and that of *Penaeus notialis* at around 1 800 t (Figure 1). The non identified coastal shrimps from Benin, Cameroon, Democratic Republic of Congo and Nigeria yields important catches in these countries with a catch average of 15 000 t in the period (2006–2010) (Figure3).

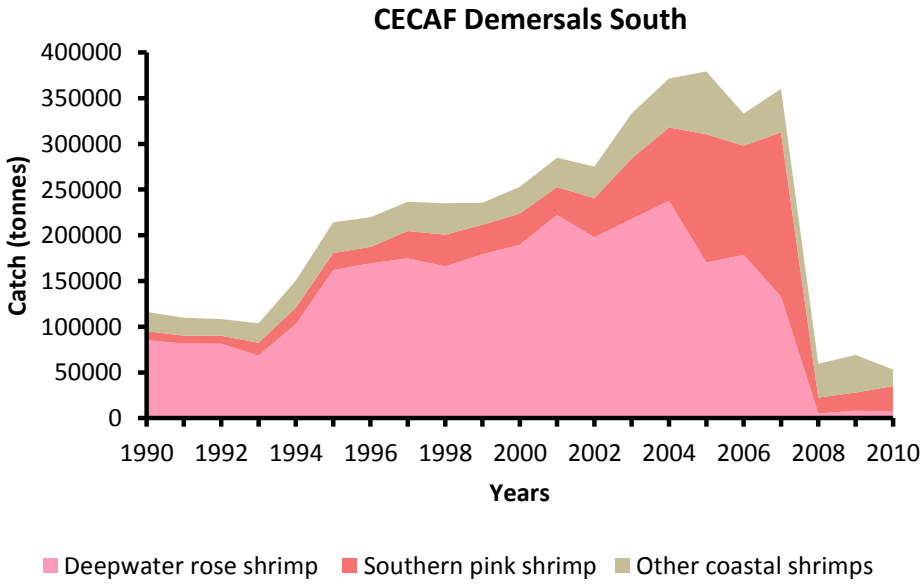

Figure 3 Catches of shrimps in CECAF South (1990-2010)

Surveys

Since the last meeting, 17 fisheries surveys were carried out in the southern CECAF area including 11 national surveys and 6 regional ones. The main objective of these surveys was the assessment of the stocks. Data collected included catches by species (in weight and number), biological and oceanographic data, plankton (phyto and zoo plankton) and benthos. The regional surveys were carried out by R/V DR FRIDTJOF NANSEN. Of the national surveys, some were carried out by R/V DR. FRIDTJOF NANSEN and other by research vessels from the region such as the Guinean vessel R/V LANSANA CONTÉ and the Senegalese R/V ITAF DEME.

Assessment results

15. A summary sheet with the complete results of the assessments and management recommendations is given in Table 2.

Nine stocks were found to be overexploited:

16. The Croakers *(Pseudotolithus* spp.) in Guinea-Bissau and Guinea is overexploited: The current biomass is 35 percent below the target biomass $B_{0.1}$. The current fishing mortality is 5 percent above the target fishing mortality $F_{0.1}$. Further, the current fishing mortality is 26 percent lower than that which would provide a sustainable yield at the current biomass (Figure 4).

17. The Croakers (*Pseudotolithus* spp.) in Gabon, Congo, Democratic Republic of Congo and Angola, is overexploited. The current biomass of the stock is 50 percent of the biomass which corresponds to the target reference point $B_{0.1}$. The fishing mortality of these demersal species remains high 89 percent higher than the target fishing mortality $F_{0.1}$, and 17 percent higher than the fishing mortality that would provide a sustainable yield at the current biomass F_{SYcurB} (Figure 5).

18. The *Red Pandora (Pagellus bellottii)* in Côte d'Ivoire, Ghana, Togo and Benin is overexploited in terms of biomass, the current biomass is 54% below the target biomass $B_{0.1}$ and the fishing mortality is 58% higher than the target fishing mortality $F_{0.1}$ (Figure 6).

19. The Bigeye grunt *(Brachydeuterus auritus)* stock in Côte d'Ivoire, Ghana, Togo and Benin is overexploited. Current biomass of the stock is 41 percent of that producing the maximum sustainable yield B_{MSY} and 37 percent of that corresponding to the target reference point, $B_{0.1}$. The current fishing mortality exceeds by 136 percent that needed to bring the stock to the biomass level of $B_{0.1}$, also the current fishing mortality is 33 percent higher than the fishing mortality that would keep the current biomass level (Figure 7).

20. The Bigeye grunt *(Brachydeuterus auritus)* in Congo and Angola, is overexploited in terms of biomass, the current biomass is 58% below the target biomass $B_{0.1}$ and in terms of current fishing mortality is superior than the target fishing mortality $F_{0.1}$. Further, the current fishing mortality is 81% higher than that which would provide a sustainable yield at the current biomass (Figure 8).

21. Lesser African threadfin (*Galeoides decatacterus*) in Côte d'Ivoire, Ghana, Togo and Benin stock, is overexploited the current biomass is about half of the biomass of the target reference point $B_{0.1}$. Fishing mortality is 58 percent higher than that

corresponding to $B_{0.1}$. Fcur is 2 percent lower than the mortality which would keep biomass at the current level (Figure 9).

22. Lesser African threadfin *(Galeoides decatacterus*) in Gabon, Congo and Angola stock is overexploited*,* the current biomass of the stock represents 51 percent of the current biomass corresponding to the target reference point $B_{0.1}$. The fishing mortality remains high, as last assessment in 2009, 96 percent higher than the target reference point $F_{0.1}$. (Figure 10).

23. Sole (*Cynoglossos* spp.) in Angola, is overexploited in terms of biomass, the current biomass is 43 percent below the target biomass $B_{0.1}$, the current fishing mortality is 91 percent higher than the target fishing mortality $F_{0.1}$. Further, the current fishing mortality is 37 percent higher than that which would provide a sustainable yield at the current biomass. (Figure 11).

24. Cuttlefish *(Sepia* spp.) in Ghana, is overexploited, the current biomass is only 36 percent of the target biomass $B_{0.1.}$ The fishing mortality is much higher (146 percent) than the fishing mortality corresponding to the target fishing mortality ($F_{0.1}$). Furthermore, the current fishing mortality is 38 percent higher than the fishing mortality that would keep the stock at its biomass level (F_{cur}/F_{SycurB}). (Figure 12)

Thirteen stocks were found fully exploited:

25. **Threadfin** *(Galeoides decadactylus)* in Guinea Bissau and Guinea; the current biomass is 31 percent above the target biomass $B_{0.1}$. The current fishing mortality is 36 percent below the target fishing mortality $F_{0.1}$, and the current fishing mortality is 4 percent above that which would give a sustainable yield at the current biomass level (Figure 13).

26. **Garoupa** *Cephalopholis taeniops* stock in Cape Verde, is fully exploited the current biomass the is 16 percent higher than that which corresponds to the target reference point $B_{0.1}$, but the current catch is 4 percent lower than the catch that would maintain the stock at its current biomass level (Figure 14).

27. *Pseudotolithus elongatus* (Guinea and Guinea Bissau), *Pomadasys* spp. (Guinea and Guinea Bissau), *Parapenaeus longirostris* (Guinea Bissau), *Pseudotolithus* spp. (Côte d'Ivoire, Ghana, Togo and Benin), *Muraenidae* (Cape Verde), *Pseudotolithus* spp. (Nigeria and Cameroon), *Dentex* spp. (Congo, Gabon, Angola and Republic Democratic of Congo), *Parapeneus longirostris* (Congo), *Penaeus notialis* (Congo); *Dentex macrophtalmus* (Angola) and *Merluccius polli* (Angola) (Table 2).

Five stocks are non- fully exploited:

28. *Octopus vulgaris* in Guinea-Bissau stock is not fully exploited, The current biomass is higher (36%) of the biomass target B0.1. The current effort is low, 19% of the fishing mortality corresponding to the production of the biomass target (F0.1) (Figure 15).

29. *Sparidae* (Guinea Bissau and Guinea), *Arius* spp. (Guinea Bissau and Guinea) *Cynoglossus* spp. (Guinea Bissau and Guinea), *Penaeus notialis* (Ghana),

30. No assessment was done for two stocks due to no data available to the Working Group (*Sepia* spp. in Guinea and *Parapeneus longirostris* in Angola) (Table 2).

31. In addition the model fit was rejected for nineteen stocks due to inconsistencies in the data (Table 2).

Management recommendations

32. The results of the assessments show that many of the stocks analyzed are fully to overexploited, and the Working Group thus 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 multi-specific, an overall reduction in fishing effort is necessary.

GENERAL CONCLUSIONS

33. For most of the stocks assessed, the only series of stock abundance indices available were commercial CPUE data series. Commercial CPUE series are not random sampling of the stocks and are affected by changes in fleet size and fishing strategy. Consequently changes observed in the CPUEs do not necessarily reflect the variations in stock abundance. Several of the series analyzed by the Working Group corresponded to fleets that have undergone significant changes in the period analyzed, including the entry of new categories of vessels, or marked changes in fishing strategy, which precluded their use in the analysis. This situation can be improved by more detailed analyses of the fleets and their catches. Therefore, the Working Group recommended that these analyses should be carried out, where sufficiently detailed data is available. Any changes in fishing strategy or in the fishing efficiency should be reported and taken into consideration in subsequent work.

34. There was uncertainty in the assessments carried out, mostly due to deficiencies in some of the data available. Although the amount of catch, effort and biological data available to the Working Group has increased in recent years, some deficiencies persist. The main deficiency remains reliable catch data for most of the demersal finfish stocks. Catch and effort data were sometimes incomplete for the last year 2010. This should be improved in future working groups. The uncertainty with regards to catch series includes, underreporting and misreporting of catches, uncertainty about discards etc. The Working Group also noted that catch and effort information from some countries in the region is no longer being collected. This is of serious concern as these basic data are required for the assessment of the stocks and the situation must be corrected in the future if the group is to be able to continue to provide useful fisheries management advice.

35. Since the assessments of the current states of the stocks and their exploitation depends strongly on the estimated levels of past and present catch, unreliable catch data will impact directly on the quality and reliability of the assessment and recommendations made by the group. Therefore these issues should be addressed with urgency and insistence. Biological sampling is almost non-existing in the region, which limits the analyses and models that can be applied by the working group.

36. In the absence of data on the size or age structure of the catch (length frequencies, individual length and weight, sex, maturity, etc.), the Working Group could not use

other models (no biological sampling information from catches was available from the fisheries). An adequate sampling programme to improve the knowledge of the stocks and fisheries covered by the Working Group needs to be initiated.

37. No regional demersal surveys have been carried out in the sub-region over the last few years, but national surveys have been carried out in some countries such as Angola and Guinea. Surveys are important sources of fishery independent information and some of the stocks several stocks were analyzed using survey data as the index of abundance. The Working Group encouraged further analysis and continuation of these data series by the different research vessels in the region.

38. Finally, since most of the stocks are shared by two or more countries in the region, the Working Group strongly recommends the reinforcement of regional cooperation in research and management. The members of the Working Group should discuss with fisheries managers of their countries their expectations in relation to management advice from scientists and develop strategies to improve the advice provided.

FUTURE RESEARCH

39. Several recommendations were made by the 2003, 2005 and 2008 sessions of the Working Group with respect to research to be pursued. The Working Group noted that work has been started to improve the statistical and biological sampling systems in the countries of the sub-region. Studies on biological aspects of certain species analyzed within the framework of the Working Group had also been initiated. Some recommendations, for various reasons, were not taken into consideration. Biological information is almost inexistent and sampling for biological purposes is not carried out on a regular basis in the sub-region. For most recommendations follow up activities had been initiated, although many of them require continuation to be useful for the assessments (see Table 1)

40. Some of the main recommendations on areas of work that require attention are summarised below:

- All data for the next Working Group must be prepared and sent to the chairman of each species group and FAO by the national focal points at the latest one week before starting the first part of the next meeting.
- Intensify sampling for length frequencies and species composition of catches including bycatch in all the main fisheries and present to the next Working Group meeting. Priority should be given to the main species, so as to obtain a complete catalogue of the basic biological parameters.
- Continue developing CPUE series from surveys and commercial fisheries. Continue to improve sampling by increasing the number of samples and

sample size of each sample covering all size ranges. All fleet segments and all quarters of the year. Each country and subgroup must ensure that length composition of the catch and surveys is organized in a way exploitable by the Working Group before the next meeting.

- Scientific surveys should be continued and abundance indices independent of the commercial fisheries should be integrated into the assessment models.
- Continue the collection of data from the artisanal fishery including effort and catch by species and gear.
- Collect and analyze data on the bycatch of the shrimp trawlers.

Table 2 – Assessments summary sheet WG Nov. 2011 – CECAF SOUTH (Cap Verde, Guinea Bissau, Guinea, Côte d'Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon, Equatorial Guinea, Sao Tome & Principe, Gabon, Congo, Democratic Republic of Congo and Angola).

Unit/stock	$C_{last\ year}$[1] (tonnes)	B_{cur}/B_{MSY} (%)	Bcur/B0.1	F_{cur}/Fsy cur (%)	F_{cur}/FMSY	Fcur/F0.1	Status	Management recommendations
Demersal Fishes 1								
Pseudotolithus elongates (Guinea + Guinea Bissau)	11233*	84%	76%	94%	109%	121%	Fully exploited	The fishing effort should not exceed the current level and that total catch should be above the average of the last three years (9 000 tonnes).
***Pseudotolithus* spp. (Guinea + Guinea Bissau)**	**7005***	**72%**	**65%**	**74%**	**95%**	**105%**	**Overexploited**	**Reduction in the fishing effort compared with the 2009 level and that the total catch should not exceed the 2009 catch (7 000) tonnes.**
Galeoides decadactylus (Guinea + Guinea Bissau)	5265*	114%	131%	104%	58%	64%	Fully exploited	Not to exceed the 2009 fishing effort and that the total catch should not be greater than the average of the last three years (5 000 tonnes).
Pomadasys spp. (Guinea + Guinea Bissau)	3050*	97%	88%	72%	74%	82%	Fully exploited	Not to increase total effort above the 2009 level. Total catch should not exceed the average of the catches from 2007-2009 (3000 tonnes per year).
Arius spp. (Guinea + Guinea Bissau)	11467*	151%	137%	79%	39%	44%	Non- fully exploited	As a precautionary measure, s not to increase fishing effort as a series of more complete and better quality data are not available. The catch should not exceed the 2009 level (5 000 tonnes)
Cynoglossus spp. (Guinea + Guinea Bissau)	5168**	154%	140%	81%	37%	41%	Non- fully exploited	As a precautionary measure not to increase fishing effort for. as a series of more complete and better quality data are not available. The catch should not exceed the 2008 level (5 000 tonnes).
Sparidae Guinea + Guinea Bissau	4613**	103%	93%	53%	52%	58%	Non- fully exploited	As a precautionary measure, the Working Group recommends that the fishing effort should be closely monitored.

[1] 'Last year' – 2010, if no other explicit remarks.* 2009. **2008

Unit/stock	$C_{last\ year}$[1] (tonnes)	B_{cur}/B_{MSY} (%)	Bcur/B0.1	F_{cur}/Fsy cur (%)	F_{cur}/FMSY	Fcur/F0.1	Status	Management recommendations
Cephalopholis taeniops (Cape Verde)	248*	128%	116%	96%	69%	77%	Fully exploited	As a precautionary approach fishing effort should not exceed the current level and that total catch should not exceed the average of the last three years (240 tonnes)
Muraenidae (Cape Verde)	148*	131%	119%	106%	74%	82%	Fully exploited	As a precautionary approach, fishing effort should not exceed the current level and that total catch should not be greater than the average of the last three years (140 tonnes).
Pseudopeneus prayensis (Cape Verde)	33*	130%	118%	97%	67%	75%	Fully exploited	As a precautionary approach the Working Group recommends an analysis of the data on the abundance index series (CPUE) and that new analysis models should be tried.
Seriola spp. Cape Verde	119*	-	-	-	-	-	No results from assessment	The Working Group decided to adopt a precautionary approach, and recommends an analysis of the data on the abundance index series (CPUE) and that new analysis models should be tried.
Diplodus spp. Cape Verde	278	-	-	-	-	-	No results from assessment	The Working Group decided to adopt a precautionary approach, and recommends an analysis of the data on the abundance index series (CPUE) and that new analysis models should be tried.
Demersal Fishes 2								
Brachydeuterus auritus (Côte d'Ivoire, Ghana, Togo and Benin)	14584	41%	37%	133%	212%	236%	Overexploited	As a precautionary measure and while waiting to receive more precise and complete information, the Working Group recommends a reduction in fishing effort in order not to exceed the 2010 total catch (14 000 tonnes).
Galeoides decadactylus (Côte d'Ivoire, Ghana, Togo and Benin)	2088	55%	50%	98%	142%	158%	Overexploited	Given the results obtained from the assessment and the trends in CPUEs, the Working Group recommends a reduction in fishing effort. The total catch in the zone should not exceed the 2010 level (2 500 tonnes).
Dentex spp. (Côte d'Ivoire, Ghana, Togo and Benin)	6891	-	-	-	-	-	No results from model	As a precautionary measure and in expecatation of more complete and reliable data series being collected in the future and knowing this species was considered to be overexploited during the last assessment and that the CPUEs are at a very low level, the Working Group recommends a reduction in fishing effort, and the catch should not be

Unit/stock	$C_{last\ year}$[1] (tonnes)	Bcur/B_{MSY} (%)	Bcur/B0.1	F_{cur}/Fsy cur (%)	F_{cur}/FMSY	Fcur/F0.1	Status	Management recommendations
								higher than the average of the last three years which is about 6 000 tonnes.
Pagellus bellottii (Côte d'Ivoire, Ghana, Togo and Benin)	4212	51%	46%	95%	142%	158%	Overexploited	Taking into account the results obtained in the assessment and the trends in CPUE, the Working Group recommends reducing effort on this stock and no longer issuing new licences for this fishery. The Working Group also recommends that catches should not be greater than the average of the last three years which is estimated at 4000 tonnes.
Pseudotolithus spp (Côte d'Ivoire, Ghana, Togo and Benin)	2344	117%	107%	93%	77%	85%	Fully exploited	As a precautionary approach and in the hope that the data time series collected will be more complete and reliable for the next meeting, the Working Group recommends not to increase the fishing effort., and the catches should not exceed the average of the last five years estimated at 2 300 tonnes.
Demersal Fishes 3								
Pseudotolithus spp. (Nigeria and Cameroon)	8719	84%	76%	53%	62%	69%	Fully exploited	Given the results obtained in the assessment of the stock of Nigeria and Cameroon and the trends in CPUE, the Working Group recommends a reduction in fishing effort. Total catch should not exceed the 2010 catch of 8 000 tonnes per year for the stock of Nigeria and Cameroon.
Galeoides decadactylus (Nigéria, Cameroon, S. Tome &Guinea Equatorial)	5257	-	-	-	-	-	No results from model	As a precautionary measure and pending more complete information, the Working Group recommends not to increase fishing effort for Nigeria, Cameroon and Equatoral Guinea and Sao Tome & Principe. These fisheries should be monitored carefully.
Cynoglossus spp. (Nigeria and Cameroon)	8828	-	-	-	-	-	No results from model	As a precautionary approach, the Working Group recommends for Cynoglossus spp in Nigeria and Cameroon, a reduction in fishing efforts due to high effort in 2010, and that the fisheries should be closely monitored.
Brachydeuterus auritus (Nigeria)	1165	-	-	-	-	-	No assessments made	The Working Group recommends reducing fishing effort as this species is caught along with other demersal species by the industrial trawlers.
Dentex spp (S Tome & Principe)	193	-	-	-	-	-	No results from model	As a precautionary measure, the Working Group was not in a position to recommend

Unit/stock	$C_{last\ year}$[1] (tonnes)	B_{cur}/B_{MSY} (%)	Bcur/B0.1	F_{cur}/Fsy cur (%)	F_{cur}/FMSY	Fcur/F0.1	Status	Management recommendations
								any specific management measure. Nevertheless, it recommends proceeding with an indepth analysis of the data before the next Working Group meeting.
Pagellus spp (Equatorial Guinea And Sao Tome)	845						No results from model	As a precaution, the effort can be maintained.
Demersal Fishes 4								
Pseudotolithus spp. (Congo, Gabon and Angola)	21 058	55%	50%	117%	170%	189%	Overexploited	Reduce the fishing effort. The total catch should not exceed the average of the last 5 years (32 000 tonnes) for the stock of Gabon, Congo, the Democratic Republic of Congo and Angola.
Galeoides decadactylus (Congo, Gabon and Angola)	4 468	56%	51%	123%	176%	196%	Overexploited	Reduce fishing effort and the total catch should not exceed the average of the last 5 years Gabon, Congo, and Angola stock (4 300 tonnes).
Dentex macrophtalmus (Angola)	17 820	141%	129%	96%	56%	62%	Fully exploited	Total catches should not exceed the average of the last 5 years (18 000 tonnes).
Dentex spp. (Gabon, Democratic Republic of Congo and Angola)	8 076	113%	102%	75%	56%	72%	Fully exploited	Total catches should not exceed the average of the last 5 years (2006-2010) (12 000 tonnes per year)
Cynoglossus spp. (Gabon, Congo and Democratic Republic of Congo)	445*	-	-	-	-	-	No results from model	As a precautionary measure, that catch should not exceed the average of the last 5 years (2006-2010), estimated to be 1 800 tonnes, because the CPUEs are in sharp decline.
Cynoglossus spp. (Angola)	767	74%	67%	137%	172%	191%	Overexploited	Reducef fishing effort and that the total catch should not exceed the average of the last 5 years (600 tonnes).
Brachydeuterus auritus (Congo and Angola)	3 799	46%	42%	181%	278%	308%	Overexploited	Reduce the fishing effort and not exceed the level of catches from 2001 to 2003 (2 000 tonnes)
Arius spp (Gabon and Congo)	756	-	-	-	-	-	No results from model	As a precautionary measure and the CPUE is still low, the Working Group reiterates the 2008 recommendation for Gabon and Congo to reduce fishing effort and limit catches to the 2007 level (500 tonnes).
Pomadasys spp (Gabon, Democratic Republic of Congo and Angola).	965	-	-	-	-	-	No results from model	The CPUE is still lowas in 2008 assessment. Reduce fishing effort and limit catches to the level of 2007 (900 tonnes).
Merluccius polli Angola	4 675	181%	165%	228%	42%	47%	Fully exploited	A general reduction in fishing effort should be undertaken. Special attention should also be given to the problem of bycatch

Unit/stock	$C_{last\ year}$[1] (tonnes)	Bcur/B_{MSY} (%)	Bcur/B0.1	F_{cur}/Fsy cur (%)	F_{cur}/FMSY	Fcur/F0.1	Status	Management recommendations
Shrimps								
Penaeus notalis (Guinea Bissau)	140	-	-	-	-	-	No results from model	As a precautionary approach, not to incre the fishing effort and given the uncertainty about the total catch no recommendation was made for the total catch level, and to review and complete the catch and effort data series from the other industrial fleets and to estimate the catch data from the artisanal fleet.
Penaeus notalis (Guinea)	232**						No results from model	Nnot to exceed the 300 t level until new information is made available to the Working Group
Penaeus notalis (Ghana)	271*	139%	126%	71%	43%	48%	Non- fully exploited	As a precautionary approach thefishing effort should not exceed the level established in the last assessment in 2008 of 170 tonnes from an average of the period 2004–2006.
Penaeus notalis (Congo)	207	135%	123%	86%	56%	62%	Non- Fully exploited	the fishing effort should not exceed the current level. Catch should not exceed the average of 2008–2010 (200 tonnes). The fishery should be closely monitored.
Parapeneus longirostris Guinea -Bissau	1600	139%	126%	93%	57%	63%	Non- fully exploited	Not to increase the fishing effort and the total catch should not exceed the mean of the last three years (2008-2010) of 2000 tonnes
Parapeneus longirostris Congo	791	96%	87%	132%	137%	153%	Fully exploited	Not to increase the fishing effort and to keep the total catch below the landing amount for the last years (about700 tonnes).
Parapeneus longirostris Angola							No results from model	Complete the catch and effort data series of the fish and shrimp trawlers that harvest this species.
Coastal shrimps (Nigeria and Cameroon)	7707						No results from model	The Working Group was not in a position to provide specific management advice for these stocks. However decided to adopt a precautionary approach while waiting to obtain more information. It recommends that no new shrimp licences should be issued for fishing in these stocks.
Coastal shrimps (Democratic Republic of Congo)	7438						No results from model	The data provided to the Working Group for the Democratic Republic of Congo was insufficient to allow any analysis.

Unit/stock	$C_{last\ year}$[1] (tonnes)	B_{cur}/B_{MSY} (%)	Bcur/B0.1	F_{cur}/Fsy cur (%)	F_{cur}/FMSY	Fcur/F0.1	Status	Management recommendations
Cephalopods								
Sepia spp. (Ghana)	2186	40%	36	138%	222%	246%	Overexploited	The situation seems to be worse than in 2008 assessment. In 2010 the increase of the effort has been 65% compared to 2004. Fishing effort should be reduced and catches limited to a maximum of 2 000 tonnes per year.
Sepia spp. (Guinea Bissau)	201	-	-	-	-	-	Not Accepted	As a precautionary measure, the fishing effort should not exceed the level of the average 2007-2009 period (1 900 tons)
Sepia spp (Guinea)	3404*						No assessment	The cuttlefish CPUEs shows an increase trend from 2006The WG reiterates the 2005 and 2008 recommendations that fishing effort should be significantly reduced and catches should in any case not exceed the level reported for 2005 (3 000 tonnes).
Octopus vulgaris (Guinea-Bissau)	631***	150%	136%	34%	17%	19%	Non- fully exploited	The fishing effort should not exceed the level for the period 2007-2009. Catch should not overcome the average of 3000 tonnes. Data provided in 2010 are provisional and are not considered for this recommendation. The WG recommends to review the statistics series of all fleets that harvest this resource.

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FIGURES

STOCKS OVEREXPLOITED

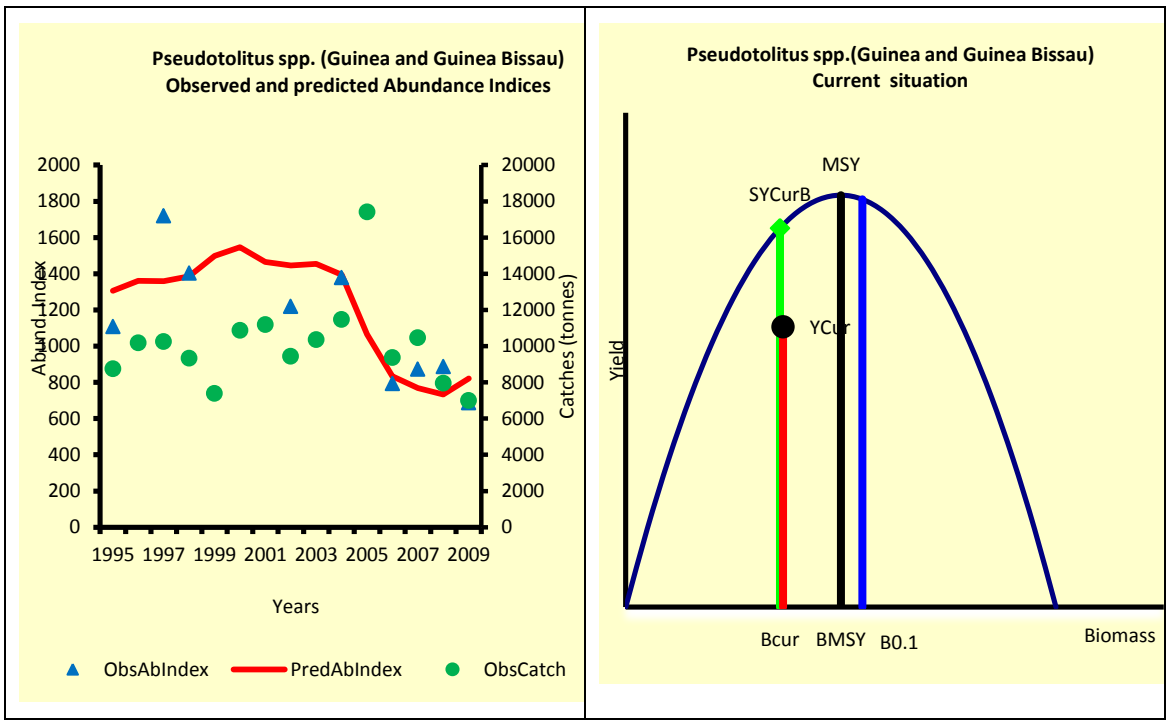

Figure 4. Stock of *Pseudotolitus* spp. In Guinea and Guinea Bissau

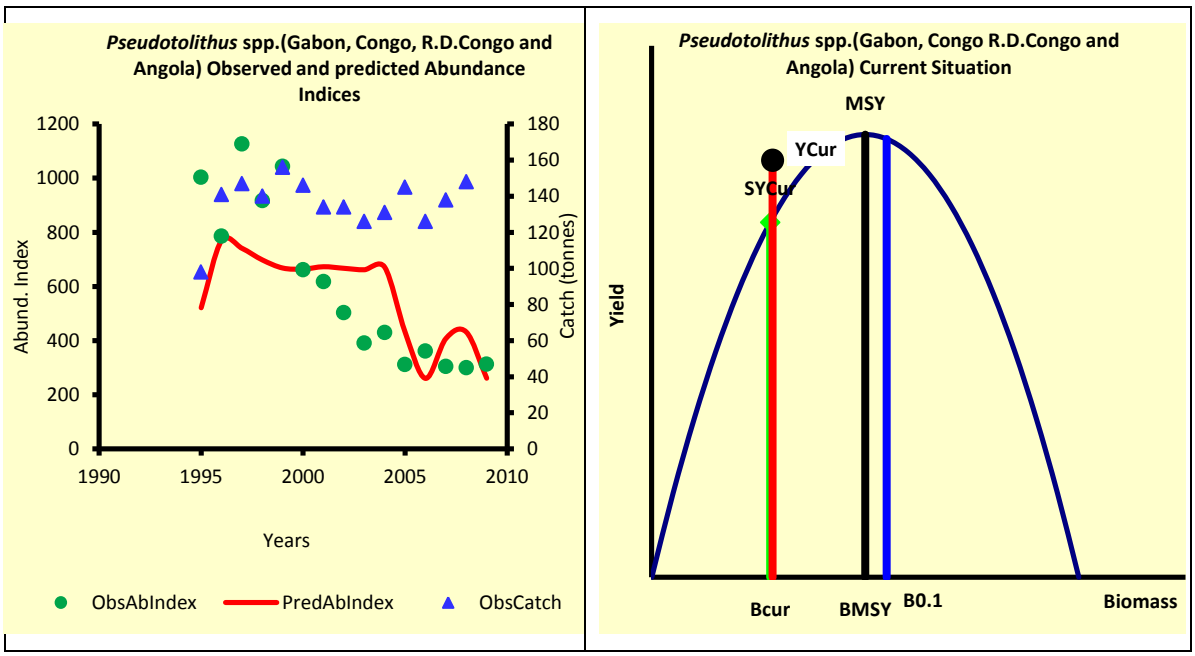

Figure 5. Croakers(*Pseudotolithus* spp.) in Gabon, Congo, Democratic Republic of Congo and Angola

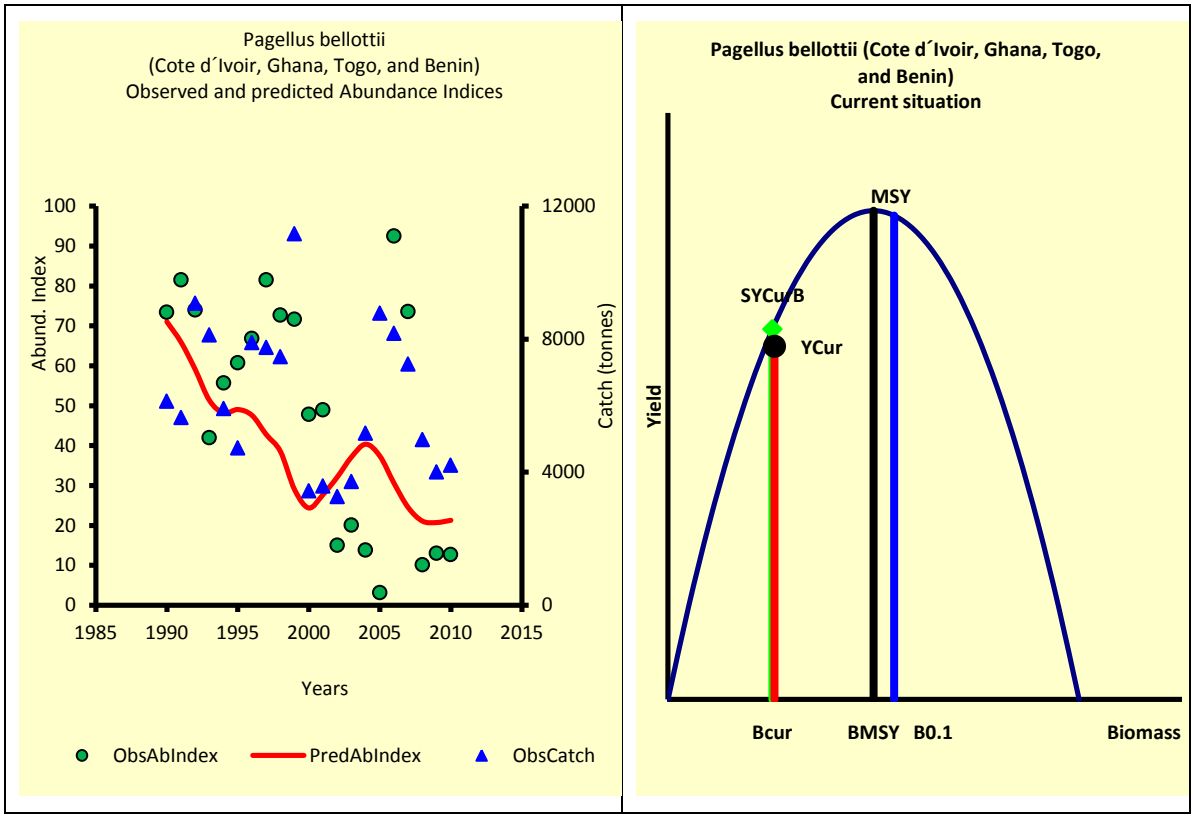

Figure 6. Stock of Red Pandora *(Pagellus bellottii*) in Benin, Togo, Ghana and Côte d'Ivoire

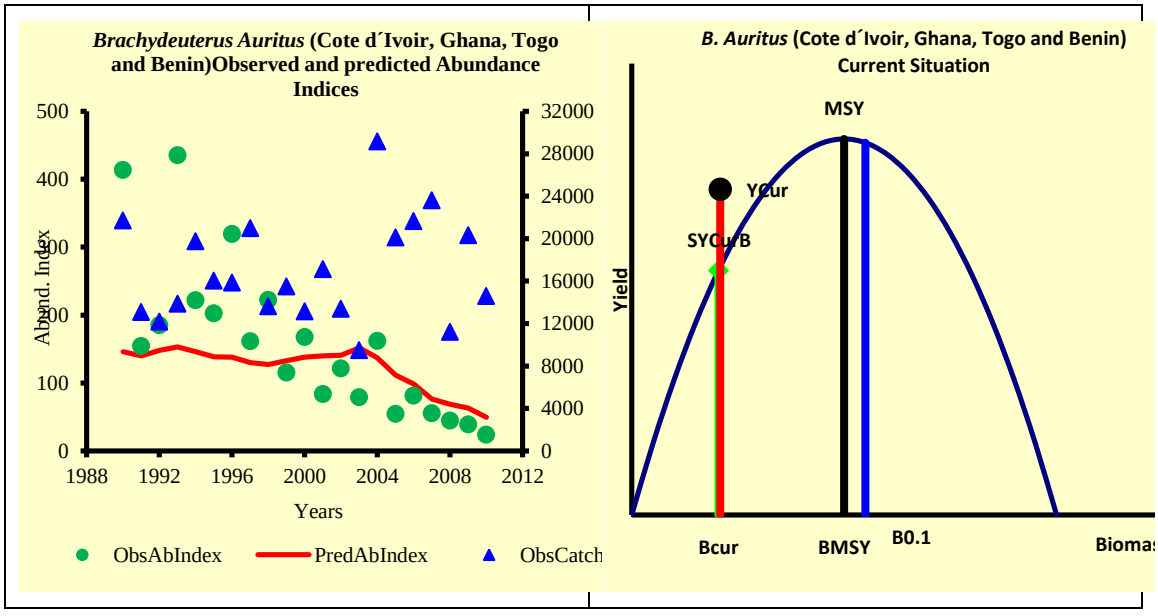

Figure 7. Bigeye grunt *(Brachydeuterus auritus)* stock in Côte d'Ivoire, Ghana, Togo and Benin

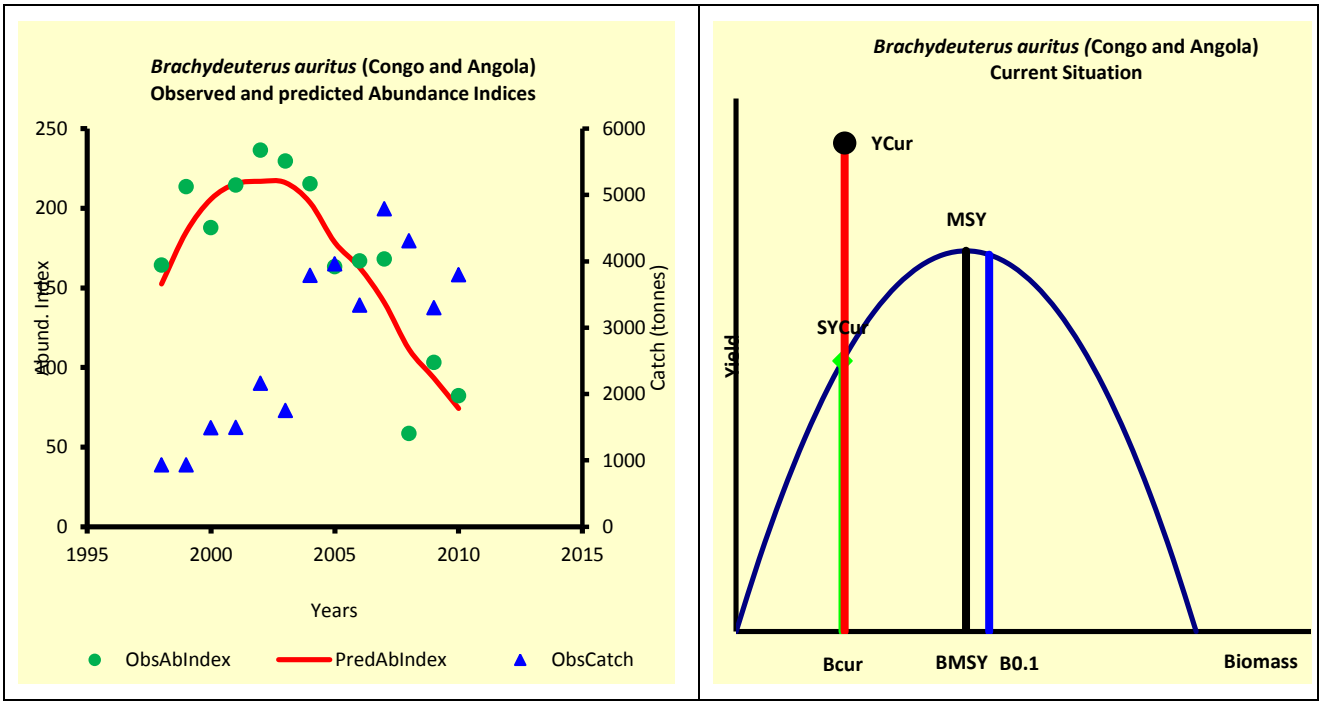

Figure 8. Bigeye grunt *(Brachydeuterus auritus)* in Congo and Angola stock

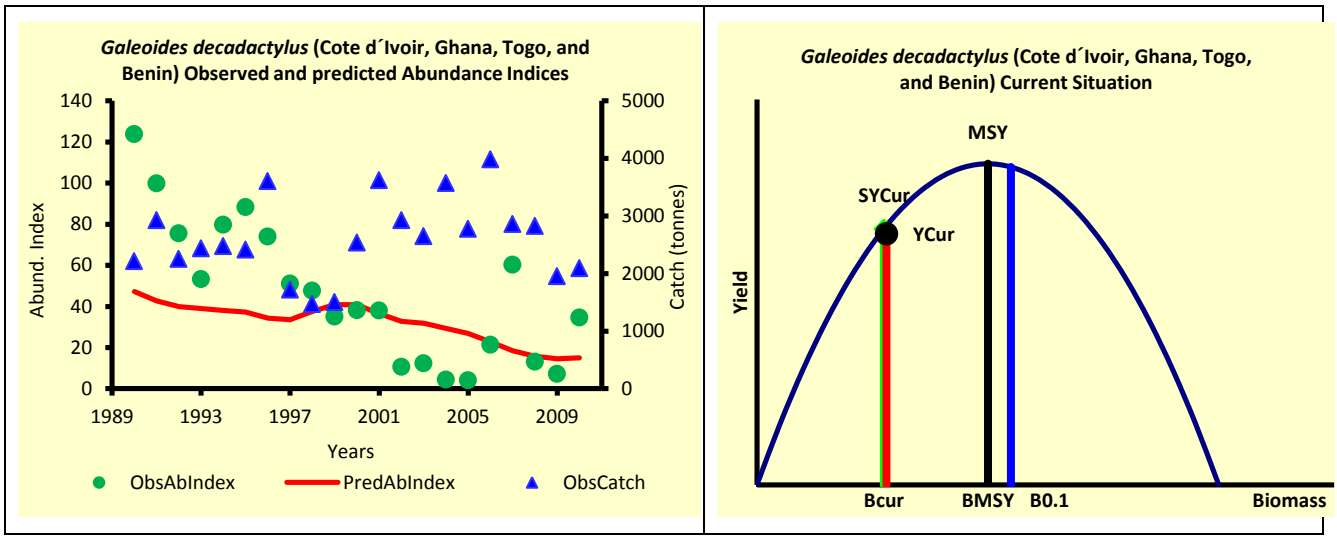

Figure 9- Lesser African threadfin (*Galeoides decatacterus*) stock in Côte d'Ivoire, Ghana, Togo and Benin.

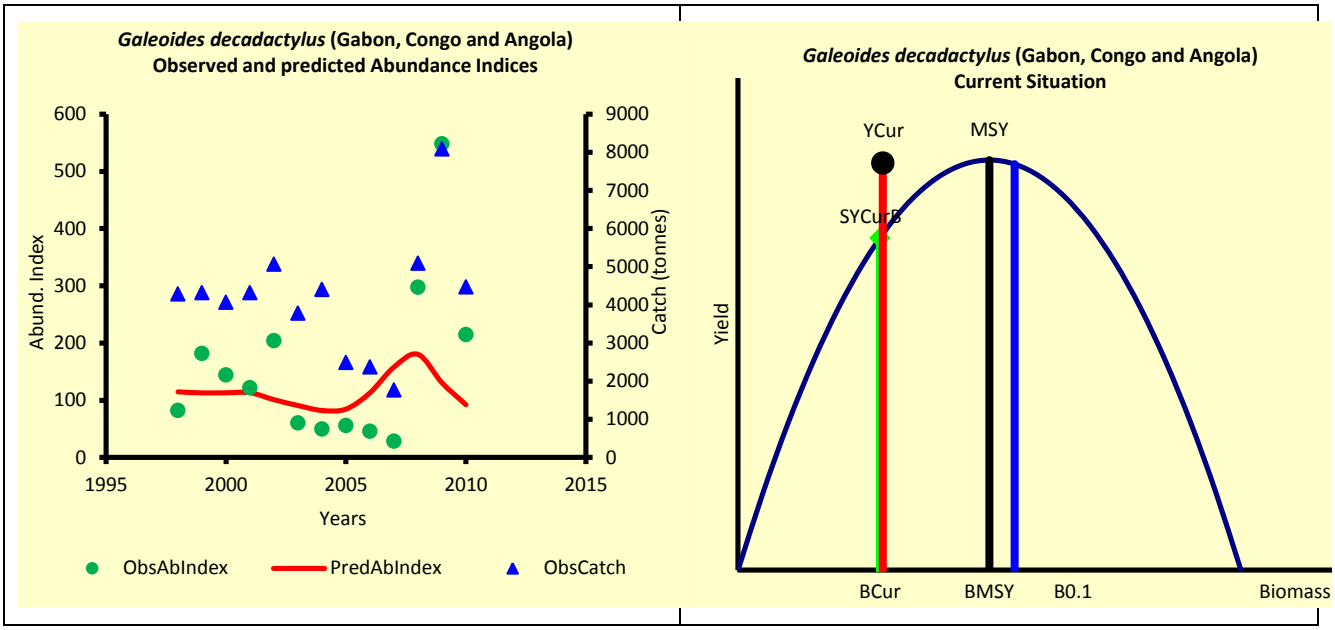

Figure 10. *Galeoides decadactylus* (Gabon, Congo and Angola) stock

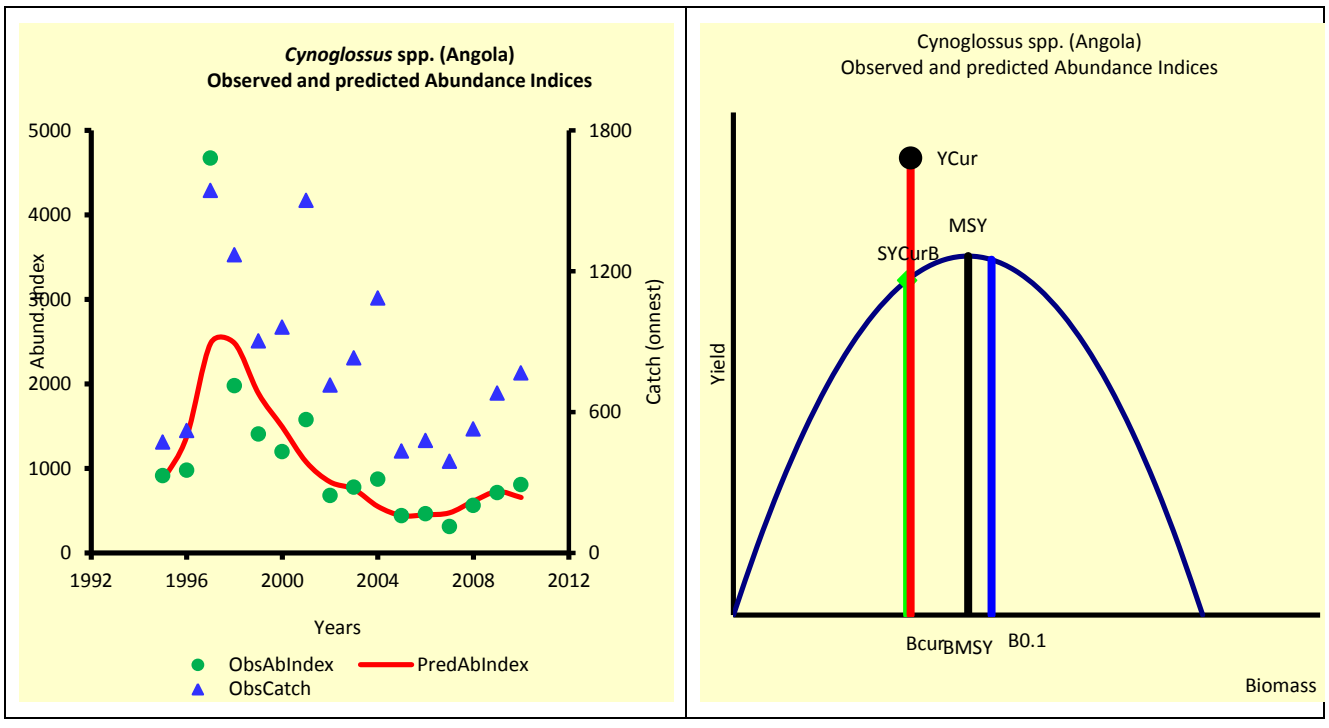

Figure 11. *Cynoglossus* spp.in Angola stock.

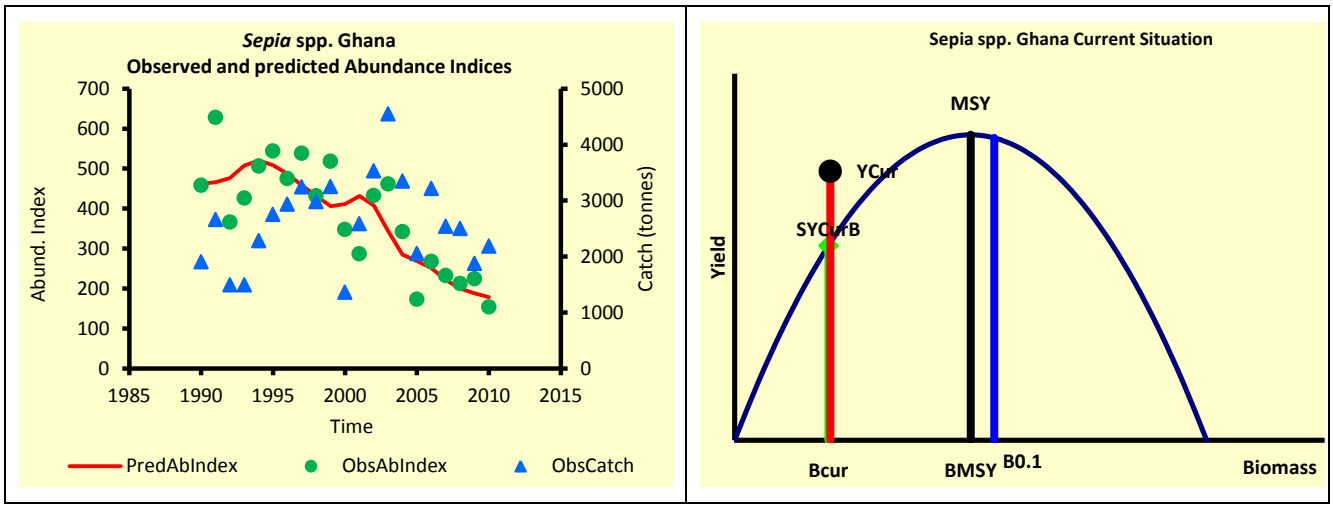

Fig 12. *Sepia* spp. In Ghana stock

SOME EXAMPLES OF FULLY EXPLOITED STOCK

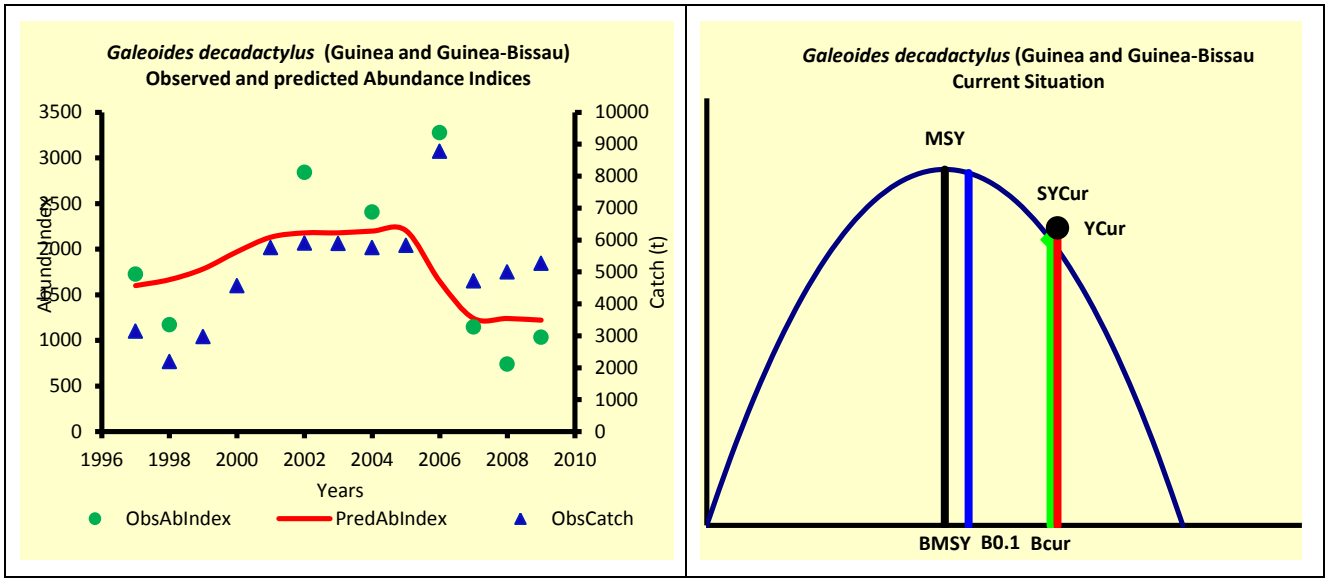

Figure 13- *Galeoides decadactylus* in Guinea Bissau and Guinea

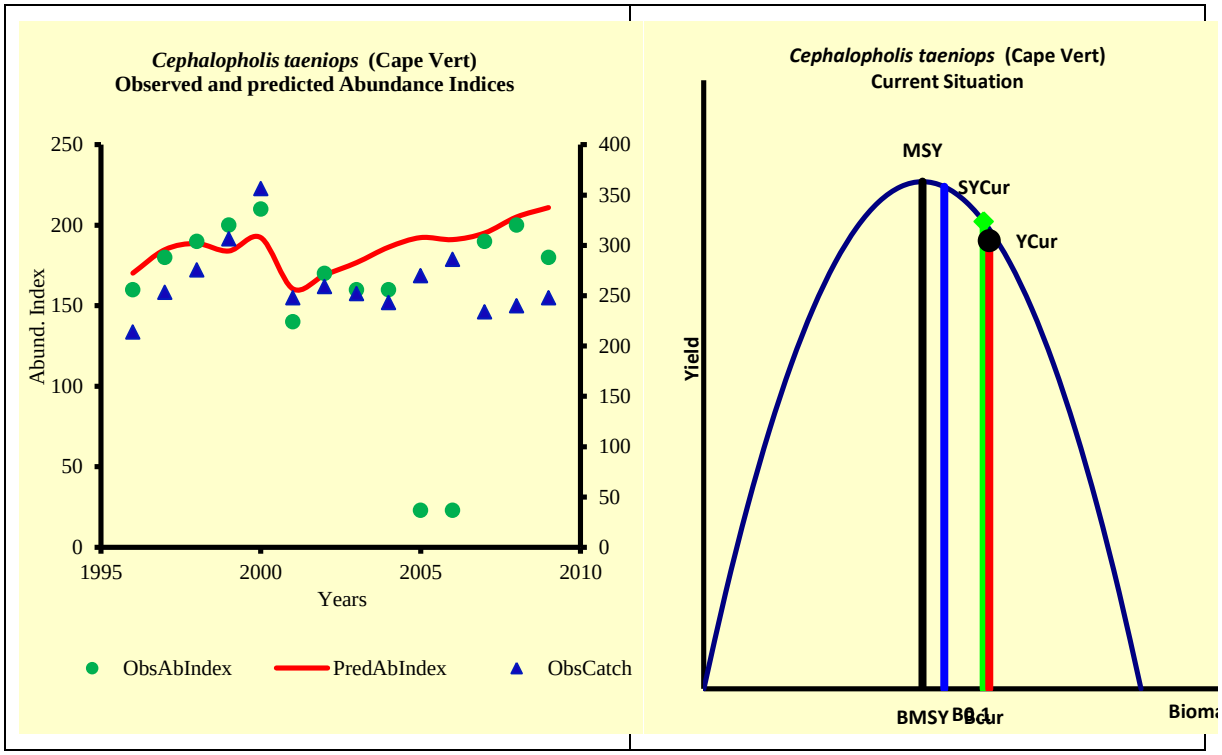

Figure 14. *Cephalopholis taeniops* stock in Cape Verde

EXAMPLE OF NON FULLY EXPLOITED STOCK

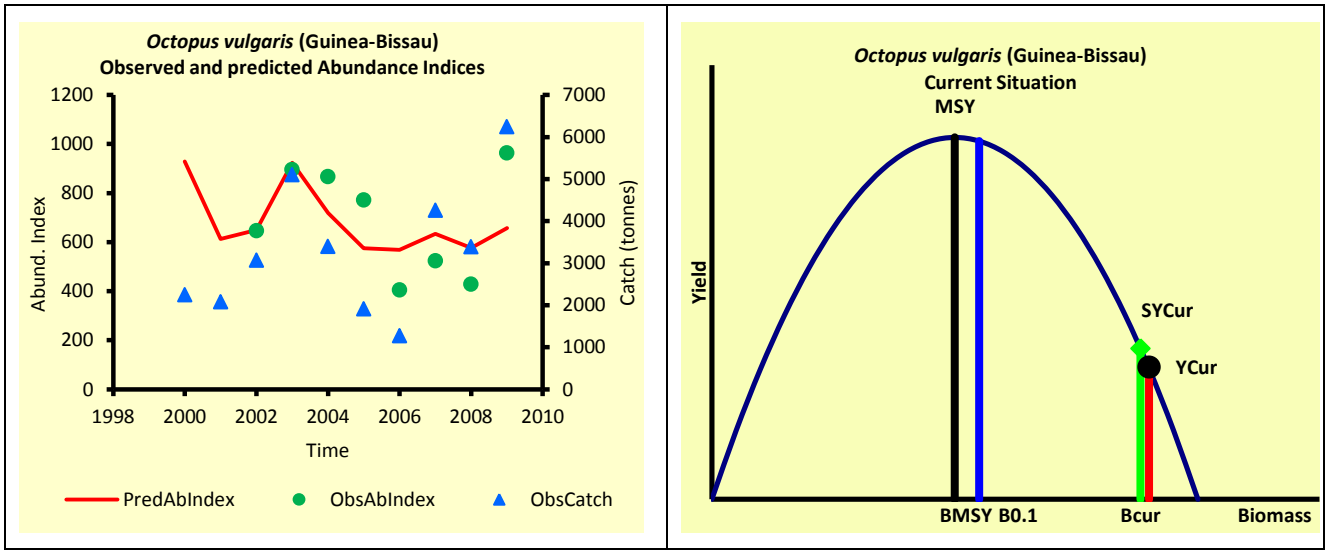

Fig 14 Octopus vulgaris in Guinea-Bissau stock