



Session 02

Influence of climatic variables on *Sardinella* recruitment dynamique in Senegalese waters

Ousmane DIANKHA ^{1,*}, Aliou BA ², Patrice BREHMER ³, Timothée BROCHIER ³, Modou THIAW ⁴, Bamol Ali Sow ⁵, Amadou Thierno GAYE ¹, and Hervé DEMARCO ⁶

¹Université Cheikh Anta Diop (UCAD), Ecole supérieure polytechnique, Laboratoire de Physique de l'Atmosphère et de l'Océan Siméon Fongang (LPAO-SF), BP 5085, Fann Dakar, Sénégal

²Université Cheikh Anta Diop de Dakar, IUPA, BP 206, Dakar, Sénégal

³Institut de Recherche pour le Développement (IRD), UMR 195 Lemar, Dakar, Sénégal

⁴Institut Sénégalais de Recherches agricoles (ISRA), Centre de Recherches Océanographiques de Dakar-Thiaroye, PRH, BP 2241, Dakar, Sénégal

⁵Université Assane Seck de Ziguinchor(UASZ), Laboratoire d'Océanographie, des Sciences de l'Environnement et du Climat (LOSEC), UFR Sciences & Technologies, BP 523, Ziguinchor, Sénégal

⁶Institut de Recherche pour le Développement (IRD), UMR 248 MARBEC (Marine Biodiversity, Exploitation and Conservation), CS 30171, 34203 Sète, France

*Correspondance: Tél: (221) 77 447 57 51; Courriel: ousmane.diankha25@gmail.com (O. DIANKHA)

Reçu le 13/12/2016; publié le 15/03/2017

AWA © MS WP2_S2_18b

Abstract

Several authors, with estimated abundance index, attempted to study the dynamic of *Sardinella* populations in relation with to their environment fluctuations in West African region. However, this relationship still poorly understood because of the complexity and difficulty to estimate this abundance index that depends on a variable difficult to identify, the fishing effort from artisanal fisheries. This study is a contribution to better understand the link between the variability of environmental conditions and the dynamic of *Sardinella aurita* and *Sardinella maderensis* in Senegalese waters using generalized additive model. Recruitment data of these two species estimated from the virtual population analysis model, sea surface temperature, coastal upwelling index, wind speed, surface chlorophyll concentration and north Atlantic oscillation index within 2004-2013 period were used. Our results showed that recruitment of these two small pelagic species are closely linked to changes in the climatic variables tested. However, variables playing the most critical roles differ from one species to another. For the *S. aurita*, the index of coastal upwelling is the most important factor, while for *S. maderensis* is the SST which plays the leading role. This study also reveals the existence of temperature, intensity of upwelling, wind speed, concentration of chlorophyll-*a* and north Atlantic oscillation index thresholds above or below which *Sardinella* recruitment success is low.

Keywords: climatic variables, *Sardinella*, Senegalese waters, recruitment.



Commission Sous-Régionale des Pêches
Sub-Regional Fisheries Commission



International Conference ICAWA 2016

Extended book of Abstract

THE AWA PROJECT
Ecosystem Approach
to the management
of fisheries and the
marine environment
in West African waters

Cap-Vert

Mauritanie

Sénégal

Gambie

Guinée BISSAU

Guinée

Sierra Leone

ISBN: 978-2-9553602-0-5



Bundesministerium
für Bildung
und Forschung



Institut de Recherche
pour le Développement
FRANCE



Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

Trilateral German-French-African research initiative

EDITED BY:

Patrice BREHMER (IRD-France; Dakar), Babacar BA (CSRP, Sub-Region; Banjul) & Gerd KRAUS (TI, Germany; Hamburg).

TECHNICAL SUPPORT: Marie Madeleine GOMEZ (CSRP), Ndagoue DIOGOUL (IRD-UCAD).

WITH THE COLLABORATION OF:

Bamol Ali SOW , Alban LAZAR, Heino FOCK, Xavier CAPET, Aka Marcel KOUASSI, Idrissa Lamine BAMY, Osvaldina SILVA, Eric MACHU, Vamara KONE, Moustapha DEME, Didier JOUFFRE, Joern SCHIMDT, Modou THIAW, Suzanne TRAORE, Abdoulaye DIOP, Justine DOSSA, Didier JOUFFRE, Ibrahima DIALLO, Arnaud COMOLET, Zacharie SOHOU, Hamet DIADHOU, Célestin BLE, Rafael ALMAR, Moussa SALL, Abou BAMBA, Dano J.A. ROELVINK, Ibrahima LY, Marie BONNIN , Dienaba Beye TRAORE, Adama MBAYE, Hassane Dedah FALL, Mohamed M'barek O. SOUEILIM.

ISBN: 978-2-9553602-0-5

Sub Regional Fisheries Commission / Commission Sous Régionale des Pêches ©2017

COVER DESIGN: AWA (BMBF – IRD) project

LOGO AND FLYERS: Laurent CORSINI (IRD)

TRANSLATION: Amadou NDIONE (independent)

SPONSORS ICAWA 2016

