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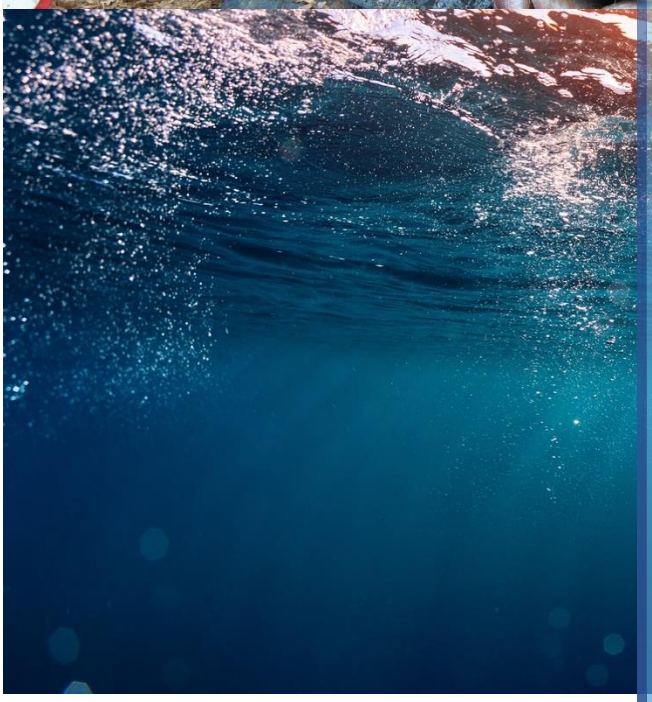


July 2021

Importance of ocean upwelling at the North Kenya Banks for the migratory fish species of the WIO region

Summary of policy-relevant information

SUMMARY OF POLICY-RELEVANT INFORMATION

Importance of ocean upwelling at the North Kenya Banks for the migratory fish species of the WIO region

Points to consider:

Upwelling at the North Kenya Banks is important for migratory fish species across the WIO region

Kenyan blue economy initiatives aspire to exploit marine fisheries resources throughout Kenya's EEZ and especially the North Kenyan Banks

Variability in the location and intensity of upwelling from year to year may impact local Kenyan and Tanzanian fish species and WIO migratory fish species such as tuna

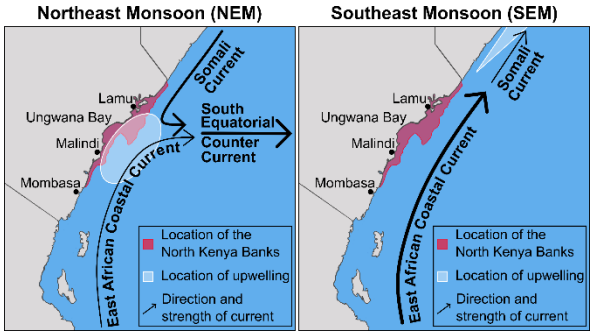
Strong oceanographic and ecological connectivity exists between the North Kenya Banks upwelling and neighbouring Tanzania, Somalia and the High Seas of the wider WIO-region

Sustainable management of the North Kenya Banks is of critical importance not only for Kenya but for the wider WIO region

What is the North Kenyan Banks upwelling system?

The North Kenyan Banks shelf break upwelling is a highly variable and a short-lived oceanographic process that brings deep waters rich in nutrients to the ocean surface. It occurs in the vicinity of the North Kenya Banks (NKB), a broad extension of the otherwise narrow continental shelf during the North-East monsoon, particularly during January-February. At its peak, this upwelling feature is the most pronounced productivity hotspot along the Kenyan coast. The NKB upwelling enhances marine productivity by initiating massive blooms of phytoplankton with the effects cascading through marine food webs. However, the strength, location and spatial extent of upwelling changes from year to year; and in an extreme case (during the 1997-98 El Niño) migrated into the EEZ of neighbouring Tanzania.

What is the regional significance of the NKB upwelling?



Kenya lies in the so-called *Tuna Belt*, and is a member of the Indian Ocean Tuna Commission (IOTC), which shares fisheries data to assess stocks of specific species, and of the South West Indian Ocean Fisheries Commission, which assists in managing other (non-tuna) trans-boundary fisheries resources. Of growing concern is the predicted negative effect of climate change on the commercially important tuna and tuna like species shared by countries in the region. Recent scientific research demonstrates that the NKB region contains important breeding and nursery grounds for migratory fish including tuna and tuna-like species. Upwelling-induced cooler temperatures and higher nutrients may provide delayed onset of climate change impacts in these areas relative to the

rest of the Kenyan waters and further, provide regionally important climate refugia for migratory species. This region is therefore predicted to play a crucial role in the management of commercially important migratory species in the future.

What is Kenya's ambition regarding exploitation of the North Kenyan Banks marine resources?

During Africa's first Sustainable Blue Economy Conference, hosted by Kenya in 2018, President Uhuru Kenyatta noted in his address that Kenya's blue economy sector could easily triple its current contribution to the gross domestic product, create more jobs and bring prosperity to millions of Kenyans. The Kenyan government sees marine fisheries as playing a major part in its blue economy sector strategy and the NKB area is thought to hold considerable economic potential if properly managed and sustainably exploited. However, the NKB region is not currently covered by a management plan and insufficient data exists to optimally manage these fisheries.

What are the key recent scientific advances and gaps in understanding the dynamics of the North Kenya Banks upwelling?

The North Kenya Banks potential for fishery resources was highlight as early as 1959 in the world leading scientific journal Nature. However, progress in understanding the driving mechanisms behind the NKB upwelling system and its significance for local marine ecosystems and fisheries has been slow. Recent national and international research programs however brought a step change in the understanding of this critical system and in the ability to diagnose upwelling impacts using satellite observations and numerical models. Nevertheless, urgent improvements are also required in the collection and sharing of information on fish catch and fishing effort, stock abundance, species distribution and behaviour for key fish species in order to fully understand the North Kenya Banks role within the wider socio-ecological system.

Recommendations

- Inform IOTC on recent scientific advances in characterisation of the North Kenyan Bank upwelling and its potential importance for regional fisheries.
- Initiate and develop a monitoring plan for the North Kenya Banks upwelling system that includes oceanographic and socio-economic components
- Initiate a regional scientific "upwelling-watch" working group via WIOMSA or the Nairobi Convention to facilitate sharing of information on responses of regional upwelling systems to extreme events. Ensure the North Kenya Banks Upwelling is represented in such a group along with Somali, South Madagascar and Pemba Channel upwelling systems.

The information presented in this Summary for Policy Makers is based on the following open access publications:

J.Kamau et al. 2021, **Managing emerging fisheries of the North Kenya Banks in the context of environmental change.** Ocean Coast Manag. https://doi.org/10.1016/j.ocecoaman.2021.105671

Z.Jacobs et al. 2021, **Key climate change stressors of marine ecosystems along the path of the East African Coastal Current**. Ocean Coast Manag., https://doi.org/10.1016/j.ocecoaman.2021.105627

J. Mwaluma et al. 2021, **Assemblage structure and distribution of fish larvae on the North Kenya Banks during the Southeast Monsoon season.** Ocean Coast Manag., https://doi.org/10.1016/j.ocecoaman.2021.105800