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SAPPHIRE PROJECT



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The key features of the North Kenya Banks upwelling and a need for a risk-based approach to fisheries management



SUMMARY OF POLICY-RELEVANT INFORMATION

The key features of the North Kenya Banks upwelling and a need for a risk-based approach to fisheries management

Key Messages:

The North Kenya Banks form an important ecological habitat however the local community is not well capacitated to take advantage of this resource.

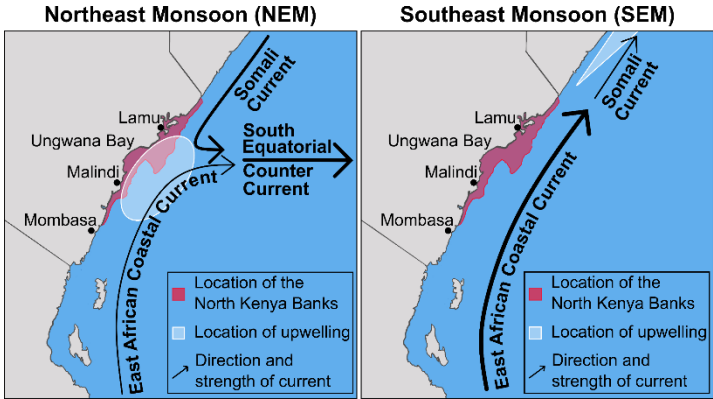
The sea is rough during the South East Monsoon when the NKB is highly productive. Local fishermen don't have the necessary capacity to fish in rough seas.

Market outlets are not well developed as such the fishermen are limited by demand on what they can catch during the high fishery seasons.

The fishery ground lacks clear management structures to ensure sustainable exploitation

The North Kenya Banks

Kenya's coastal zone is characterized by a narrow continental shelf that widens at the northern part near the Somalian border where it extends to about 60 km offshore. The wider part of the continental shelf is referred to as the North Kenya Banks (NKB). The NKB supports multiple fisheries and appears highly productive on seasonal timescales.



Regional oceanographic circulation of the WIO region during the Northeast and Southeast monsoon periods.

Oceanographic features of the North Kenya Banks

Kenyan marine waters have been documented as being nutrient poor. However, regional fisheries thrive under the influence of monsoon-driven upwelling systems. The upper-ocean circulation is influenced by the East African Coastal Current and the Somali Current. The confluence of these two currents during the Northeast Monsoon triggers shelf break upwelling that brings deep nutrient rich waters to the surface enhancing productivity. However, this upwelling feature is highly variable, changing its strength, location and spatial extent from year to year; and in an extreme case (during the 1997-98 El Niño) migrated fully into the EEZ of neighbouring Tanzania. How this regionally important upwelling will evolve over the course of the coming decades under the accelerating impact of global warming is still outside predictive modelling capabilities.

Internationally shared fisheries

Recent scientific research demonstrates that the NKB region contains important breeding and nursery grounds for migratory fish including tuna and tuna-like species. Kenya lies within the Tuna belt and is a member of the Indian Ocean Tuna Commission (IOTC). The NKB region is therefore predicted to play a crucial role in the management of commercially important migratory species in the future and requires development of a tuna and tuna-like species monitoring strategy. Kenyan EEZ shows strong circulation connectivity to the EEZs of Somalia and Tanzania as well as the high seas, resulting in its significant exposure and vulnerability to extraction activities and fisheries management in these areas.

Management challenges

The absence of a comprehensive management plan for the small and medium pelagic fishery creates a key management obstacle in the endeavour to expand the fishery offshore. Expansion of this fishery can be likened to the creation of a new fishery but without previous experience of coping with strong seasonal and interannual variability in the key oceanographic features which control recruitment and retention of key commercial species. Such a previous history would have built up skills and approaches to cope with the strong environmental variability typical of the NKB region. Without such skills, a risk-based management approach becomes essential.

Recommendations

- Develop fisheries management plans which consider strong variability in the North Kenya Banks upwelling, its associated productivity and uncertainty of its response to climate change. Allow for adjustment of management measures as new information becomes available.
- Evaluate the overall exposure of the fishery to climate stressors and expected impacts, including uncertainty in response of the NKB upwelling strength and location as climate change progresses.
- Ensure adaptive capacity of the emergent fleet to anticipate and respond to natural variability and to minimise, cope with, and recover from the consequences.
- Strengthen expertise in operational remote sensing. Investigate feasibility of remote sensing data guiding fishing fleets to locate fish schools more efficiently.
- Develop risk-based management approaches to cope with “good” and “bad” years for productivity and fisheries yield. Establish management mechanisms that protect stocks from overfishing during the bad years, as well as the livelihoods of all actors involved.

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

Kamau, et al., (2021) **Managing the emerging fisheries of the North Kenya Banks in the context of environmental change** -Ocean and Coastal Management <https://doi.org/10.1016/j.ocecoaman.2021.105671>

Jacobs, et al., (2020) **Shelf-Break Upwelling and Productivity Over the North Kenya Banks: The Importance of Large-Scale Ocean Dynamics**. Journal of Geophysical Research. <https://doi.org/10.1029/2019JC015519>

