

# **A Journey through my Research Career: Towards Establishing Fisheries Co-management Plans along the Kenya Coast**

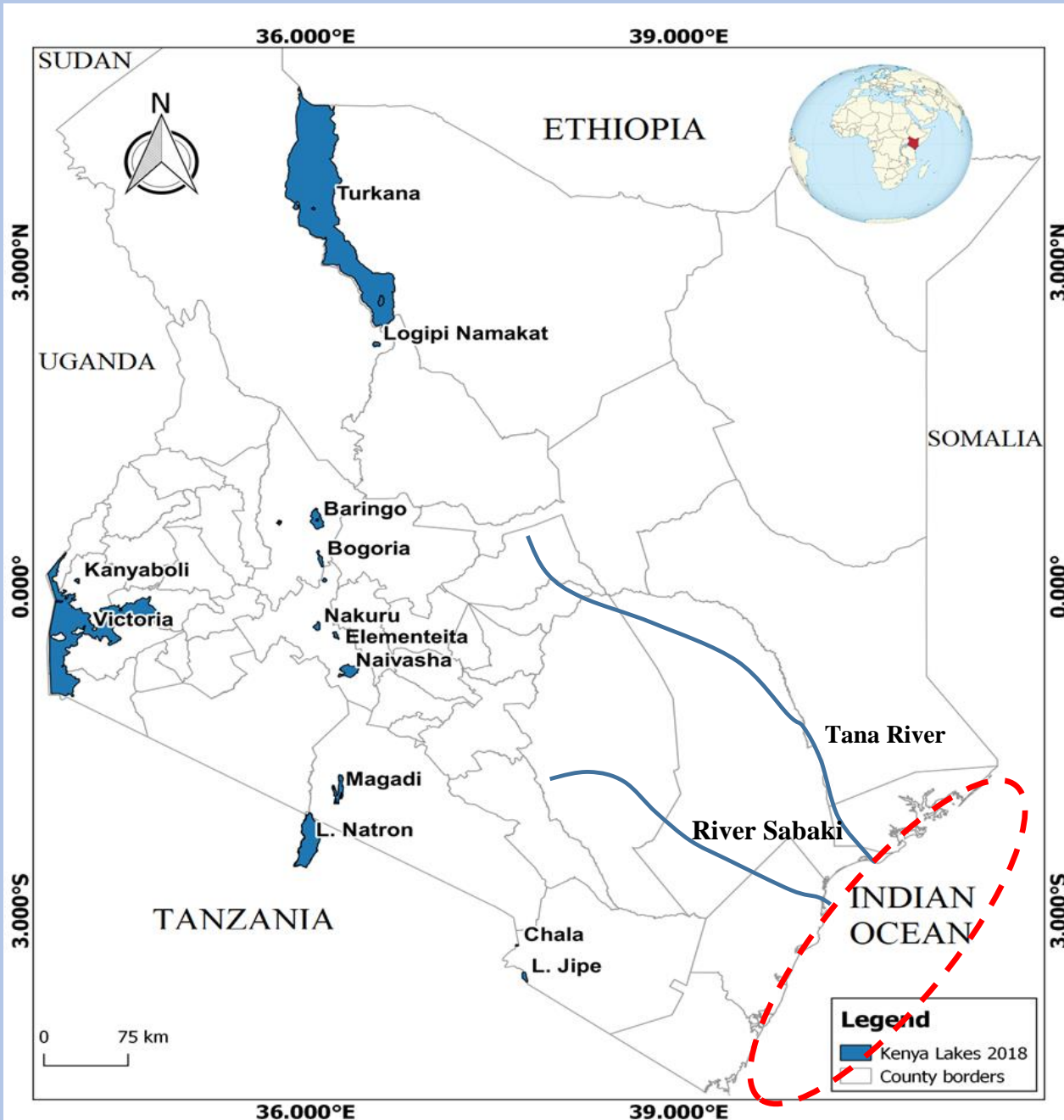
**Cosmas Munga  
Coordinator, Marine and Fisheries Programme  
Technical University of Mombasa, Kenya**

**Keynote Presentation**

Alumni Event on Oceans of Opportunities, Rivers of Ideas, VUB & UGent  
5 – 9 December 2018



# Kenyan Major Rivers, Lakes & Part of the Indian Ocean



L. Turkana = 7,500 km<sup>2</sup>

L. Victoria = 4,100 km<sup>2</sup>

L. Baringo = 137 km<sup>2</sup>

L. Naivasha = 120 km<sup>2</sup>

Tana River = 850 km

Sabaki River = 650 km

Territorial waters = 9,700 km<sup>2</sup>

EEZ = 142,400 km<sup>2</sup>

Map modified from Aura et al., (2018)

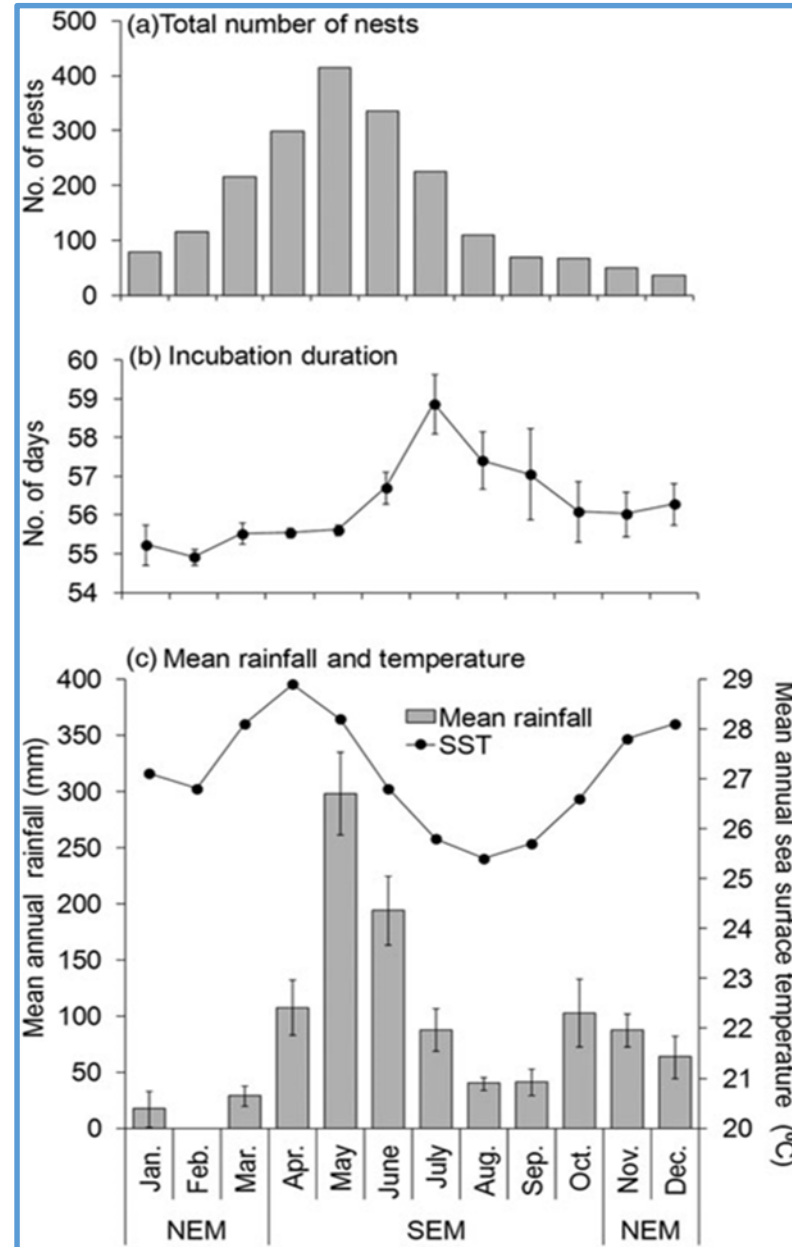
# Who is Cosmas Munga?

- A Senior Lecturer/Research Fellow based at Technical University of Mombasa, Kenya
- Over 15 years research and teaching experience in both marine artisanal and semi-industrial fisheries





# Areas of research interest



Olendo et al., (2017)

# Ongoing Research Work

## Estuarize-WIO

*A socio-ecological assessment of fisheries in three estuarine systems of the SW Indian Ocean – identifying essential links for improved governance*



### WP3 – Small-scale fisheries and their effects on trophic dynamics

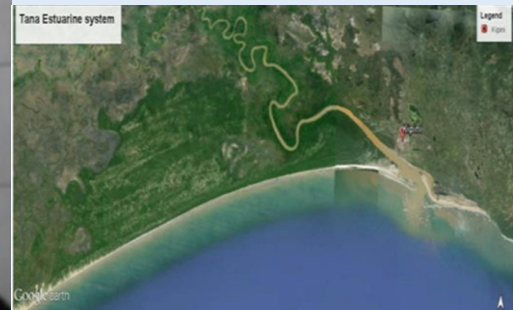
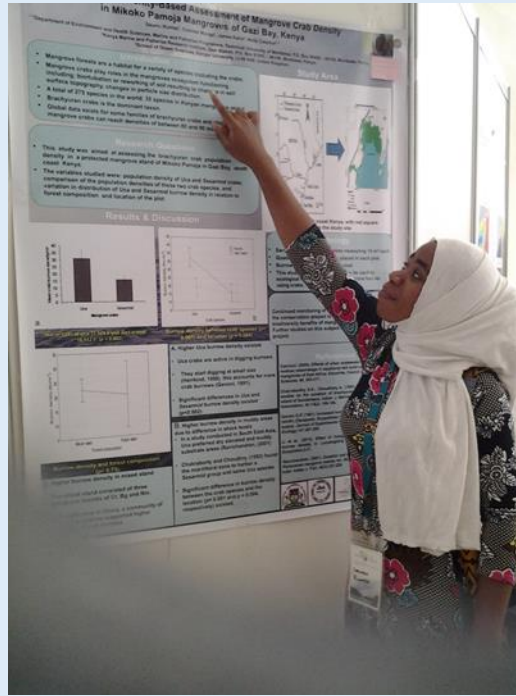
#### Aims

- Characterize small-scale fisheries (#fishers, gear and craft types, fishing grounds, catch composition, seasonal & inter-annual fluctuations)
- Develop size spectra of total catches across gears (selectivity properties)
- Compare ecological stability across 3 estuaries, based on catch/size distributions/trophic levels
- [Working hypothesis: Fishing pattern (i.e. selective or balanced) affects ecological stability]





# Education & Capacity Building Engagements



# Contribution to Science

Ocean & Coastal Management 98 (2014) 130–139



Contents lists available at ScienceDirect

Ocean & Coastal Management

journal homepage: [www.elsevier.com/locate/ocecoaman](http://www.elsevier.com/locate/ocecoaman)



Propulsion-gear-based characterisation of artisanal fisheries in the Malindi-Ungwana Bay, Kenya and its use for fisheries management



Cosmas N. Munga<sup>a,b,c,\*</sup>, Johnstone O. Omukoto<sup>a</sup>, Edward N. Kimani<sup>a</sup>, Ann Vanreusel<sup>b</sup>

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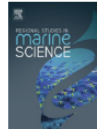
Regional Studies in Marine Science



Contents lists available at ScienceDirect

Regional Studies in Marine Science

journal homepage: [www.elsevier.com/locate/rsma](http://www.elsevier.com/locate/rsma)



Spatial variation in benthopelagic fish assemblage structure along coastal East Africa from recent bottom trawl surveys

Deep Kuunda, Anasa<sup>a,b</sup>, Cosmas Munga<sup>b</sup>, Julius Manyala<sup>a</sup>, Bernad Kuyumu<sup>c</sup>

*Western Indian Ocean J. Mar. Sci. Vol. 13, No. 2, pp. 177 - 188, 2014*  
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## Fish Catch Composition of Artisanal and Bottom Trawl Fisheries in Malindi-Ungwana Bay, Kenya: A Cause for Conflict?

Cosmas N. Munga<sup>1,4,\*</sup>, Stephen Mwangi<sup>1</sup>, Harrison Ong'anda<sup>1</sup>, Renison Ruwa<sup>1</sup>, Julius Manyala<sup>2</sup>, Johan C. Groeneveld<sup>3</sup>, Edward Kimani<sup>4</sup> and Ann Vanreusel<sup>4</sup>

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<sup>2</sup>University of Eldoret, Department of Fisheries and Aquatic Sciences, PO 1125 – 30100, Eldoret, Kenya; <sup>3</sup>Oceanographic Research Institute, 1 King Shaka Avenue, Durban, South Africa; <sup>4</sup>Gent University, Marine Biology Research Group, Krijgslaan 281 – 58, 9000, Gent, Belgium;

<sup>5</sup>Technical University of Mombasa, Department of Environment and Health Sciences, Marine Sciences Section, PO Box 90420, 80100 Mombasa, Kenya.

## The value of long-term, community-based monitoring of marine turtle nesting: a study in the Lamu archipelago, Kenya

MIKE I. OLENDI, GLADYS M. OKEMWA, COSMAS N. MUNGA, LILIAN K. MULUPI, LILY D. MWASI, HASSAN B. MOHAMED, MXOLISI SIBANDA and HARRISON O. ONG'ANDA

Fisheries Research 147 (2013) 93–102



Contents lists available at SciVerse ScienceDirect

Fisheries Research

journal homepage: [www.elsevier.com/locate/fishres](http://www.elsevier.com/locate/fishres)



Species composition, distribution patterns and population structure of penaeid shrimps in Malindi-Ungwana Bay, Kenya, based on experimental bottom trawl surveys



Cosmas N. Munga<sup>a,d,\*</sup>, Stephen Mwangi<sup>a</sup>, Harrison Ong'anda<sup>a</sup>, Renison Ruwa<sup>a</sup>, Julius Manyala<sup>b</sup>, Johan C. Groeneveld<sup>c</sup>, Edward Kimani<sup>a</sup>, Ann Vanreusel<sup>d</sup>

<sup>a</sup> Kenya Marine and Fisheries Research Institute, P.O. Box 81651, 80100 Mombasa, Kenya

<sup>b</sup> University of Eldoret, Department of Fisheries and Aquatic Sciences, P.O. Box 1125, 30100 Eldoret, Kenya

<sup>c</sup> Oceanographic Research Institute, 1 King Shaka Avenue, Durban, South Africa

<sup>d</sup> Gent University, Marine Biology Research Group, Krijgslaan 281, 58, 9000 Gent, Belgium

Fish Sci (2012) 78:209–219

DOI 10.1007/s12562-011-0458-0

ORIGINAL ARTICLE

Fisheries

## Bottom shrimp trawling impacts on species distribution and fishery dynamics; Ungwana Bay fishery Kenya before and after the 2006 trawl ban

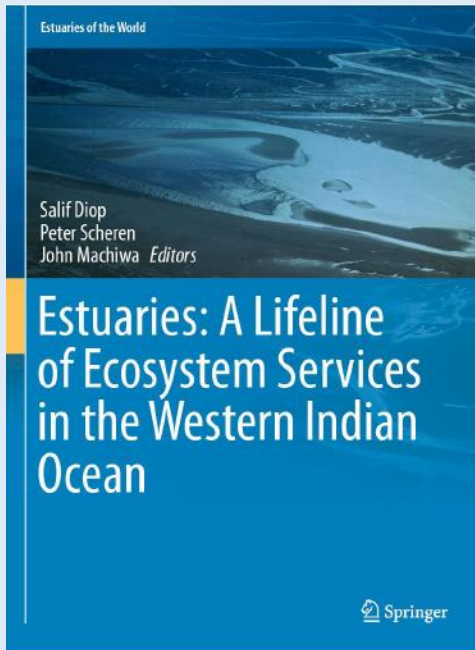
Cosmas Munga · Stephen Ndegwa · Bernerd Fulanda · Julius Manyala · Edward Kimani · Jun Ohtomi · Ann Vanreusel

Received: 10 September 2011 / Accepted: 14 December 2011 / Published online: 4 February 2012

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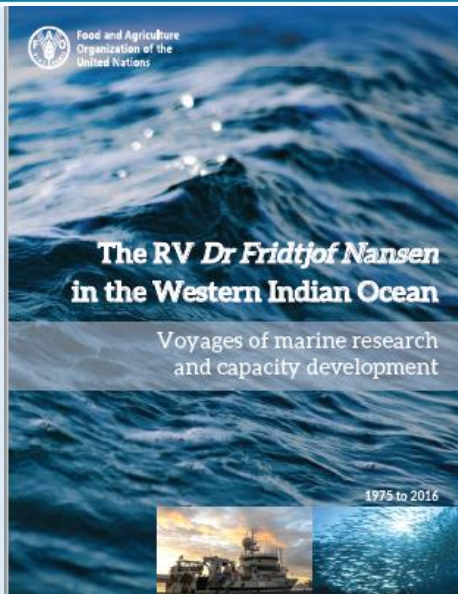


# More Contributions to Science



## **Species Composition of Fisheries Resources of the Tana and Sabaki Estuaries in the Malindi-Ungwana Bay, Kenya**

Cosmas N. Munga, Edward Kimani, Renison K. Ruwa, and Ann Vanreusel



## Chapter 6



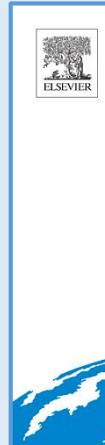
## **Pelagic resources based on acoustic recordings and trawl sampling**

Jens-Otto Krakstad, Cosmas Nzaka Munga and Tore Strømme



# More Contributions to Science

Scientific Reviewer in:

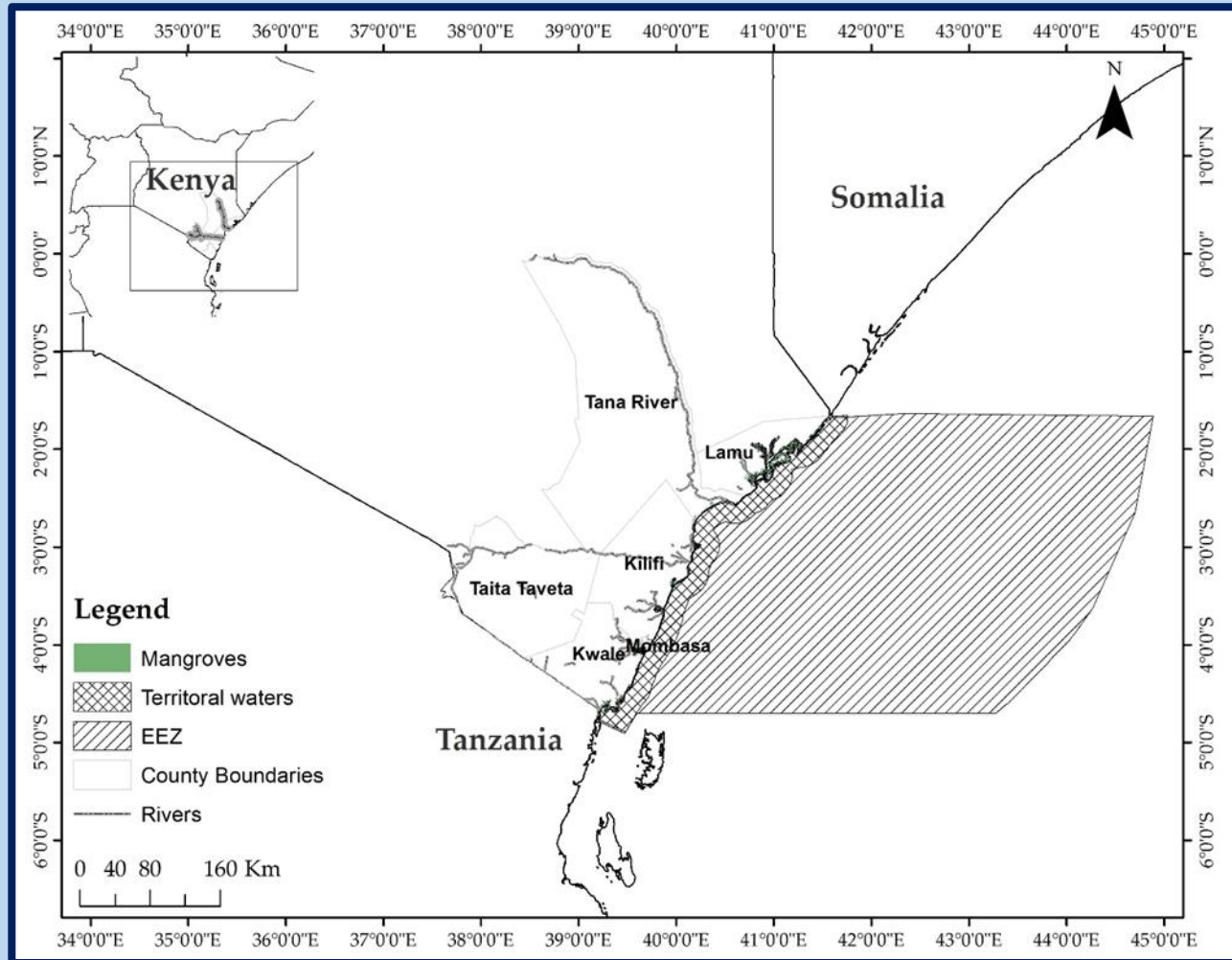


The Editors of OCEAN AND COASTAL MANAGEMENT  
Elsevier, Amsterdam, The Netherlands

The Editors of FISHERIES RESEARCH  
Elsevier, Amsterdam, The Netherlands

# Contributions to Community

## The Coast Region Economic Bloc (JKP) – Sector Lead in Fisheries & Aquaculture



### MEMORANDUM OF UNDERSTANDING

BETWEEN

MOMBASA COUNTY GOVERNMENT  
KWALE COUNTY GOVERNMENT  
KILIFI COUNTY GOVERNMENT  
TANA RIVER COUNTY GOVERNMENT  
LAMU COUNTY GOVERNMENT  
TAITA TAVETA COUNTY GOVERNMENT

AND

PWANI UNIVERSITY  
TECHNICAL UNIVERSITY OF MOMBASA  
TAITA TAVETA UNIVERSITY COLLEGE  
UMMA UNIVERSITY

### Priority Sectors:

- Agriculture (Horticulture)
- Livestock
- Fisheries, Aquaculture & Blue Economy
- Health

# Contributions to Community

## JKP Preliminary achievements



FOR

JUMUIYA-YA-KAUNTI-ZA-PWANI (JKP) SOCIO-ECONOMIC  
BLOCK

JANUARY, 2018

### Proposed Fisheries & Blue Economy Priority Projects:

- ✓ JKP offshore fishing training school
- ✓ Revolving fund for supply of modern fishing equipment
- ✓ Modern fish ports and multi-use cold stores
- ✓ Modern fishing equipment manufacturing industry (nets & boats)
- ✓ JKP deep sea fishing fleet
- ✓ A multi-species hatchery for fingerling production and supply
- ✓ JKP fish feed production and supply industry
- ✓ Upscaling sea weed production and processing



# Contributions to Community

## JKP Preliminary achievements



## 1<sup>ST</sup> JUMUIYA AGRIBUSINESS & BLUE ECONOMY INVESTMENT CONFERENCE 2018

19<sup>th</sup> - 20<sup>th</sup> NOVEMBER 2018



**JABEIC 2018**  
**CHANGING THE STORY**

The conference highlighted:

- Key projects for private sector investments & donor funding
- Common projects across the coastal region
- Business opportunities

EU Funding of KES 2.5 Billion for a project 'Go Blue' involving:

- Community-Based marine conservation initiatives
- Community-Based marine eco-tourism

# Contributions to Community

## Promotion of Community-based Sustainable Fisheries

### Characterization and Mapping of Natural Resources and Social Targets for Pate Island in North Coast Kenya

The Nature Conservancy in Partnership with Northern Rangelands Trust and Pate Marine Community Conservancy



Towards Establishing Fisheries Co-Management Plans in Pate Island, Lamu County, Kenya

Process Report

December 2016

### FISHERIES AND SOCIO-ECONOMIC ASSESSMENT OF SHIMONI-VANGA AREA, SOUTH COAST KENYA



TOWARDS COORDINATION AND DEVELOPMENT OF JOINT CO-MANAGEMENT AREA (CMA) PLANS FOR IMPROVED, INTEGRATED MANAGEMENT OF KENYA'S COASTAL AND MARINE FISHERIES RESOURCES

*Draft Report*

COMRED COASTAL CONSULTING

SEPTEMBER 2016







# Contributions to Community

## Deliverables of Community-based Sustainable Fisheries

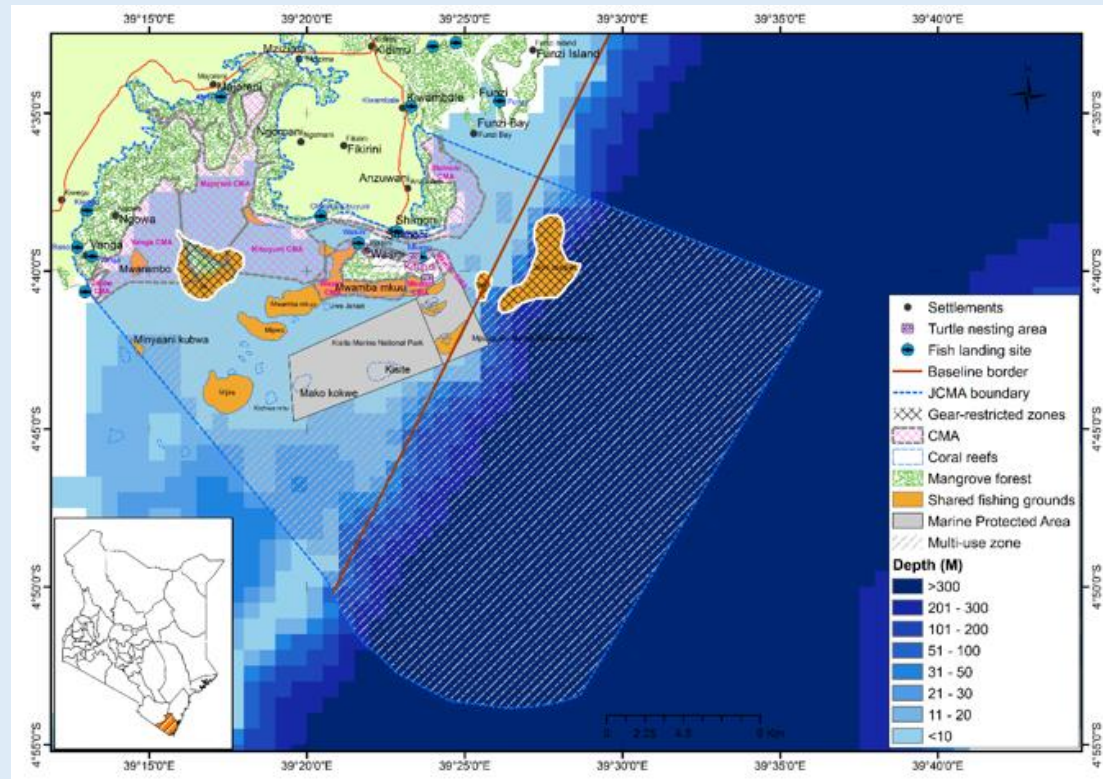
THE REPUBLIC OF KENYA  
MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES



THE SHIMONI-VANGA JOINT FISHERIES CO-MANAGEMENT  
AREA PLAN



A FIVE-YEAR (2017 - 2021) CO-MANAGEMENT PLAN TO GUIDE THE  
DEVELOPMENT OF SHIMONI-VANGA JOINT FISHERIES CO-  
MANAGEMENT AREA



Use zones within Shimoni-Vanga Fishery  
Joint Management Area

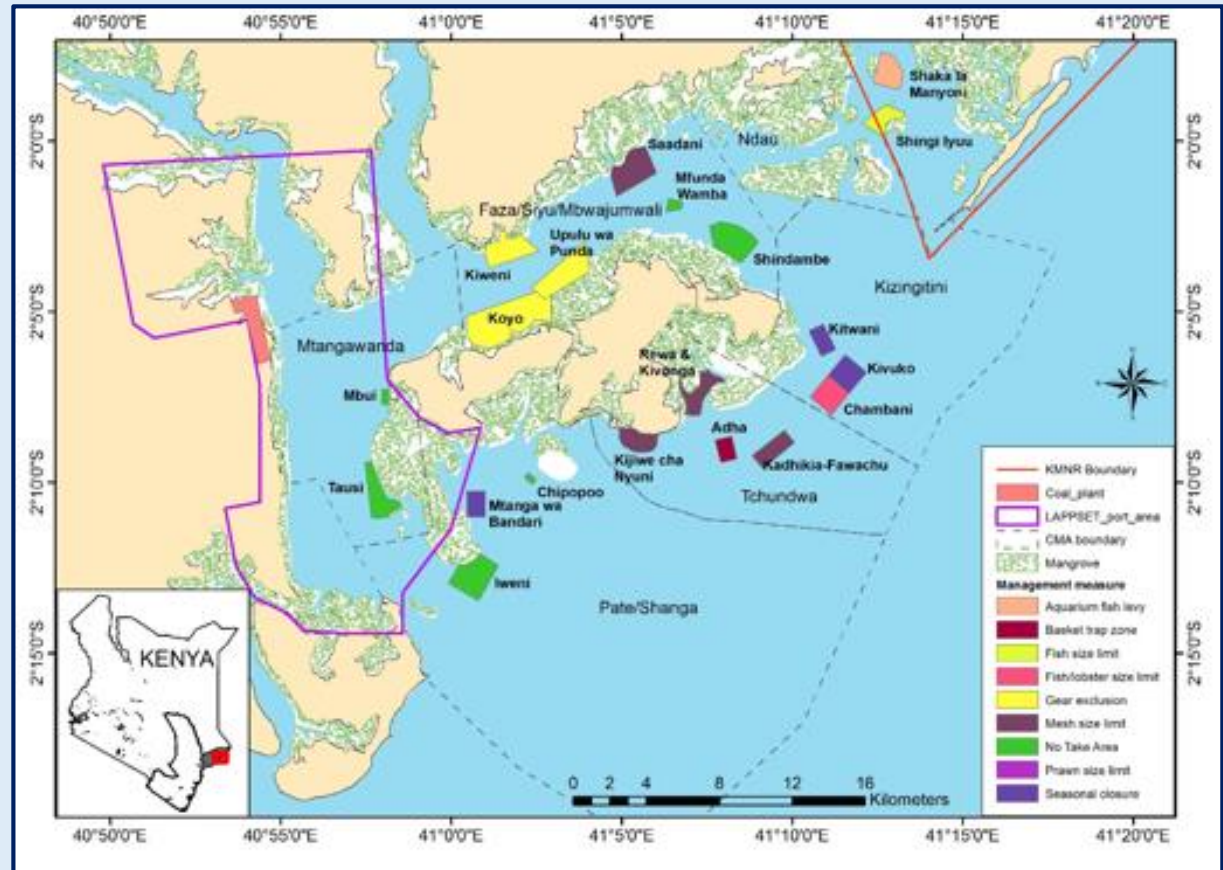


# Contributions to Community

## Deliverables of Community-based Sustainable Fisheries

**A total of 6 fisheries co-management plans around Pate:**

- Kizingitini Co-management Plan
- Mtangawanda Co-management Plan
- Ndau Co-management Plan
- Pate-Shanga Joint Co-management Plan
- Faza-Siyu-Mbwajumwali Joint Co-management Plan
- Tchundwa Co-management Plan



The Pate Island, Lamu showing mapped fisheries co-management areas and use zones

# Conclusions

**There are so many research opportunities in oceans and lakes, but this needs:**

- ✓ **Dedicated research & skills; know your area of competency**
- ✓ **Longer hours of work**
- ✓ **Appropriate network of good researchers**
- ✓ **Adequate and timely funding required**

# ACKNOWLEDGEMENT



Oceans of Opportunities, Rivers of Ideas