WIO

Guidelines on Mangrove Ecosystem Restoration

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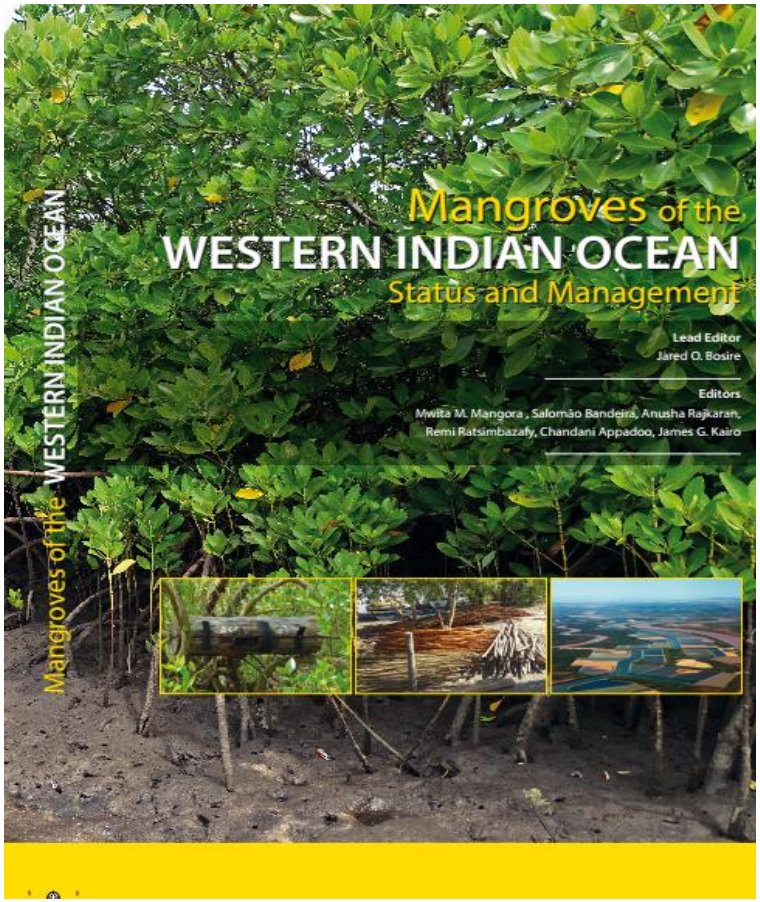
WIO-MN mission



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Available!online:!!http://blog.wiomsa.net/wp5content/uploads/2016/09/Mangroves5of5theWIO.jpg!

- ***Oct. 2011***
- ***Expertise sharing…***
- ***Standardization of methodologies …***
- ***Production of regional publications …***
- ***Raising the profile of mangroves as a critically important ecosystem….***
- ***Development and delivery of community based training programs on sustainable mangrove management and conservation***

Mangroves of the WIO

Country	Mangrove area (ha)	No. of species
Somalia	3 000	6
Kenya	61000	9
Tanzania	181000	9
Mozambique	390,500	9
South Africa	1 921	4
Madagascar	314,000	8
Seychelles	1,900	7
Mauritius	145	2
Comoros	91	7

A healthy Rhizophora stand, *Lamu Kenya*

A an old growth Avicennia stand, Rufiji, Tanzania

Competing land use – rice *vs* mangrove planting

Degraded Rhizophora stand

replanted mangrove forest

A forest in transition - Need to understand, modify, manage site conditions

Why we plant mangroves?

- Enhance **resource sustainability** e.g. wood products
- **Habitat and biodiversity** restoration
- **Shoreline protection** and coastal landscaping
- **Carbon capture** and storage
- **Aesthetic values** incl. social enrichment
- **Fisheries resilience** and enhancement
- **Introduction of new** mangrove locations and adapting to climate change
- Legislative compliance

Sonneratia – 7 t/ha; 5yrs)

Rhizophora – 106 t/ha; 12 years

Growth rates of different mangrove

Species	Growth rates (m/yr)
Sonneratia alba	1.1
Avicennia marina	1.0
Rhizophora mucronata	0.8
Bruguiera gymnorhiza	0.8
Ceriops tagal	0.3
Xylocarpus granatum	0.8

Rhizophora mucronata,
19yrs. Gazi

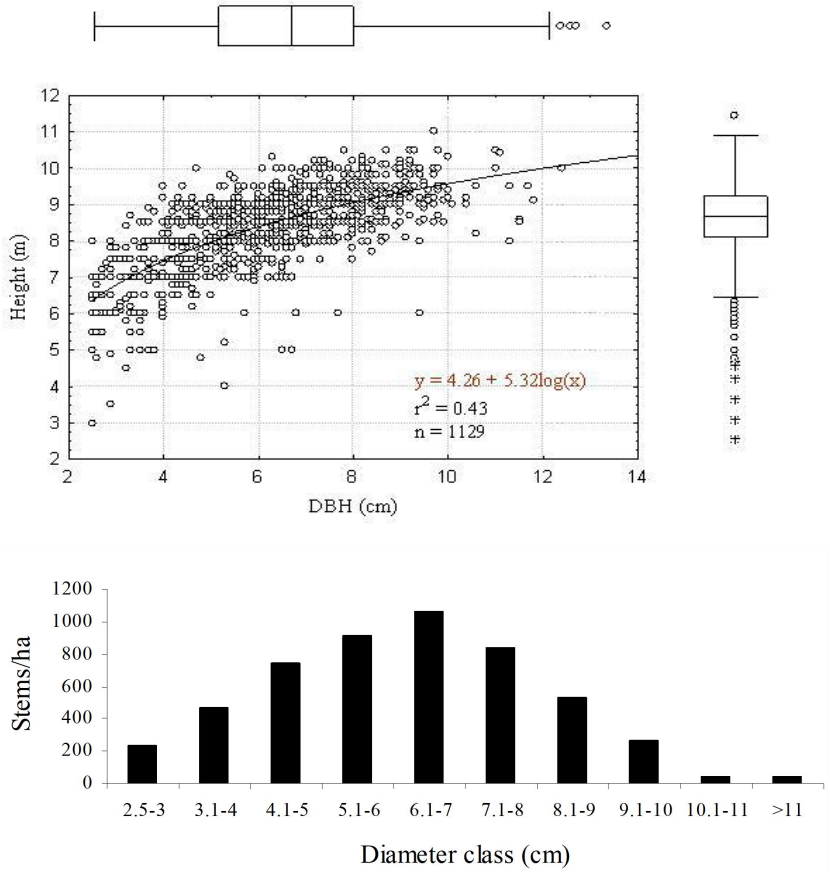
Ceriops tagal, Mozambique

Mixed Rhizophora/Bruguiera plantation. 1 yr. Assassin bay, Madagascar

Self-planting mangroves….

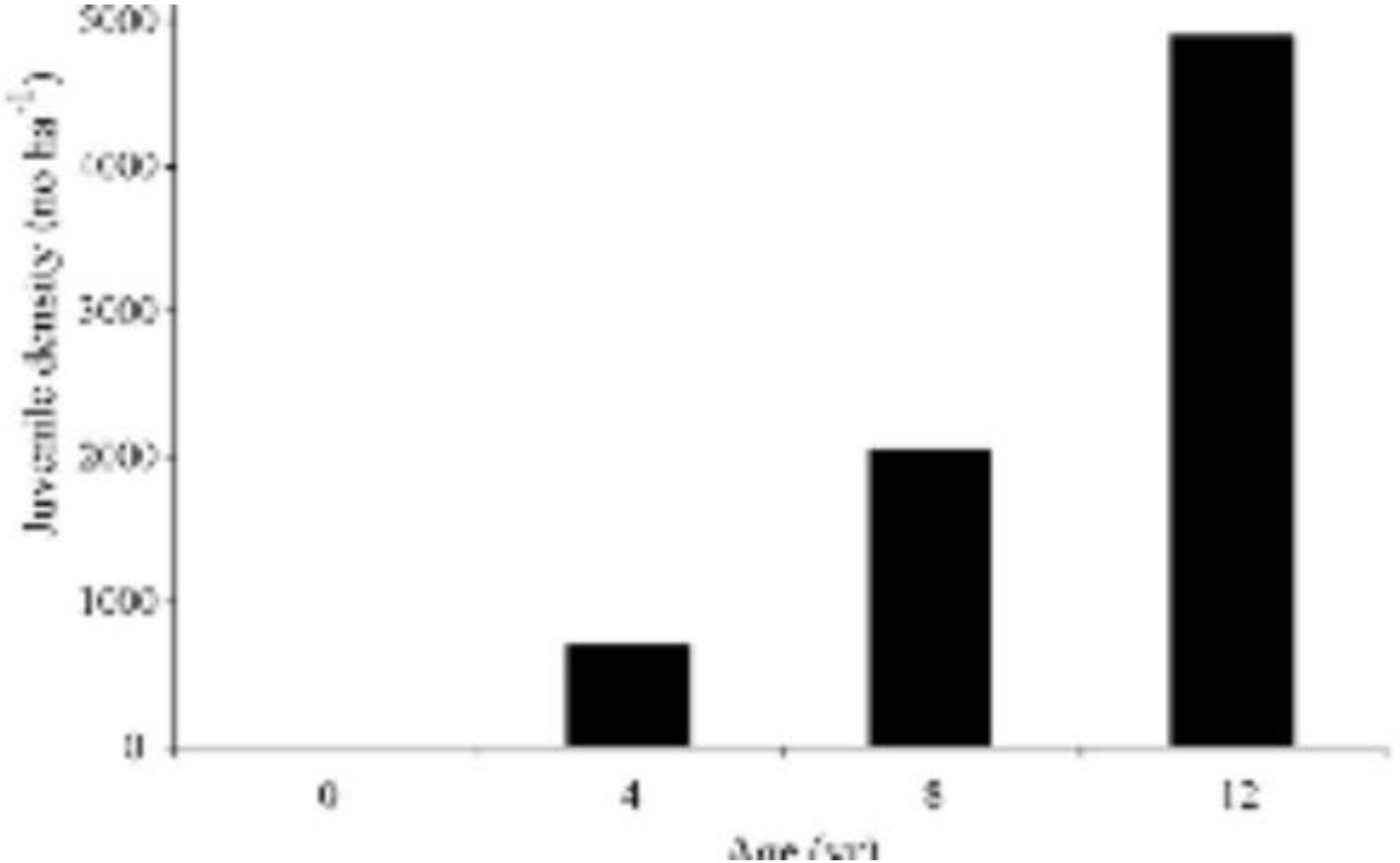
Structural Characteristics of Replanted Forests

- Stand density 5130 stems/ha
- 86% of the wood of the required quality and size (>5cm dbh)
- Biomass = 106.6t/ha
- Even aged forest

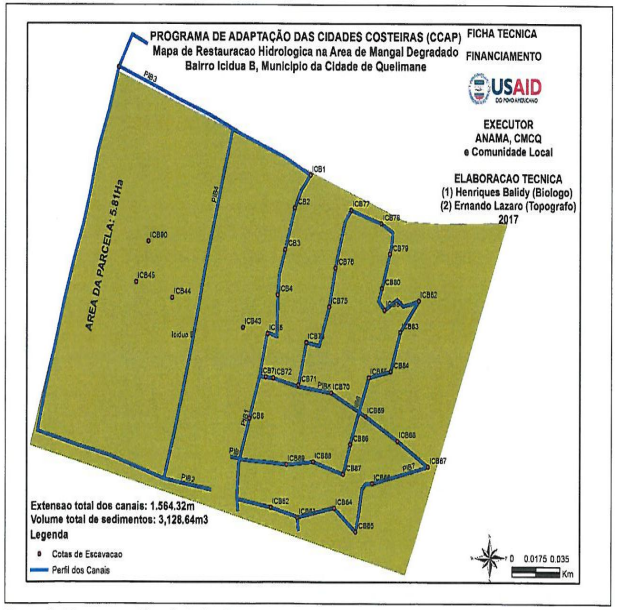


Source: *Kairo et al 2008. Forest Ecology and Management*

Natural recruitment



Hydrological Restoration – Quelimane, Mozambique



Wasted effort

Cause of restoration failures

- Poor **species-site** marching
- Poor understanding of **species ecology**
- **Changes in site** conditions
- Lack of **monitoring plan**
- Inadequate **financing**
- Lack of **community participation**
- Limited **extension services**

Important Questions

- Can mangroves be **planted** and managed like any other terrestrial forests?
- When/how/where do we establish mangrove **nurseries/plantations?**
- What is the indicator of a **successful** mangrove restoration project?
- What is the role of local **community**?
- How can we **finance** mangrove restoration projects

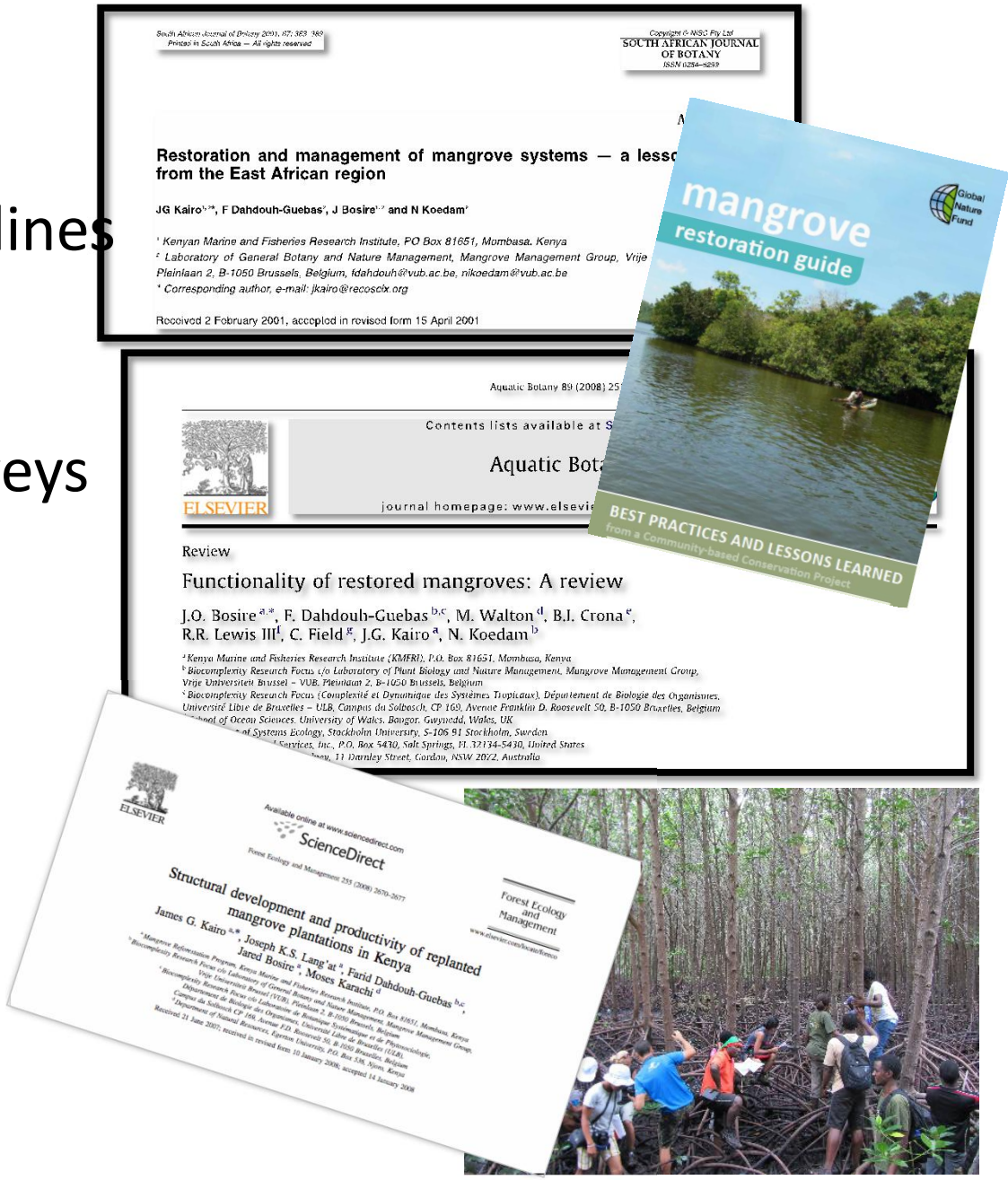
Project Objectives

To develop… a *WIO Mangrove Ecosystem Restoration* Guidelines

- Help users in the region focus on what would work for them
- Assist users to better plan and match available tools to their situation

Approach used

- Peer reviewed publications/guidelines
- Expert knowledge
- Site Visits
- Questionnaire surveys
- Community best practices
- Expert/Peer Review
- MSc student (2)



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Chapter 4: A restoration protocol – principles of Best Practice

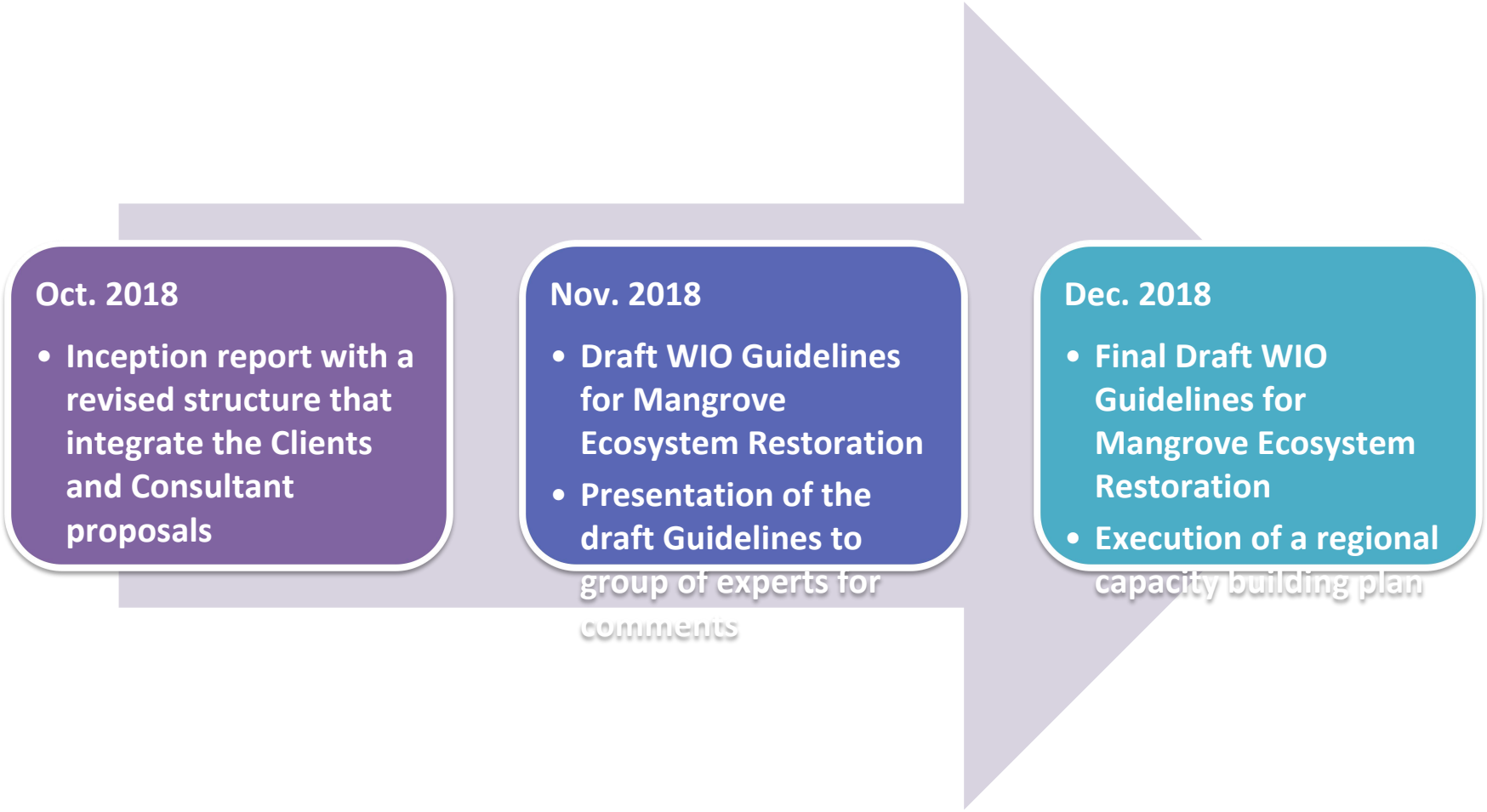
i. Elements of restoration plans
ii. Public participation
iii. Nursery basics
iv. Site preparation
v. Establishment, maintenance budgeting

Chapter 5: Is restoration working? Implementing a systematic monitoring plan

i. Linking program objectives and monitoring
ii. Indicators of success
iii. Sampling protocols
iv. Silviculture management
v. Mitigation measures and communication strategies

Chapter 6: Developing a mangrove restoration management plan

Approved Workplan



Revised Workplan

Nov. 2018

- Inception report with a revised structure that integrate the Clients proposal and Consultants' expert proposals

Dec. 2018

- Draft WIO Guidelines for Mangrove Ecosystem Restoration
- Write shops in consultations with WIOMN team
- Presentation of the draft Guidelines to group of experts for comments

Jan. 2019

- Final Draft WIO Guidelines for Mangrove Ecosystem Restoration
- Execution of a regional capacity building plan

2019

- Piloting the tool during WIO mangrove training in Tanzania
- Side event at the Society of Ecological Restoration- South Africa
- Final version of record after necessary revisions

Thank you

KENYA MARINE AND FISHERIES RESEARCH INSTITUTE
K.M.F.R.I

WMN
WIO MANGROVE NETWORK

Nairobi Convention

UNITED STATES AGENCY INTERNATIONAL DEVELOPMENT
USAID

UN environment