



Dugongs (*Dugong dugon*) of the Western Indian Ocean Region: – Identity, Distribution, Status, Threats and Management

Proposing Organization:

Associação para a Conservação e Protecção dos Dugongos e Especies de Mamiferos marinhos (Dugongos.org)



Partners:

Seychelles Islands Foundation

Kenya Wildlife Services & KMFRI (Kenya),

SEASENSE (Tanzania) IMS (Zanzibar)

Eduardo Mondlane University (Moz)

NMMU (South Africa)

University of Cape Peninsula (South Africa)

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Outline

- Principal investigators and Co-investigators
- Project duration and funding
- Rationale
- Project aims
- specific objectives
- Expected Outputs
- Specific sites of the project
- Capacity building component
- Accomplished activities
- Publications
- Regional progress
- Planned activities until March 2018 (and beyond)

Principal Investigators

- Dr Vic Cockcroft, Nelson Mandela Metropolitan University, South Africa
- Dr Ken Findlay, Technical University of Cape Peninsula, South Africa
- Dr Almeida Guissamulo, Universidade Eduardo Mondlane, Maputo, Mozambique (also **Mozambique Co-ordinator**)

Co - Investigators

- Dr Omar A. Amir, Ministry of Livestock and Fisheries, Zanzibar (**Zanzibar Co-ordinator**)
- Dr. Frauke Fleischer-Dogley, Seychelles Islands Foundation; (**Seychelles Co-ordinator**).
- Dr Mohamed O.S. Mohamed, Kenya Wildlife Service, Mombasa, Kenya. (**Kenya Co-ordinator**).
- Dr Narriman S.Jiddawi, Institute of Marine Sciences, P.O. Box 668 Zanzibar, Tanzania.
- Dr Jacob Ochiewo, Kenya Marine and Fisheries Research Institute (KMFRI), Mombasa. (**Socio – Economic Aspect Co-ordinator**).
- **Dr Michel Vely, Megaptera, BP 5002 97300 Cayenne, French Guiana. (**Comoros and Mayotte Co-ordinator**).
- Lindsey West, Sea Sense, Dar Es Salaam, Tanzania. (**Tanzania Mainland Co-ordinator**).

Project Duration and Funding

- **Project period:** July 2013 to March 2018.
- **Total Budget excluding co-financing US\$ 480 278**
- **Total Budget including co-financing US\$ 767 744**
- Multi-national partners across the coastal waters of Kenya, Tanzania, Mozambique, (the Comoros Mayotte?) and the Seychelles

Rationale

- A brief review of known contemporary distribution and abundance (Marsh et al 2011) suggests that:
- dugongs have declined markedly across their Western Indian Ocean range (coastal waters between Kenya and Mozambique, and in Island Nation coastal waters) over the last 30 years,
- the status of the East African dugong meta-population is in dire need of re-evaluation.



Project Aims

- to investigate the conservation status of dugongs across the region in relation to identified threat issues (develop knowledge base and integrate cutting edge technology – *acoustic loggers and genetic* - with community knowledge),
- to identify a series of appropriate management strategies for implementation at regional and national levels.
- development of a series of Conservation Management Plans or Guidelines for the species, to inform conservation in each particular “hotspot” area

Specific objectives

- identification of the range through habitat modelling;
- population genetics analyses across the range to determine population identity;
- abundance estimation and trend estimation (where previous abundance estimates exist);
- simulation modelling (PVA or PHVA) of population trajectories where declining trends have been identified;
- the identification of threats and impact hotspots where populations are threatened; and
- the identification and implementation of management strategies to mitigate anthropogenic population stressors.

Specific sites of the Project

- Pre-identified hotspots/areas:
- In Kenya - northern Ungwana Bay to Lamu and the southern Gazi Bay to Vanga regions;
- In Tanzania: the Rufiji Delta and Mafia Island regions,
- Mayotte, and the Comoros Archipelago (only habitat)
- In Mozambique: the Quirimbas, Primeiras and Segundas, and Bazaruto Archipelagos and Inhambane and Maputo Bays.

Project expected outputs

- **Output 1.** A series of **accessible spatial data layers** identifying a) critical habitat for dugongs, and b) dugong distributional “hotspots” some of which may be in existing Marine Protected Areas
- **Output 2. Recommendations for new Marine Protected Areas** (including trans-boundary protected areas), encompassing these critical dugong habitat and dugong hotspots.
- **Output 3. Models for the development of site-specific community-based dugong and seagrass conservation strategies** linking community-based stewardship and community-based natural resource management within the WIO.
- **Output 4. Management guidelines for responsible and sustainable resource-use** (including industrial resource-use) in relation to dugongs, seagrasses and associated ecosystem services within the Western Indian Ocean.
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Project expected outputs

- **Output 5.** Formation of a **regional Western Indian Ocean Dugong Working Group** to facilitate communication of dugong research and conservation within the Western Indian Ocean region.
- **Output 6.** A publication of the **genetic population structure** of East African dugongs (both within and across ocean basins).
- **Output 7.** A **re-assessment of the conservation status** of Western Indian Ocean dugongs under IUCN Sirenian Specialist Group criteria (Red data listing assessment).
- **Output 8.** A **threats listing for dugongs, locally and regionally and recommendations for the mitigation** of such threats to dugongs

Capacity building aspects of the project

- **1 PhD student registered at Pwani University (Kenya) - Mrs. Asma Hadi –**
- **1 Mozambican PhD student registered at Nelson Mandela Metropolitan University - Mrs. Alima Taju –**
- **One MSc student in Zanzibar (Institute of Marine Sciences) - Mr. Said Shaib**
- **PhD Research proposals approved in 2016**
- **Training of research teams on aerial survey techniques**



PhD student Alima Taju (left) administering by-catch questionnaire at Inhassoro



MSc student Said Shaib (in the middle) administering by-catch questionnaire in Pemba Island

Accomplished Activities

- Literature review completed
- Habitat hotspots identified and mapped– satellite images & ground truthing
- 916 Survey questionnaires and focus groups discussions carried out at Kenya (182 RA) ,Tanzania (694 RA), Zanzibar and Mozambique (140 CMS/ Dugong MoU)
- Acquisition and distribution of 12 acoustic loggers – 3 for Kenya, 3 for Tanzania and Six for Mozambique (long production and delivery process – 1 year – 2014-2015)
- Training workshop for use of acoustic loggers concluded in March 2016
- 1st deployment of acoustic loggers in Kenya and Tanzania (no calls recorded so far)
- Meetings with National Governments for policy and site specific management strategies initiated



Deployment of acoustic logger in Kenya and habitat assessment



And Tanzania mainland

Achieved Activities

- Distance sampling training workshops organized (In Kenya, Tanzania and Mozambique) in 2016)
- 1st set of Coordinated Aerial surveys carried out in November 2016 (Tanzania), December 2016 (Kenya) and January 2017 (Mozambique)
- Assessment of threats completed in Tanzania, Kenya and Southern Mozambique
- Improved collection of dugong mortality data and Inventory of available genetic samples .



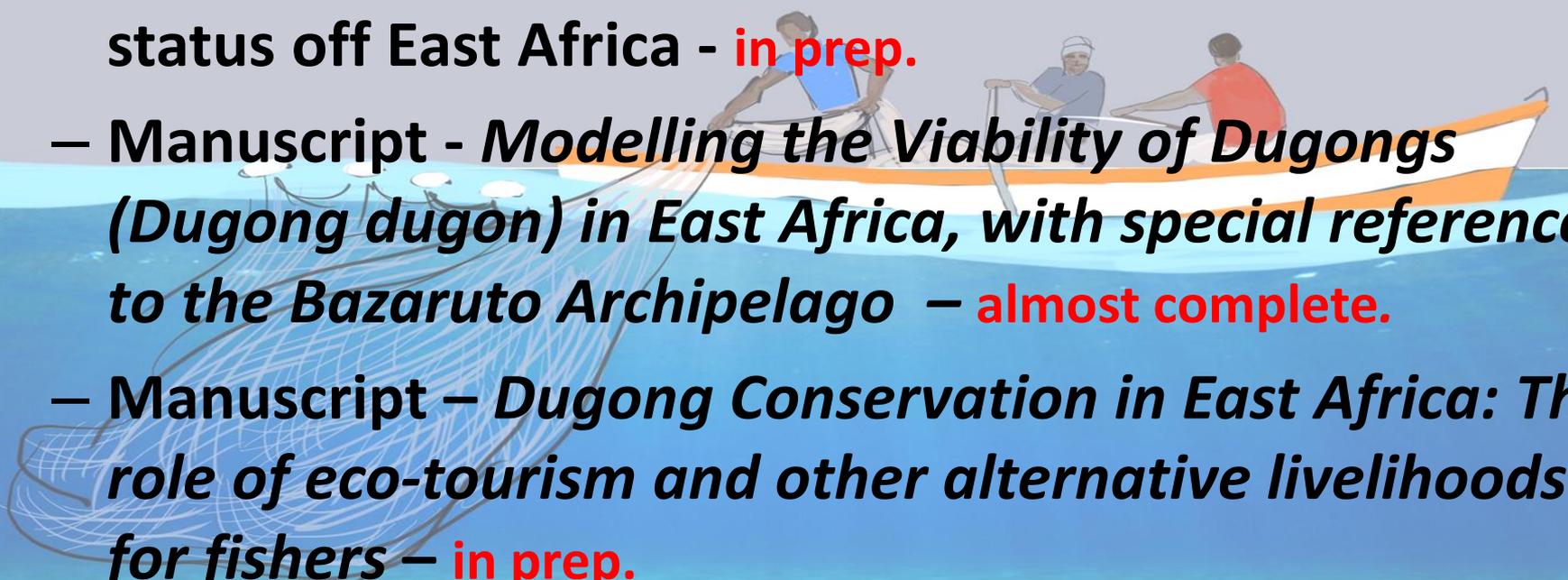
Distance training workshop
Tanzania



Stranded
Dugongs
recovered in
Moz in 2016



Publications produced or in preparation

- Literature Review and manuscript iro current dugong status off East Africa - **in prep.**
 - Manuscript - *Modelling the Viability of Dugongs (Dugong dugon) in East Africa, with special reference to the Bazaruto Archipelago* – **almost complete.**
 - Manuscript – *Dugong Conservation in East Africa: The role of eco-tourism and other alternative livelihoods for fishers* – **in prep.**
 - Draft Conservation and Management Plan (DMP) for Dugongs in Bazaruto – **prepared & submitted to NFC.**
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- An illustration of a small boat with three people on the water. The boat is white with an orange stripe. One person is in the front, one in the middle, and one in the back. A large fishing net is visible in the foreground, extending from the boat towards the bottom left. The background is a light blue sky and a darker blue sea.

Regional Progress

A large dugong is shown swimming underwater, viewed from above. The animal is white and has a yellow tag on its tail. The background is blue water with light rays filtering through.

- **Project team meeting held February 2016:**
 - **Confirm progress.**
 - **Address PC comments and formulate approaches.**
 - **Formulate future work guidelines, both research and impact**
 - **Input and advice provided by CMS/UNEP Dugong Secretariat.**
- **Data sharing agreement with BYCAM.**
- **Poster linking dugong, seagrass and coastal productivity in prep.**
- **New website DUGONGS.NET; linking all IAPs in East Africa in prep.**
- **Facebook page FRIENDS OF EAST AFRICA'S DUGONG live.**
- **Whatsapp Group of all East African role players set up in Feb. 2016 to aid communication (includes other NGOs and GEF project personnel).**
- **2 PhD students registered, projects approved.**
- **1 MSc. Student registered (project awaiting approval).**
- **Research summaries of PhD students submitted for publication in SIRENNEWS (newsletter of IUCN Sirenia Specialist Group)**
- **Workshops on DISTANCE sampling and LINE TRANSECT methodology to be held prior to aerial surveys.**

Planned activities until March (2018) and beyond

- **2nd Set of aerial surveys planed for late March- April in Kenya, Tanzania and Mozambique**
- **100 Survey questionnaires at Primeiras & Segundas and Quirimbas Archipelago (Mozambique)**
- **Deployment of acoustic loggers in Mozambique to start in April 2017 at BANP (outside cyclones and within fishing closed season) and north of Bazaruto**
- **Genetic study of dugong samples from East African (Moz and Kenya)**
- **PVA analysis of dugongs where data is available**
- **Dugong Management Plan in Moz to be discussed at technical government level (aligned with Dugong Seagrass Conservation Project)**
- **Site specific management plans re-evaluated for BANP (extension of Bazaruto National Park) , and to be prepared for Mafia Island & Rufiji Delta and Kenya**
- **Participation and oral presentation at WIOMSA Symposium in Tanzania (6 working papers in preparation)**
- **Final Project workshop in October 2017 in Dar –Es- Salaam in Mid October 2017**
- **Communication and dissemination of research results (to public) – beyond**

Thank you



The Western Indian Ocean Dugong Working Group
Vic Cockcroft (RSA); Lindsey West (Tanzania) Donna Kwan (Dugong MoU), Almeida Guissamulo (Moz), Asma Hadi (Kenya), Ken Findlay (RSA) and Said Shaib (Zanzibar)