



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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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.**



Regional Progress

- 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)