2ND INTERNATIONAL TRAINING COURSE ON

MANGROVE ECOSYSTEMS IN THE WESTERN INDIAN OCEAN REGION

COMMUNITY BASED RESTORATION, ADAPTATION, MANAGEMENT AND GOVERNANCE APPROACHES FOR MANGROVE ECOSYSTEMS IN THE WIO REGION

Center of Marine Sciences, Moana, University of Nairobi

17–28TH MAY 2016
Coastal ecosystems, including mangrove forests, provide an array of ecosystem goods and services that support the livelihoods of millions of people in the Western Indian Ocean (WIO) region via fisheries production, provision of timber & fuel wood, coastal zone protection and biodiversity habitat. Of the estimated global mangrove cover of 15.2 million ha, about 1 million ha are found in the WIO region. Mangrove forests in eastern Africa are in a relatively good state of health, however these spatially limited coastal ecosystems are under increasing global and local pressures, altering their composition, structure and function and their capacity to provide essential ecosystem services. To maintain healthy and vibrant WIO coastal ecosystems, an effective, long term and integrated protection, management and rehabilitation strategy is crucial. To achieve this there needs to be a strong focus on capacity development to generate necessary practical knowledge, skills and technical expertise on tools, methods and approaches to ecosystem based coastal and mangrove management.

With the support of WIOMSA-MASMA program, the United Nations University Institute for Water, Environment and Health (UNU-INWEH) along with regional and national agencies: WIO Mangrove Network (WMN), Kenya Marine and Fisheries Research Institute (KMFRI), Wetlands International, The Coastal Oceans Research and Development - Indian Ocean (CORDIO), the IUCN ‘Resilient Coast Initiative’, University of Nairobi, Institute of Marine Sciences (IMS) of the University of Dar es Salaam, Nairobi Convention and the World Wide Fund for Nature (WWF) ‘Coastal East Africa Initiative’ (CEA-NI), is coordinating an initiative for monitoring, research and conservation of mangrove forests through training in scientific methodology and approaches for integrated management of coastal ecosystems. This exercise is based on a successful capacity development initiative held annually by Annamalai University in India for past fifteen years (http://inweh.unu.edu/mangroves-course/). The program is also supported under UNU-INWEH’s global scale capacity building framework ‘Ecosystem Based Adaptation approach for Sustainable Management and Governance of Coastal Ecosystems (ENGAGE)’ that aims to create a network of professionals or community of practice advocating for mangroves at all levels.

This second regional training program follows the successful completion of the first course held at the University of Nairobi’s field station in December 2013 (http://inweh.unu.edu/mangrove-wio-region/) wherein 24 people from 8 different countries participated. The program fits in the objectives of the UNEP Nairobi Convention (1996) for the protection, development and management of coastal and marine resources in the WIO region and is designed to underline regional priorities, to enhance regional capacity on ecosystem based approaches and tools for the rehabilitation, conservation and sustainable utilization of mangrove resources and develops capacity on multiple dimensions of integrated approaches for Mangrove Ecosystems Management. In addition to support the objectives of the regional initiative- WIO Mangrove Network (established in 2012) that has strategic goals of knowledge exchange, active dialogue, and enhanced regional capacity in the field of mangroves and their management.

For the course outline, refer to Annexure 1
The training venue will be at the University of Nairobi’s Center of Marine Sciences Center of Marine Sciences, Moana, University of Nairobi.

Candidates should be involved in protection, management and restoration of coastal ecosystems i.e. managers and personnel from institutions and industry experts involved in coastal management. It is expected that participants should have a bachelor’s level education or comparable experience in a management agency, academic institution or a non-governmental organization. Selection criteria for participants include:

- Nationality in a developing country which is preferably from the WIO region
- Relevant academic background (coastal and marine issues), or relevant work experience
- Proficiency in English
- Institutional connections, such that, the trainee will ideally be able to replicate the training in his/her work
- Some research experience is preferred
- Justification for receiving a fellowship
- Letter of support from the employer or supervisor

A limited number of fellowships are available for qualified candidates from WIO countries. These fellowships will be granted on a competitive basis and will cover all expenses, including economy excursion airfares via the most direct route for candidates from outside Kenya. Candidates from Kenya will be covered for travel via the most direct route.

Age, Gender and Youth representation will be duly considered during selection.

Geographical balance will also be taken into account.

For inquiry via UNU-INWEH, contact the program coordinator:

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For inquiry via regional node, contact the regional coordinating team.

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Application forms can be sent via email or by sending hard copies by 20 March, 2016 to:

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**View Application:** [http://bit.ly/1OXCM38](http://bit.ly/1OXCM38)  (PDF)

**Please Note:**

Emails must have “Mangrove Ecosystems In The Western Indian Ocean Region” in the subject line

Late Applications will not be considered.

Due to the high number of applications only successful applicants will be contacted.


ANNEXURE 1 - COURSE OUTLINE

The training course is a 10 day program, this includes arrival and departure and one rest day. The sessions are a mix of theoretical lectures, case study presentation by the candidates, group exercises and discussions.

DAY 1 - Coastal and Mangrove Ecosystems – Introduction

- The ecology and biology of coastal and mangrove ecosystems
- Occurrence, distribution, diversity and importance of mangroves
- Overview of status and threats to coastal and mangrove ecosystems - global, regional, national
- Environmental significance of coastal and mangrove ecosystems
- Ecological services and benefits of coastal and mangrove ecosystems
- Ecological connectivity and interaction with other biota

DAY 2 - Coastal and Mangrove Ecosystems in a Changing Climate

- Climate change impacts on coastal ecosystems and mangroves
- Role of coastal ecosystems and mangroves in carbon cycle and climate change
- Carbon accounting in mangroves (Blue Carbon Theory and Concept)
- Natural disasters and system-based natural disaster risk reduction (Eco-DRR)
- Tools and methods for increasing the resilience of these ecosystems to global change
- Mitigation and adaptation measures
- Climate change resilience
- Vulnerability and risk reduction strategies
- Carbon markets and carbon financing options
- Discussion Session

DAY 3 - Coastal and Mangrove Ecosystems, assessment and monitoring methods – First Field session at Gazi Bay

- Demonstration of baseline sampling and setting up a monitoring program
- Demonstration and use of sampling equipment
- Field demonstration on vegetation characteristics of mangroves
- Demonstration of mangrove biodiversity assessment methods
- Field demonstration of assessing climate change impacts (risk and vulnerability assessments)
- Mangrove carbon sampling methods
- Visit to Community and ecotourism initiative (Mikoko pamoja, boardwalk) (exercises for social and economic assessments etc.)

DAY 4 - Management of Coastal and Mangrove Ecosystems

- Integrated Coastal Zone Management (ICZM)
- Ecosystem based management approaches
- Marine Spatial Planning (MSP)
• Climate compatible development
• Marine Protected Areas
• Sustainable Use (fisheries, aquaculture, silviculture)
• Mangrove Ecotourism
• Ecosystem services evaluation and payments- relevance for mangrove ecosystems
• Community based management approaches, alternative livelihoods, property rights, tenure issues
• Community-based approaches applied to the WIO region
• Presentation of Case Studies and lessons learned (approaches in India, Panama, Kenya, Senegal, Philippines and Indonesia)
• Discussion Session

**DAY 5 - Conservation, Management and Protection Tools – Second Field session at Ngomeni Bay (Kilifi county)**

• Visit site to showcase different conservation issues and human induced threats to mangroves and other coastal ecosystems (e.g. timber exploitation, salt mining, agricultural influence, pollution, development)
• Visit sites with climate change impacts (impacts of waves/storm surges/sea, level rise (erosion/loss/damage)
• Visit local community initiative

**DAY 6 - REST DAY**

**DAY 7 - Application of Remote Sensing & GIS for Resource Assessment**

• RS and GIS Application in Mangrove Resource Assessment & Management
• RS and GIS Application in disaster and climate change risk and vulnerability assessment & management
• RS and GIS Laboratory (Practical)
• Discussion Session

**DAY 8 - Mangrove Restoration and Afforestation Tools**

• Introduction and reasons for restoration and afforestation
• Concepts and tools for restoration, afforestation, flow restoration in Mangroves
• Natural Regeneration/Artificial Regeneration/Mono culture
• Ecological mangrove restoration (EMR Method)
• Steps for mangrove restoration (and afforestation)
• Functionality of restored mangrove forests
• Ecosystem Based Disaster Risk Reduction and Adaptation Strategies
  o Ecosystem based disaster risk reduction (Eco-DRR)
  o Ecosystem based adaptation (EBA)
• The role of mangroves in reducing risk from natural coastal hazards
  o Mangroves and wave attenuation
  o Storm surge reduction
  o Tsunami impact reduction
  o Mangroves, erosion reduction and shoreline stabilization
  o Mangroves and sea level rise
• Building with Nature solutions ad Green infrastructure
  o Hybrid coastal defense approaches
  o Managed realignment
• Other risk reduction strategies
  o Early warning and preparedness
  o Vulnerability and risk assessments
• Overview and analysis of gaps and policy hurdles for sustainable management and needs for policy reforms
• Recap of training course, evaluation and focused group discussion
• Plan of Action for improving research, training and management in the WIO region, primarily focusing on Ecosystem Based Adaptation approach for Sustainable Management and Governance of Coastal Ecosystems (ENGAGE)

Day 9 - Mangrove Restoration and Afforestation Tools - Third Field Session – Gazi Bay

• Field visit to nursery and restored mangrove area areas
• Field demonstration of different mangrove restoration methods
  o Demonstration of Vegetative Propagation Techniques
  o Field demonstration of methods for replanting stands and plantation exercise
• Field demonstration of site selection methods
• Demonstration of community based methods (visit community)
• Demonstration of integrated aquaculture (failed example)
As a PhD student the course allowed me to meet the famous and devoted people (academic cadres of universities) working in the field of mangrove ecosystems that have provided to me a better orientation towards my studies.

The field work provided huge opportunities to understand the different field techniques to study mangrove ecosystems. Based on that experience, my Commission is now experimenting plantation of Avicennia Marina spp which is found to be better adapted to the low rainfall on the island and my department initiated training for the coastal community on the importance of mangroves’ ecosystem.

Henri FELICITE [Rodrigues Island, Mauritius]

Somalia has the longest coastline in Africa with no management regime for coastal ecosystems. The country is currently emerging from more 20 years of civil conflict and needs capacity building in coastal ecosystems management than any other country in the region since government institutions are just. As a participant in the training in 2013, I have managed to utilize the skills and knowledge from the course to develop a research project “Economic valuation of coastal fisheries in Kwale county, Kenya” for my Master’s degree in Environmental Planning and Management. I am now working with UNDP, Somalia as a Project Officer (Environment & Energy).

Abdirizak Hassan [Somalia]

We have a lot of ongoing efforts to manage mangrove ecosystems and for ICZM and MSP in Kenya. However the expertise available is insufficient to cover the entire span of the coast, thus more capacity is needed. Through the course and the associated field trips I got more exposure to practical aspects of mangrove conservation and management. I used this knowledge and previous experiences to formulate a mangrove conservation project at my workplace, which was very successful. For me the course was also a great boost to me to begin the processes for pursuing my PhD dream in mangrove conservation and management.

Preetika [Wetlands International Kenya]

I strongly think that my country (Kenya) needs capacity for managing Mangrove Ecosystems, Integrated Coastal Zone Management (ICZM) and Marine Spatial Planning (MSP). I made the study material shared during the training also available to my colleagues teaching courses in marine science. I especially liked to engage the students in discussions about the carbon markets which have benefited the environment but also the communities as we saw in Gazi!! Thank you for the opportunity to get this experience and also meet with participants from other countries and learn how the manage their systems as well. I look forward to a similar experience in the future.

Pauline Macharia [Kenya]