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Ecosystem Services Valuation of mangrove forests in Zambezi delta under the Blue Forest Initiative and Sustainable Financing of Protected Areas of Mozambique

WORKSHOP REPORT



With collaboration of



Quelimane, 3th October 2016

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1. Workshop Background and Objectives

In the course of the preparation for the implementation of the project of the **Ecosystem Services Valuation of mangrove forests in Zambezi delta under the Blue Forest Initiative and Sustainable Financing of Protected Areas of Mozambique**, an inception meeting with the relevant stakeholders was held in Quelimane, in the 30th September, 2016.

The meeting aimed at building a common understanding, amongst the stakeholders, on the need to conduct a scientific-based assessment of mangroves ecosystem services as a requirement tool to support conservation and foster sustainable management of mangrove forests. The meeting agenda is presented in annex – I. It is expected that the meeting will contribute to mobilize support for an active engagement of the stakeholders in providing relevant information for the success of the study. Hence, during the meeting the participants will be briefed and share views about:

- The importance of mangrove in the livelihood of people and in sustaining the ecosystems and the associated natural resources;
- Market and non-market value of mangroves;
- Issues hampering the sustainable use and exploitation of mangroves;
- Background justification for the assessment study;
- Study objectives, scope, methodology, result and expected outputs
- Partners to be involved during the study

2. Workshop Outcomes

Through this workshop is expected that participants will contribute to:

- improve and clearer the definition of the objectives, goals and methodology of the study;
- identify additional sources of data and information relevant to the study;
- improve on the strategy to engage stakeholders at the local level, particularly those to be involved in the interviews;
- Improve on the sites to be surveyed and stakeholders to be involved

3. Workshop participants

The meeting convened 20 experts in was attended from different sectors of society directly and indirectly involved and interested in mangrove use, harvesting, conservation and management, and those interested in studying mangrove ecosystems, as follows:

- Representative of the WWF WCO, the main promoter;

- Representative of the School of Marine and Coastal Sciences, the implementing institution;
- Government institutions (Environment, Fisheries, Forestry, Agriculture, Science and Technology, Higher Education) at the provincial level;
- Academic institutions based in Quelimane;
- Private sector (Fisheries, Aquaculture, Agriculture, Forestry);
- Civil Society (Association of Artisanal Fishermen, Community Based Organisations).

The participant list is presented in annex – II. The workshop started with an overview of recent work on mangroves, showcasing case studies in Quelimane, Zambezia on mangrove reforestation, mapping analysis and status.

4. Opening Statements

Representatives from the Government of Mozambique, Superior School of Marine and Coastal Sciences and Worldwide Fund for Nature Mozambique Country Office

During the opening statements the Director of the School of Marine and Coastal Sciences of the Eduardo Mondlane University, *Professor António Hogueane*, welcomed the participants, thanked the fact that they came to attend the meeting, showing the importance they give to the issue of economic assessment and conservation of mangrove. After a brief introduction of the participants, individually, he presented the objectives the expected result of the meeting.

Ms. Denise Nicolau on her opened remarks informed the participants about the WWF MCO efforts towards biodiversity conservation, both terrestrial and marine. She explained the national and regional programme structure and initiatives on conservation of biological diversity. She informed about the project of conservation involving the local community they are implementing in national reserve parks of Quirimbas, Bazaruto and Zambezi delta.

The Provincial Director of Land, Environment and Rural Development, *Mr Diogo Borge Davide* on his opening speech, attached as annex – III in the present report, stated that the major stands of mangroves in Africa are in the Eastern African Coast, in Kenya, Mozambique and Tanzania. The other African countries with considerable stands of mangrove forest are Nigeria, Madagascar, Guinea and Cameron. He reiterated the importance of mangroves in the livelihood of many Mozambican people living in coastal zones through direct harvesting of mangroves and through the resources which availability depend on mangroves, and the importance of mangroves in protecting the coast and in regulating the climate. He expressed the concern of the government regarding the observed destructions of mangrove forests and informed the participants the government efforts in supporting the restoration initiatives and establishes policies and enforces Law towards conservation of mangrove

forest. He recognised, however, that we should not simply prohibited the people to harvest mangrove, since it is their means of subsistence, we should rather provide alternative livelihood. He indicated the government challenges regarding the conservation of mangroves as follows:

- Monitoring and controlling mangrove exploration, since they are distributed in a vast extensive area of difficult access;
- Mangrove reforestation thoughtfully is rather trick and expensive activity;
- Awareness campaigns in the rural communities to explain about the importance of mangrove and the need for their conservation;
- Identification of alternative livelihood to mangrove harvesting.

He said that the present initiatives on aiming to assessment of the socio-economic value of mangroves would add evidences that would strengthen the case for mangrove conservation. However, he advised that the study should not limit to providing economic value but should advance and identify sustainable alternative livelihood to mangrove harvesting.

5. Mangrove Initiatives in Quelimane, Zambezia and mangroves importance

6. Status of mangroves in the Bons Sinais Estuary

Presentation of Eng. Joana José, SSMCS

Ms Joana José, a forester engineer specialized in mangrove forestry, a senior lecturer and research and head of the Centre for Integrated Coastal Management Studies at the School of Marine and Coastal Sciences of the Eduardo Mondlane University made a presentation on the evolution of mangrove forestry cover in the Bons Sinais in the period 1990-2014, as a case study. Her full presentation is available in the link “Estado de conservação do mangal dos Bons Sinais” http://awsassets.wwfmcz.panda.org/downloads/ecologic_importance_of_mangroves.ppt.

Her study indicated that during the 24 years period while there were 1,825 ha of new mangrove the degraded area was 3,243ha, meaning a deforestation rate of 59ha per year. Due to the fact that the mangroves area are located in the vicinity of a large city, the Quelimane city, the cause of degradation were associated to high demand for building material, faire hood, land for settlement and often due to the fact that most of the mangrove areas are used as solid waste dumping sites. In addition, mangroves were cleared for salt pans and establishment of a large shrimp aquaculture farm. She reiterated the fact that restoration of mangrove is a difficult task since they are few species and develop under restrict conditions, combining tides, river flow, salt and fresh water, and a right salt balance

and flow stress should be maintained for the mangrove to develop, unlike terrestrial forest which is relatively ease to establish enabling environment for plants to grow.



Figure 1. Workshop participants.

The participants indicated that some of the mangrove poles and firewood sold in Quelimane are obtained from mangrove in the vicinity of Chinde, where the proposed assessment is to be conducted. They pointed out that the depletion of mangroves near the cities is in part exacerbated by people who migrated from rural areas to the urban areas looking for better livelihood. Hence, the need to address the issue of migration from rural area to the cities. They urged the urgent need to identify and address the causes of mangrove depletion. Further, they reiterated the urgent need to adopt policies that can prevent the degradation and foster conservation initiatives.

7. Mangrove restoration activities

Presentation of dr. Bonifácio Manuessa, SSMCS

Mr Bonifácio Manuessa, from the School of Marine and Coastal Sciences of the Eduardo Mondlane University, presented the project of mangrove reforestation in Mirazane, in the vicinity of Quelimane. The work is being undertaken with technical support of the School of Marine and Coastal Sciences of the Eduardo Mondlane University, with the involvement of local community and funded by USAID. His fully presentation is available through the link “[Reflorestamento do mangal no Estuario dos Bons Sinais](http://awsassets.wwf.mz.panda.org/downloads/mangrove_restoration_program.ppt)” http://awsassets.wwf.mz.panda.org/downloads/mangrove_restoration_program.ppt. The project aims at reforesting 20ha of degraded mangrove. They established a mangrove nursery with a capacity to produce about 40,000 plants. *Mr Bonifácio* explained about the difficulty they faced in replanting mangrove in the field, mostly due to the high solar radiation which led to excessive salt. In order to reduce this effect they planted mangroves along vales to retain water.

The discussions were about the techniques to replant mangroves. The representative from RADEZA, an NGO devoted to community development, informed about mangrove reforestation activity they are promoting in different places in Zambezi Province. The Secretary of Incidua, another suburb of Quelimane benefiting from mangrove, mentioned that the community is aware about the importance of mangroves; hence, they are actively engaged in mangrove forestation. He said that the degradation of mangroves is often carried out by people from remote area, and not by people in the vicinity of mangroves. He also mentioned that the lack of alternatives for livelihood, firewood and building material are among the causes of mangrove degradation. The director of Land, Environment and Rural development, shared his experiences in planting mangrove in Beira, and suggested that the valleys to retain water could be placed randomly and call the attention to observe the ideal spacing.

8. Ecosystem value of mangroves

Presentation of Professor António Hogueane

Professor António Hogueane from the School of Marine and Coastal Sciences of the Eduardo Mondlane University made a presentation about the socioeconomic value of mangroves. His presentation is available on the link “Valor ecológico do mangal” http://awsassets.wwfmz.panda.org/downloads/ecologic_importance_of_mangroves.ppt . Based in the studies made by the School of Marine and Coastal Sciences in the Bons Sinais Estuary he showed that mangroves are a source of nutrients to the adjacent seas and a sink of pollution, contributing in that way to the productivity and maintenance of water quality in the coastal waters. He stated further that the study indicated that the pristine mangrove contributed in carbon sequestration of the order of 200 ton km⁻² of mangrove area, while the degraded mangrove contributed by a half of that, 100 ton km⁻² of mangrove area. The artisanal fisheries production, which depends on mangrove ecosystems, in the central and northern Sofala Bank, was said to be of the order of 15,000 tons per year, excluding the semi-industrial and industrial and catches. He presented the common species captured and described briefly their ecology to show their linkage with the mangrove ecosystems.

The participants showed to be well aware of the ecological importance of mangroves, and reiterate the need to identify the alternative livelihood to direct mangrove harvesting and foster conservation initiatives.

9. Challenges for sustainable use of mangroves and the need for economic assessment of mangroves

Presentation of Professor António Hogueane

Professor Hogueane then presented what he considered the main challenges to sustainable use of mangroves in Mozambique, where he pointed out the poverty and the struggle for subsistence from natural resources, being mangrove the easy affordable resource. His presentation is available through the link “Desafios para uso sustentável do mangal” http://awsassets.wwf-mz.panda.org/downloads/sustainable_use_of_mangroves.ppt

. He identified the major causes of mangrove degradation the harvesting for firewood, charcoal and building material, and he said that settlement, salt production, aquaculture and solid waste dumping is an issue of concern near the urban areas. He identified the commonly applied conservation friendly income generating activities Mozambique being the fisheries, crab and mussel collection, and honey production.

Based in the studies made in different places, obtained from literature, structured the use and benefits of mangroves in two categories: (a) one that is based in destructing mangroves such as building material, firewood, charcoal, aquaculture, salt production and the other (b) which is based in conserving mangrove such as fisheries, aquaculture in cages in tidal creeks, honey production, medicine plants and ecotourism. He mentioned that often the direct harvesting of mangroves is easy and accessible to low income people as it does not require capital investments. Further, he said that the estimate of the economic benefit from the activities that requires the destruction of mangroves is straightforward compared with the estimate of the economic value of the indirect benefits from mangroves, which makes it difficult to demonstrate and convince that mangroves can provide more and in sustainably way if conserved.

He presented the objectives of the current studies, which is the estimate of the socioeconomic value of the mangrove, the methodology and data required, and pleaded the stakeholders present to cooperate in the provision of data and information required for the successful of the study. He reiterate the importance of the study to the conservation of the mangroves and hence, to suitability of the associated resources.

The participants welcomed the study and looked forward to the figures of the economic value of mangroves in the country. However, they repeatedly noted that the study should not limit to the evaluation of the economic value of mangrove and strongly requested that should advance and propose alternative livelihood and income generating activities to the direct harvesting mangroves. The representative of Aquapesca, the shrimp aquaculture farm, suggested that new and innovative aquaculture techniques apart from digging ponds should be identified, tested and applied.

10. Key Findings of the Workshop

- Mangroves are critical habitats for conservation and they provide several ecosystem services for local communities in Mozambique;
- Changes are already felt on many fronts and affect long term availability of mangroves and its ecosystem services;
- Critical interventions are required to promote sustainable use of mangroves;
- Highly recommended to include cultural benefits and local context on mangrove management;
- Crucial to engage with local Government, CSOs and local communities in order to promote the use of innovative technologies to secure long-term benefits from mangroves;
- Crucial to understand local value/costs (\$) of mangroves reforestation programmes, build up on existent work conducted by UEM in Quelimane;
- Use the results from the current study to unify voices for mangroves conservation and inform at local/national level Government to advocate improved methodologies for mangrove management.

11. Concluding Remarks

The meeting was successfully held, and in particular, the participants requested that the study be expanded to provide the alternative and sustainable livelihood to direct mangrove harvesting. Further, the participants mentioned the need to conduct studies on the alternative income generating activities to retain youth in the rural areas. They promised to collaborate and provide the information and data required. The fisheries sector will provide historical data about fisheries and the Directorate of Land, Environment and Rural Development will provide support allocating a technician to join in the field trip, he will be responsible to liaise with the district authorities. The Director of Science, Technology, Higher Education and Vocational Training recommended involving the teachers and students from the secondary school in the surveys in order to secure the transmission of knowledge and capacity building at local level.

12. Closing Statements

During the closing ceremony, *Professor Hoguane*, thanked the participants and the contributions which, he said, strengthened the project, and promised to come in February 2017, to a meeting to present the result of the study.

Ms Denise Nicolau, also thanked the participants and valuable contribution provide and looked forward to the result of the study.

Mr Cardoso Meque, the Provincial Director of Science, Technology, Higher Education and Vocational Training, on his closing statement reiterate the fact that the present government puts science and technology as the basis for policy development and decision making. He welcomed the study and said it falls in the government policy to guide the development. He reiterated the need for the study to provide ecologically and economically sustainable alternative livelihood do mangrove harvesting and conversion. He urged the need to identify alternative sustainable aquaculture practices apart from digging ponds in mangrove. He pleaded to involve secondary teachers and students in the surveys and in conducting inquires in the local communities, as means to build local communities and to ensure ownership by the local education institutions. He looks forward to the result.

Annex I - Meeting Agenda

Period	Activity	Responsible
08:30-09:00	Registration	Protocol
09:00-10:00	<p>Introductory plenary session</p> <p>Intervention of the Director of The School of Marine and Coastal Sciences – Prof A.M.Hoguane – welcome note and meeting objectives</p> <p>Intervention of the Representative of WWF MCO – Ms Denise Nicolau - The WWF MCO and mangrove conservation initiatives</p> <p>Intervention of the Provincial Director of Land, Environment and Rural Development, Mr Diogo Borge Davide – The Government interest and initiative towards conservation of mangrove</p>	Prof. A.M.Hoguane
10:00-10:30	Tea/coffee break	Protocol
10:30-12:00	<p>Plenary session – the need for a socio-economic assessment of mangroves</p> <p>The state of conservation of mangrove in the Bons Sinais Estuary (Ms Joana José)</p> <p>The project of mangrove restoration in the Bons Sinais Estuary (Mr Bonifacio Manuessa)</p> <p>Ecosystem value of mangrove (Prof A.M.Hoguane)</p> <p>Challenges facing sustainable use of mangrove forest and the need for a scientific based assessment of the socioeconomic value of mangrove - The assessment study objectives, methodology, data and information needed and expected results (Prof A.M.Hoguane)</p> <p>Plenary discussion (facilitated by Prof A.M.Hoguane)</p>	Prof. A.M.Hoguane
12:00-12:30	<p>Final remarks</p> <p>Director of The School of Marine and Coastal Sciences – Prof A.M.Hoguane</p> <p>Representative of WWF MCO – Ms Denise Nicolau</p> <p>Closing statement by the Provincial Director of Science, Technology, Higher Education and Vocational Training, Mr Cardoso Henriques Meque.</p>	
12:30-13:30	End of Workshop and Lunch	Protocol

Annex – II – List of participants

ENCONTRO DE AVALIAÇÃO DOS SERVIÇOS ECOSISTÉMICOS DAS FLORESTAS DO MANGAL DO DELTA DO ZAMBEZE, NO ÂMBITO DA INICIATIVA GLOBAL
 – BLUE FORESTS
 (Quelimane, 30 de Setembro de 2016)

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REPÚBLICA DE MOÇAMBIQUE
GOVERNO DA PROVÍNCIA DA ZAMBÉZIA
DIRECÇÃO PROVINCIAL DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL

Proposta de Intervenção do Senhor Director Provincial da Terra, Ambiente e Desenvolvimento Rural da Zambézia por ocasião do encontro de Avaliação dos Serviços Ecosistémicos das Florestas do mangal do delta do Zambeze, no âmbito da iniciativa Global – Blue Forests

- **Exmo Senhor Director da Escola Superior de Ciências Marinhas e Costeiras;**
- **Exmo Senhor Representante da WWF;**
- **Exmo Senhor Representante da UEM;**
- **Exmos Senhores Representantes das instituições do Governo Provincial**
- **Senhores Representantes das ONGs**
- **Senhores Representantes da sociedade civil**
- **Ilustres Participantes e Convidados,**
- **Minhas Senhoras e Meus Senhores**

Em nome da Direcção Provincial da Terra, Ambiente e Desenvolvimento Rural da Zambézia e em meu nome pessoal, desejo boas vindas a todos os participantes neste encontro de Avaliação dos Serviços Ecosistémicos das Florestas do mangal do delta do Zambeze, no âmbito da iniciativa Global – Blue Forests e faço votos que se sintam bem acolhidos na nossa Província.

É uma grande honra e privilégio para nós, acolher um evento tão importante como este, que pela primeira vez se realiza na nossa Província.

Caros Participantes

Ao nível do continente africano, as maiores florestas do mangal encontram-se no Quénia com uma área de 96.000 km², Moçambique, com 85.000 km² e Tanzânia, com 45.000 km². Estima-se que cerca de 70% de toda a área do mangal do continente africano está em cinco países nomeadamente, a Nigéria, Moçambique, Madagáscar, Guine e Camarões.

Em Moçambique, os mangais ocorrem do Rovuma ao Maputo, ao longo de toda a costa e as maiores florestas do mangal localizam-se nas províncias da Zambézia e Sofala com 155.757 hectares e 125.317 hectares respectivamente.

Nos últimos anos, as florestas do mangal na Província da Zambézia, têm vindo a registar um elevado índice de desmatamento, facto que acelera a sua destruição, causada pelo crescente aumento da população, as inúmeras dificuldades económicas que se fazem sentir no seio da população fazem com que esta recorra ao mangal para a extracção de alguns recursos como forma de garantir o auto sustento, trazendo como consequência, a sua devastação.

Apraz-me referir que as florestas do mangal desempenham um papel fundamental na sustentabilidade do meio ambiente natural e humano, criam condições para o desenvolvimento de habitats favoráveis à fauna, contribuem também para a manutenção da biodiversidade.

Neste contexto, espero que este encontro, traga soluções para que a Província da Zambézia em particular e o País no geral, consiga preservar este preciosíssimo ecossistema através do estabelecimento de estratégias com vista a minimizar os efeitos negativos que lhe são causados aproveitando a abordagem do sequestro de carbono.

Minhas Senhoras e Meus Senhores;

No que diz respeito à destruição do mangal, a Província da Zambézia tem como principais desafios os seguintes:

- Privilegiar e intensificar a fiscalização da exploração do mangal;
- Estabelecimento de viveiros do mangal e sua reposição.
- Sensibilização e consciencialização das comunidades locais sobre os mangais;
- Fazer estudos para encontrar produtos alternativos que possam minimizar a pressão sobre o mangal e que tenham aderência nas comunidades locais.

Na busca de soluções para os problemas que afectam as florestas do mangal, a Província da Zambézia está a privilegiar a sensibilização das comunidades locais e a recuperação das áreas degradadas com o envolvimento destas. Estas iniciativas vão, por um lado, contribuir para a sustentabilidade do mangal e, por outro, melhorar a qualidade de vida das populações rurais, contribuindo por sua vez para os esforços do Governo na luta contra a pobreza.

Por último, quero saudar a Universidade Eduardo Mondlane e a Escola Superior de Ciências Marinhas e Costeiras e em particular a WWF por terem escolhido com carinho a nossa Província, para a realização deste encontro.

Desejo a todos uma frutuosa partilha de opiniões e uma participação dinâmica para que os objectivos definidos para este encontro, sejam de facto alcançados.

Bom trabalho a todos e sucessos nos debates.

MUITO OBRIGADO

Quelimane, aos 30 de Setembro de 2016