

# POLICY BRIEF

September 2019

## MANGROVE DEGRADATION; REVERSING THE TREND THROUGH COMMUNITY ENGAGEMENT



### **Mangrove forests: an important natural resource supporting animal and human coastal communities**

Mangrove forests in Kenya cover approximately 61, 271 hectares (ha) in a 536 km long coastline supporting the livelihood of approximately 3million Kenyans along the Kenyan coast. Lamu County coastline accounts for 61% mangrove forest cover (GoK, 2017) while Mombasa and Kwale account for the remaining 29%. Here, they protect the shoreline and provide habitats for marine fish and other marine organisms that are a source of food. Mangrove trees play an important role in the ocean environment,providing a shelter for marine sea fishes and other organisms to grow and reproduce. The trees are also utilized by communities as wood for house construction, boat building and making of furniture. They are



*Mangrove forest*

also a source of medicine, dye, firewood, charcoal and fencing poles. Mangrove forests are also very important in protecting the shoreline from erosion and excessive damage by floods, hurricanes and tsunamis. Thus, they are critical in sheltering and maintaining habitats and breeding grounds vital for growth, survival and reproduction of marine animals and fishes. The trees also purify the air we breathe by absorbing carbon dioxide from the atmosphere. Increase in levels of carbon dioxide lead to destruction of the layer of oxygen up in the sky which plays a role in reducing the amount of heat from the sun reaching the earth's ground. When too much heat reaches the earth's ground, it contributes to rise in global environmental temperatures and unpredictable weather patterns. This causes an increase in water evaporation, prolonged droughts, unusual heavy rains, floods, hurricanes and tsunamis being experienced in different parts of the world.

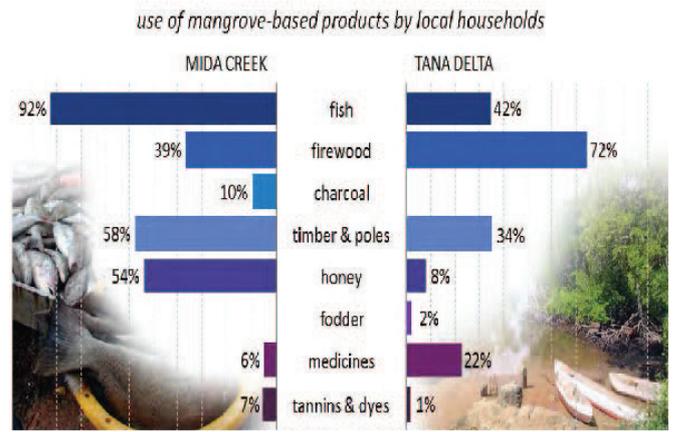
### Mangroves: A vital economic resource

Approximately 3 million people in four counties along the Kenyan Coast rely directly or indirectly on mangroves. Mangrove forests are a refuge and home for marine fish and other marine organisms of economic importance such as crabs, shrimps, prawns, molluscs, oysters among others. More than 3000 fish species are found living, sheltering and breeding in the mangrove forests ensuring their growth, survival, reproduction.

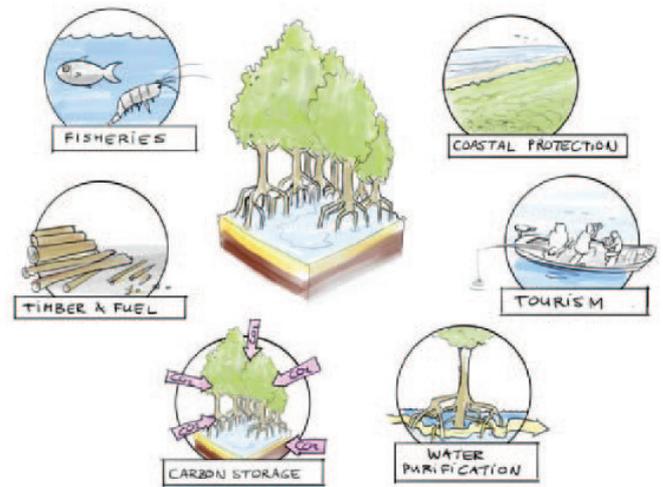
Marine fishing is an important economic activity and sometimes the only income earner supporting livelihoods of coastal people. Kenya produces 8 000 tons of marine fish generating KES 100 million annually and contributing approximately 0.5% of all the goods and services produced in the country (GoK, 2010a). Marine fish is also an important major protein source for inland and coastal communities. Destruction and clearance of mangrove forests through logging and over harvesting threatens the survival of these 3000 marine fish species, directly contributing to decline in fish numbers, loss of

### Mangrove destruction on the increase; the consequences are bad

Human population continues to increase over the years. The Kenya population census, 2009 reported a total coastal human population of 3,040,650 million (GoK, 2017). This population size has led to an increase in demand for fish and over-exploitation of mangrove forests for firewood, construction materials and other resources. In addition to human causes of mangrove destruction, coastal communities have a preference for certain mangrove types because of their likeable attributes and suitability of certain species for specific purposes. For example for construction wood, coastal people prefer specific tree types leading to the over-harvesting and over-exploitation of three popular and



Use of mangrove-based products by households in Kilifi and Tana Delta counties (FAO and UNEP, 2016)



vital income and lack of much needed protein source resulting in malnutrition and food insecurity. Thus, mangrove degradation directly affects inshore and offshore commercial fisheries through lack of food and loss of shelter and breeding grounds for most fishes. Worldwide this translates to loss of KES 160 billion each year in environmental services and support of coastal livelihoods. In Kenya this means a loss of KES 582 million every year for inshore fisheries within the mangroves.

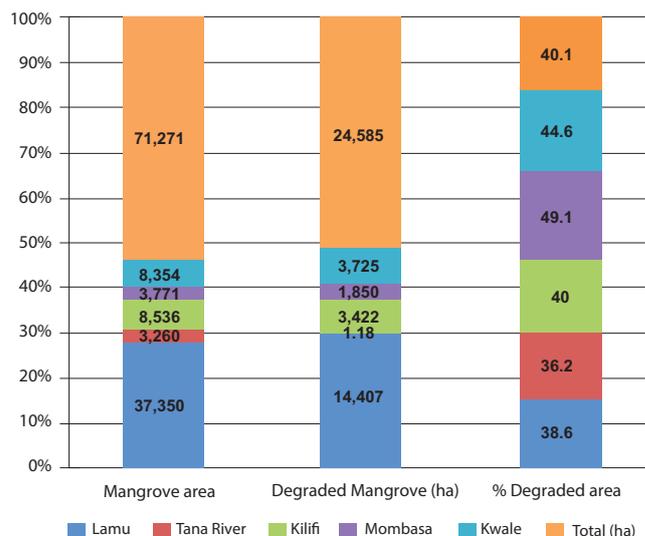


A section of destroyed mangroves in Lamu (Photo by Tony Karumba, 2017)

preferred mangrove types. This is the main reason for cutting of specific species of mangroves at the Kenyan coast.

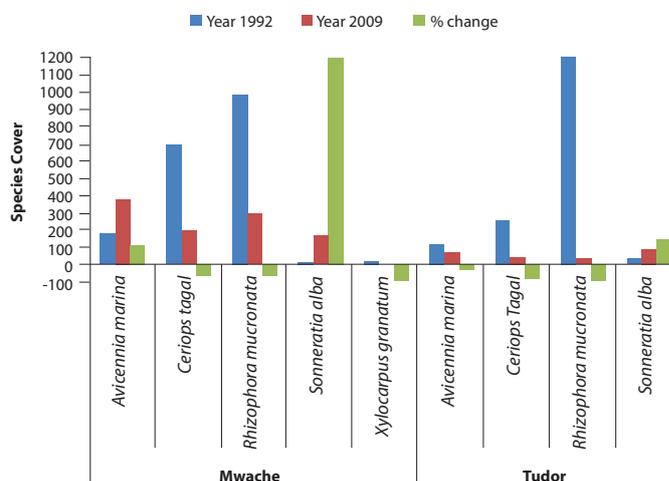
Mangrove forest cover loss of 20% (450 ha/year) was recorded between 1985 and 2009 of which Mombasa experienced a 70% mangrove cover loss as a result of human factors. This has been estimated at 1-2% loss per year (Bosire et al., 2013). This puts coastal people who directly rely on mangroves trees for various needs and marine fish for food and income at risk of losing their livelihoods and experiencing increased poverty levels. This is likely to escalate if this mangrove destruction is not adequately addressed and completely stopped. Thus, in order to achieve the highly ranked economic and social benefits from mangrove forests as well as sustainable marine fishing and overall economic growth which is key in human development in at least five counties in Kenya, mangrove destruction should be stopped, and urgent restoration of degraded forests and re-afforestation of coastlines initiated and encouraged.

A real mangrove forest cover per county and the degraded portion



## Achieving sustainable mangrove conservation; community engagement and training is required

In Kenya the coastal communities largely depend on three main mangrove trees types. The seeds of these three preferred types take long to mature (more than 18 months) and worse still, they are prematurely aborted before maturity. The seeds of non-preferred tree types take 4-6 months to mature (Wang'ondou et al., 2013, 2017). This affects the availability of seeds for planting either through natural regeneration or reforestation. In addition, these trees take long (10-15 years) before they can attain maturity stage which is suitable for harvesting. The mangrove forests recovery from destruction usually does not match the cutting rate. It has also been observed that most of the community nurseries also emphasize on one species that is easy to grow in the nursery as opposed to the other non-preferred trees. Thus, seedlings for re-afforestation are always in short supply. Therefore there is an urgent need to create awareness, educate and train the community on sustainable utilization of mangrove trees, conservation of threatened tree types and the need for sustainable seed propagation and re-afforestation efforts. This will help achieve desirable forest coverage, restore degraded coastlines, enhance marine animal life and improve community livelihoods through increased incomes and food security.



Mangrove species cover change between year 1992 to 2009 (Modified from Bosire et al., 2013)

of women groups participating in the conservation exercises, greatly boosting the number of tree nurseries and trees planted, improving forest management and protection of restored areas. This has led to recognition of the role women play in environmental conservation programs.

## Proposed policy interventions

Despite the challenges in achieving sustainable utilization of mangroves, some coastal communities in some counties have actively participated in mangrove conservation through community conservation groups. Though initially women were not allowed to participate in mangrove planting and protection, in the recent past women have spearheaded mangrove conservation efforts. Enhanced women participation has resulted in a big number



Ms. Joyce Marimba who was feted with the Woman of Excellence Award for her efforts in promoting mangrove conservation



In Kwale County the “Mikoko Pamoja” community project has endeavored to conserve mangrove forest from destruction through the carbon market initiative. The community is financially compensated for conserving mangrove forests. Though it is a success story, it needs to be duplicated in other counties and backed by other conservation efforts. In addition, coastal farmers through Community Forest Association (CFA) guided by Kenya Marine Fisheries Research institute (KEMFRI), Kenya Forest Service (KFS), Worldwide Fund for nature (WWF) and other organizations have sought alternative trees namely; Eucalyptus, Cypress, Casuarina, Mukeu and Mvule, to meet wood, fuel and other needs. Though these have helped in mangrove conservation, more needs to be done if mangrove forest cover is to be realized and sustainable utilization embraced by the community. It is therefore evident that community participation has and will continue to play a major role in conservation, sustainable utilization and management of mangrove forests. In line with this, this brief strongly recommends the following policy interventions to reduce degradation

and promote sustainable utilization and re-afforestation of mangrove forests along the Kenyan coast.

1. Ministry of Environment through Kenya Forest Service (KFS) to use CFAs to promote utilization of non-preferred mangrove trees to meet certain social needs.
2. KFS to carry out community awareness on the growth characteristics of mangrove trees so that they are informed on the implications of over utilization of specific tree species.
3. KFS to develop mangrove training sessions and planting programs by developing tree nurseries for all mangrove species in line with the seed development characteristics of different mangrove species.
4. Ministry of Environment and Forestry to develop a holistic mangrove reforestation programme which is all inclusive of all species at the coast.
5. Government of Kenya to fund research initiatives that promote biotechnological improvement of mangrove trees whose genetic resource is reduced so as to increase their forest cover and support local needs.

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## References

1. Bosire, J. O., Kairo, J. G., Olagoke, A. O., Muihaki, L. M., Ogendi, G. M., Jairo, J. G., Berger, U. and Mwacharia, D. (2013) Mangroves in peril: unprecedented degradation rates of peri-urban mangroves in Kenya. *Biogeosciences*, 10, 16371–16404.
2. Dahdouh-Guebas, F., Mathenge, C., Kairo, J. G., Koedam, N. (2000) Utilization of mangrove wood products around Mida creek (Kenya) among subsistence and commercial users. *Economic Botany* 54 (4): 513-527.
3. Government of Kenya (2017), National Mangrove Ecosystem Management Plan. Kenya Forest Service, Nairobi, Kenya.
4. FAO and UNEP (2016) Valuing coastal ecosystem and economic assets; The importance of mangroves for food security and livelihoods among communities in Kilifi County and the Tana Delta, Kenya.
5. Wang’ondou, V. W., Kairo, J. G., Kinyamario, J. I., Mwaura, F. B., Bosire, J. O., Dahdouh-Guebas, F. and Koedam, N. (2013). Vegetative and reproductive phenological traits of *Rhizophora mucronata* Lamk. and *Sonneratia alba* Sm. *Flora*, 208: 522-531.
6. Wang’ondou, V. W., Muthumbi, A., Vanruesel, A. and Koedam, N. (2017) Phenology of mangroves and its implication on forest management; a case study of Mida Creek, Kenya. *WIO Journal of Marine Science* 16 (2): 41-51.

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