

# Management of Alternative Livelihood Options to Local Communities Living Adjacent to the Jozani Chwaka Bay Biosphere Reserve

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**Abstract:** “Alternative livelihood” projects have long been used as a strategy for reducing local community threats toward species, habitats and forest ecosystem in forest protected areas. In Zanzibar, in spite of receiving funds from several development partners targeting livelihood options for communities around the Jozani Chwaka Bay Biosphere Reserve to enhance the life of the communities, they still use the forest for their livelihood. The purpose of the study was to evaluate the management of the alternative livelihood options to the local community living around Jozani Chwaka Bay Biosphere Reserve where the specific objective was to examine the context of Jozani Chwaka Bay Biosphere Reserve and management planning of alternative livelihood design in Jozani Chwaka Bay Biosphere Reserve in Chwaka, Pete, Kitogani, Ukongoroni and Charawe. Yamane (1967) idea was used to choose the sample size of the study by using formula at marginal error ( $E=10\%$ ) to get 94 respondents (local communities households), also six key informants. The data collection of the study was done using interviewer administered questionnaire for 94 respondents (local communities) and six key informants for in-depth interview. The data obtained was analyzed using SPSS v20 and Microsoft excels 2007. Alternative livelihood options are most important project in conservation, The study shows that the local community embrace the economic values and opportunities than the other values like biodiversity, cultural and research and education, however the department of the forest view reserving biodiversity is main source of economic income, so the alternative livelihood options should link this embracement enough to let the local communities living adjacent to Jozani Chwaka Bay Biosphere Reserve not use the forest for livelihood

**Keywords** — Jozani Chwaka Bay Biosphere Reserve (JCBBR) - alternative livelihood options - local community- Department of Forest and Non-renewable Resources of Zanzibar (DFNR) – United Nations Educational Scientific And Cultural Organization (UNESCO)

## 1. INTRODUCTION

In preserving the ecological stability and maintaining the livelihood of local communities living adjacent to the protected areas, the managements of forest ecosystems should consider the well-being of local communities within the protected areas [1] Experiences show that, if well-being of local people is ignored for a long period of time they may adopt harmful actions including degradation of biodiversity [2]

It is very important to understand the basic demands of the forest dependent community as guiding plan for natural resources uses at all levels of governance, especially for poorest natural people [3] Because people living in high conservation landscapes are trapped between their dependence on natural resources to meet their local development objectives and the national and international pressure to conserve these natural resources [4]

For a long time, Alternative livelihood projects have been used as a strategy for reducing local level threats to species, habitats or resources of conservation concern. These projects pursued to alleviate a human threat to biodiversity through

providing, or encouraging the use of an alternative resource, an alternative occupation, or an alternative (lower impact) method of exploitations [5]

Jozani Chwaka Bay Biosphere Reserve (JCBBR) was selected as first UNESCO Biosphere Reserve in Zanzibar (2016) and fourth in Tanzania. This reserve covers 21,274 hectares (ha) constituting its core zone (2,063 ha), buffer zone (4,227 ha) and transition zone (14,984 ha). [6]

There are different projects that aimed to support local communities living around the reserve such that local communities will avoid their selves from depending too much on the forest resources for their basic livelihood. However, several studies show that local communities still depend heavily on the forest resources for their livelihoods including paying weekly fees to saving and Credit Co-operative services [7]

In Zanzibar more than 50000 tourists visited in the Reserve in 2017/2018 economic year, and hence more than 1,000,000,000tsh (435,919.79 us\$) gained as tourism revenue. The revenue is divided by half. 50% goes to the government institutions (32% JCBBR and 18% DFNR) and another 50% return to the community institutions (UWEMAJO 30%, local conservation association 4%,

community mangroves boardwalk fund 8% and community development fund (CDF) 8%. [8]

Despite putting these financial resources to local communities to enhance livelihood the forest degradation is still increasing and the economic situations of local communities around JCBBR are still not convincing [7]. Therefore, it is uncertain as to whether these amounts of money which mostly used as part of alternative livelihood options projects are manage based on the intended goals

The question remains if these provided alternative livelihood options provided to the local communities are working properly and if there are not working where the point of weaknesses are in their management. This research aims to evaluate the management of the Alternative Livelihood Options to the local community living around JCBBR. Within the management is it context of JCBBR (opportunities, core values, threats and influences) or planning (ideas, stakeholder’s involvement, objectives, implementation and set up alternatives livelihood options)?

**A. Objective of the Study**

This is the descriptive research where its general objective is to evaluate the management of the alternative livelihood options to the local community living around Jozani Chwaka Bay Biosphere Reserve. Specifically the study emphasis:-

- To examine the context of Jozani Chwaka Bay Biosphere Reserve and
- To examine the management planning of alternative livelihood design in Jozani Chwaka Bay Biosphere Reserve

**B. Significant of the Study**

The study will provide insights of appropriate model which is effective to support the local communities’ livelihood around the protected areas. Also the study will provide the effective management evaluations which will help to promote transparency and accountability in all process of management of JCBBR to the local community and other stakeholders. It is very critical to unveil gaps surrounding the existing alternative livelihood model since it will help to understanding correct methods that can be used to achieve goals of establishment of effective alternative livelihood thus reducing threats to biodiversity and improve the well-being of the local community around JCBBR. If this study will not be conducted the gap of transparency and accountability of JCBBR will be increasing which will cause the donors and other national and international stakeholder not to be interested on investing in JCBBR. This will lead towards unsustainable management of the forest hence goal of conservation achieved and targeted community benefit from JCBBR will not succeed. Since this is a descriptive research it can be used as secondary data source on the effectiveness of alternative livelihood options management to the local communities living adjacent to protected areas.

**2. MATERIAL AND METHODOLOGY**

**A. Study Area**

This study was conducted in 5 sites (villages) located close to Jozani Chwaka Bay Biosphere Reserve. The five villages are Chwaka, Charawe, Ukongoroni, Pete and Kitogani.



Figure 2.1: Map showing study areas marked with yellow color (Source: DFNR)

**B. Sampling Procedure**

In this study, Pete, Kitogani, Chwaka, Ukongoroni and Charawe villages located in south and central region of Zanzibar Tanzania, were purposively selected as sample sites due to their closeness, commitments and dependability towards this forest protected areas and the cases of deforestations and forest destructions using simple Random sampling design.

**C. Sample Size.**

Sample size was determined using the formula of:

$$n = \frac{N}{1+N(E^2)} \tag{1}$$

At marginal error (E=10%) and confidence level 90%, Where n= sample size; N= sample frame [9]. In this study, N = 1698 households and E = 0.10. By substituting these figures into the above formula gives a sample size (n) of 94 households. Therefore, the sample size for this study was 94 households. Plus six key informant, two from department of forest and non-renewable resources, two from Jozani Environmental Conservation Association and two from Umoja wa Wenye Mashamba Jozani (UWEMAJO) which means Jozani Farmers Union as shown in Table 2.1 below

Table 2.1: Number of sample selected

Villages/Study sites	Number of households	Sample selected in number	Sample selected in %
Kitogani	245	14	5.7
Chwaka	726	40	5.5
Charawe	217	12	5.5
Ukongoroni	187	10	5.3
Pete	323	18	5.6
Department officers and NGOs stake holders	N/A	6	
Total	1698	100	

**D. Data sources**

**Primary data**

Primary data was obtained through questionnaires based interview where by the respondents were households living in Ukongoroni, Chwaka, and Charawe, Pete and Kitogani as well as through key informant interview where the respondents were forest officers from Department of forest and non-renewable resources and from JECA.

**Secondary Data**

Secondary data were obtained from different sources including reports and relevant reference books from Library of the Department of Forest and Non-Renewable Resource of Zanzibar which include published and unpublished papers and reports. Reports and relevant journal papers from internet were also used.

**E. Data Analysis**

Data was analyzed by using Statistical Package for Social Scientists (SPSS) v20 program, and Microsoft excel 2013 was used to plot graphs.

Descriptive data analysis was done so as to explain the main statistical features of the data collected. Data analyses are presented via graphs.

**3. RESULTS AND DISCUSSION**

**A. Context of Jozani Chwaka Bay Biosphere Reserve**

**Core values of Jozani Chwaka Bay Biosphere Reserve**

About 71% of Kitogani, 58% of Charawe, 50% of Chwaka 30% of Ukongoroni and 28% of Pete local communities recognize that the JCBBR core values embrace has all economic, social, cultural, biodiversity, research and education together. But Economic value is embraced more

by local community than other value as shown in Figure 3.1 below

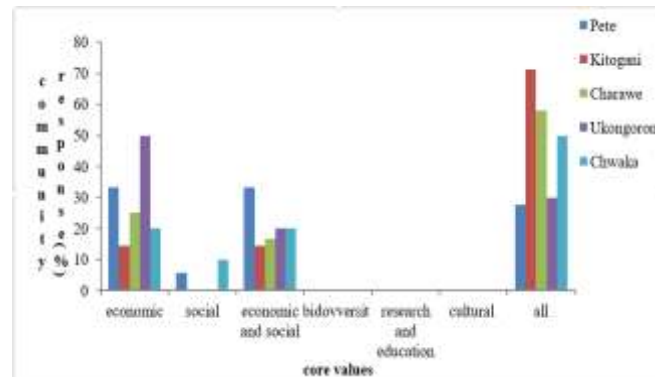


Figure 3.1: Core Values of Jozani Chwaka Bay Biosphere Reserve

Jozani Chwaka Bay Biosphere Reserve is very valuable reserve to the government as well as local community living around it since it is among new six biosphere reserve recognized by UNESCO. According to key informant Department of Forest and Non-renewable Resources this reserve is valuable economically, culturally, socially, research and educations. However the this study shows that local community embrace the economic values then biodiversity, research and education, although the government and conservationists embrace more in biodiversity research and education for example [10] insist local community to view the park as important for pollinations and provisioning of fish and game

**Most important opportunities available in Jozani Chwaka Bay Biosphere Reserve**

The presence of Jozani Chwaka Bay Biosphere Reserve provides different opportunities to the local communities. In which Ukongoroni (50%), Kitogani (43%), Charawe (17%), Chwaka (15%) and Pete (6%) agreed the availability of entrepreneurship opportunity in JCBBR, whereas 75% of Charawe, 30% of Chwaka and Ukongoroni, 28% of Pete and 21% of Kitogani agreed on the availability of employment opportunities as shown in Figure 3.2 below

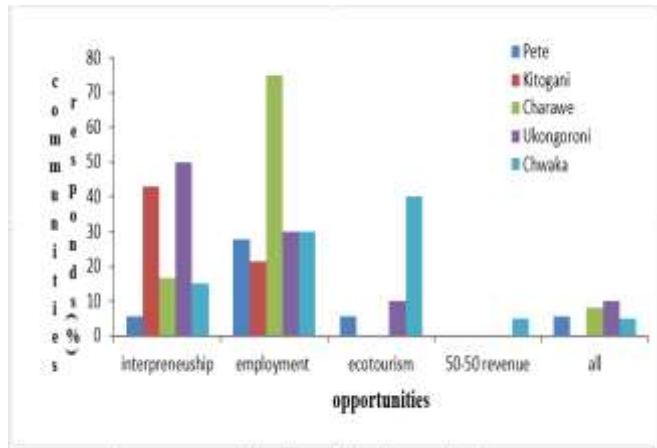


Figure 3.2: Most important opportunities of Jozani Chwaka Bay Biosphere Reserve

The government and local community are getting many opportunities that are obtained from Jozani Chwaka Bay Biosphere Reserve such as trades, employment, ecotourism, agro forest and 50-50 forest revenue divisions between government institutions and community's institutions, according to key informants from Jozani Environmental Conservation Association and Department of Forest and Non-renewable Resources these opportunities depends on the location of particular village. But local community respondents are aware on the employment opportunity and entrepreneurship, for instance Charawe local community who are very close the reserve than other villages are interested in employment opportunities in the reserve (75%). Since [11] argued that areas with higher forest cover tend to have higher forest resource availability, lower agricultural production, and limited access to off-farm employment. Commonly the results demonstrate the embracement of economic opportunities of local community in Jozani Chwaka Bay Biosphere Reserve

**The main threats that Jozani Chwaka Bay Biosphere Reserve faces**

Unfortunately the Jozani Chwaka Bay Biosphere Reserve are facing two major threats which are both extractions of natural resources and fires. About 83%, 70%, 67%, 60% and 43% of respondents from Charawe, Pete, Chwaka, Ukongoroni, and Kitogani respectively agreed that JCBBR are threatened by both extraction and fires (Figure 3.3).

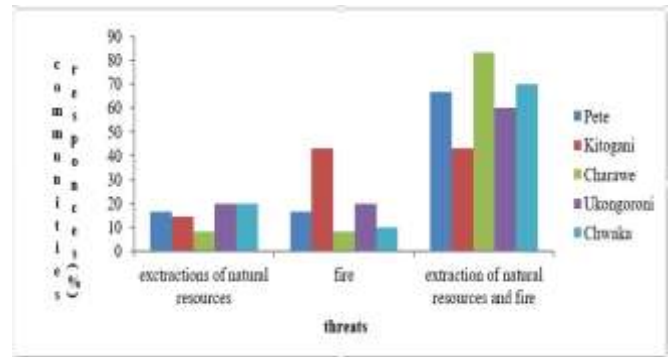


Figure 3.3: Major threats facing Jozani Chwaka Bay biosphere reserve

The results shows that JCBBR is facing many threats which are extractions of natural resources, fire, agriculture and grazing, however average of 64% of local communities of Charawe, Kitogani Ukongoroni, Chwaka and Pete agreed that the extractions of natural resources from the forest through hunting and deforestation and fire are caused by wild honey collection noted as the major threats that faces the JCBBR. This study found two major sources that lead deforestation which are cutting trees in spite of implementations of alternative livelihood options, and wild honey collection by using fire which accidentally lead the burning of the forest. However, some of local communities believe that the forest is burned intentionally due to the political affiliation. This point out that if management JCBBR able to diminish these two threats the JCBBR will be well conserved, and therefore the alternative livelihood options should base the reduction or totally diminish the two threats. [12] Divided the biological resources uses (75%) and fire (49%) as the level one and level two threats are frequently reported. Also [13] agreed that fire is among extractions of resources and fires are the frequently mentioned threat in Colombian protected areas (Parks)

**Factors that influence the management of conservation of JCBBR**

The local community respondents said that major factor that influence the management of JCBBR is the diminishing of the local community's land allocated for sustainable uses Ukongoroni (70%), Chwaka (60%), Kitogani (43), and Charawe (14%) have been completely exhausted.

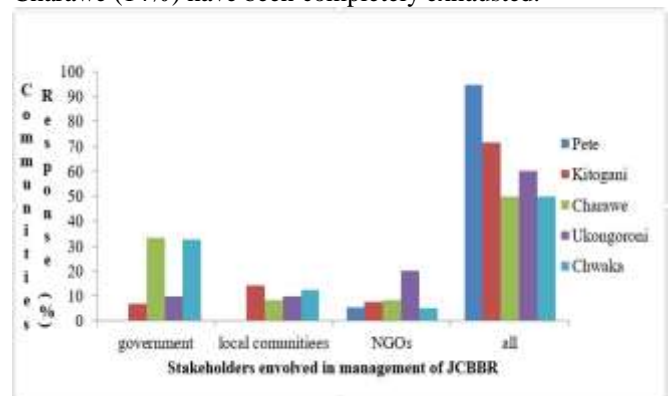




Figure 3.5: Jozani Chwaka Bay Biosphere Reserve management involved stakeholders

This results indicate that the JCBBR management involves the government through department of forest and non-renewable resources of Zanzibar, NGOs like Jozani environmental Conservation Association (JECA), Jozani farmers union (UWEMAJO), and Zanzibar Butterfly Conservation (ZBC) together with local community in preparation, planning and implementation of alternative livelihood options project as average 55% of local communities of Pete, Kitogani, Charawe, Ukongoroni and Chwaka agreed. And this participatory method of involvement of local communities in management of protected areas has approved by [1] when he said that good management is that management which involves local communities that live near the protected areas.

**B. Planning of alternative livelihood options management**  
**Idea (proposal) of alternative livelihood options to the local communities**

Local community respondents revealed that foundation of ideas to start alternative livelihood options projects are mainly coming from local communities (67% of Charawe, 60% of Ukongoroni, 58% of Chwaka, 44% of Pete, and 21% of Kitogani). The local communities' ideas for the alternative livelihood options include agriculture, small trades, fishing and dress making.

On the other hands, about 79% 56% 43%, 40%, and 33% of respondents from Kitogani, Pete, Chwaka, Ukongoroni and Charawe said that project ideas came from forest department and they just adopted the projects of alternative livelihood options (Figure 3.6). The types of projects adopted by local communities from Forest department includes bee keeping, wood lock, butterfly keeping, hand craft activities, efficient cooking stoves, plant nurseries, credit and saving groups, fish keeping and vegetable agriculture.

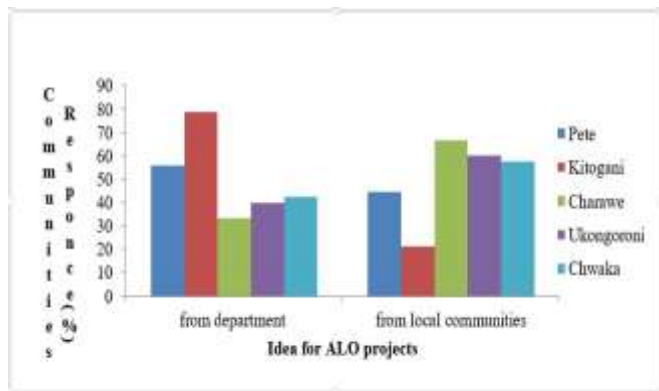


Figure 3.6: Source of Idea for alternative livelihood options projects

Table 3.1: Ideas for alternative livelihood options

Local communities	Department of forest and non renewable resource of Zanzibar
Agriculture Pete (39%), Kitogani (36%), Charawe (67%), Ukongoroni (30%) and Chwaka (43%)	Bee keeping Charawe (8%), Ukongoroni (20%) and Chwaka (2%)
Small trade Pete (6%), Kitogani (21%), Charawe (8%), Ukongoroni (20%), Chwaka (18%)	Wood lock Pete (6%), Kitogani (14%), Charawe (8%), Ukongoroni (10%) and Chwaka (8%)
Fishing Chwaka (25%)	Butterfly keeping Pete (22%) and Chwaka (18%)
Dress making Kitogani (7%)	Livestock keeping Kitogani (7%)

The local communities and department of forest and non-renewable resources are working together in the suggestion of alternative livelihood options projects so the local are free to choose the idea of alternative livelihood options projects from either department or local communities themselves as [15] suggested that in planning of management of any conservation projects both exclusive and inclusive management model should be used.

**Objectives of alternative livelihood options.**

Results reveal that major established objectives for the alternative livelihood options projects include conserving the forest and enlarge the local community income simultaneously (Ukongoroni (100%), Pete (89%), Kitogani (71%), Chwaka (65%). and Charawe (58%). As shown in Figure 3.7

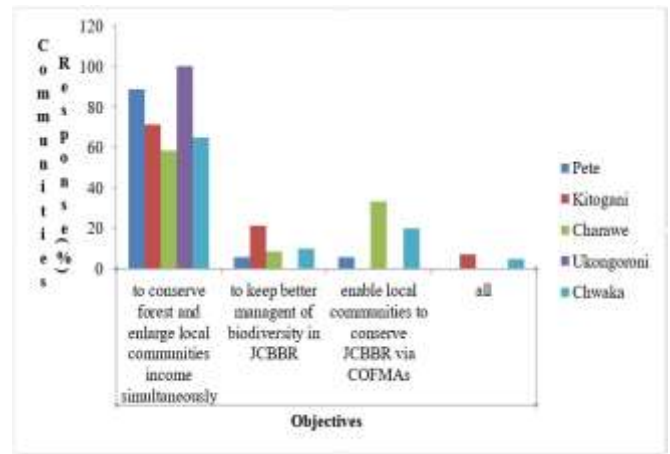


Figure 3.7: Objectives of livelihood options to the local communities

There are many objectives of alternative livelihood options as they provided by the Department of Forest and Non-renewable resources of Zanzibar. although the first objective which to conserve forest biodiversity and enlarge local communities income simultaneously is the only one which agreed by majority of local communities of Ukongoroni, Charawe, Pete, Chwaka and Kitogani in average of 77%, this is for the reason that the objective touches the economic income of the local communities which is indispensable factor of management of alternative livelihood options as

[16] argue that to understand rural livelihood strategies and environmental resource dependence can help to reduce and prevent livelihood stresses caused by the degradation of environmental resources during the development process, especially for low income households and therefore it is very important to view local community income as very crucial matter in the process of setting objectives of alternative livelihood options.

**Alternative livelihood options implemented to the local community living around the reserve**

Agriculture (average of 43%) is the alternative activity that is implemented by the most of local community provided in different villages that surround the JCBBR apart from other alternative activities.

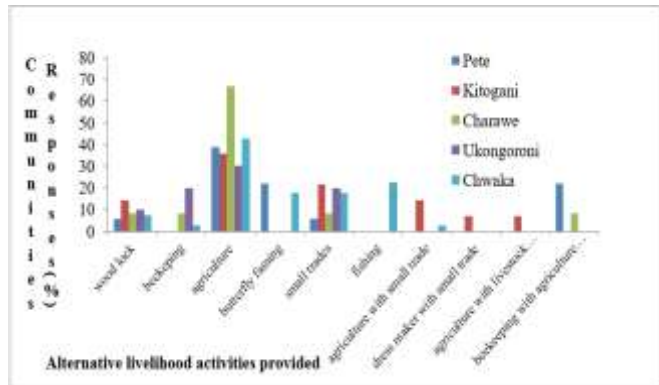


Figure 3.7: Alternative livelihood activities provided/done by local communities

The majority of local communities are engaged in agriculture average percentage 43% even though they implement the small scale agriculture which depends on the rain fall. The results shows that Charawe implement agriculture more than other village and Chwaka engage more in fishing due to the presence of Indian Ocean near the village. These alternative livelihood options the most important compared to other activities in management of JCBBR to the local communities to defend the exploitation of natural resources from the JCBBR. But the alternative livelihood options to local community should be managed to be substitution activities which will lead local community to leave the forest and dealing other activities since for the alternative livelihood options to work properly they should replace the time for local community to think about using the forest as [17] suggests.

**Alternative livelihood option set up by local communities**

In Pete 94% of local communities set their projects individually while 6% in groups, In Kitogani 57% of local communities set their alternative livelihood options projects setup in both groups and individually, 36% in groups, and 7% individually. In Charawe 42% of local communities set their alternative livelihood options projects setup in both groups and individually, 33% individually and 25% in groups, In Ukongoroni 40% of local communities set their

alternative livelihood options individually, 30% in groups, while 30% in both, In Chwaka 43% of local communities set their alternative livelihood options projects individually, 30% in groups, and 28% in both groups and individually

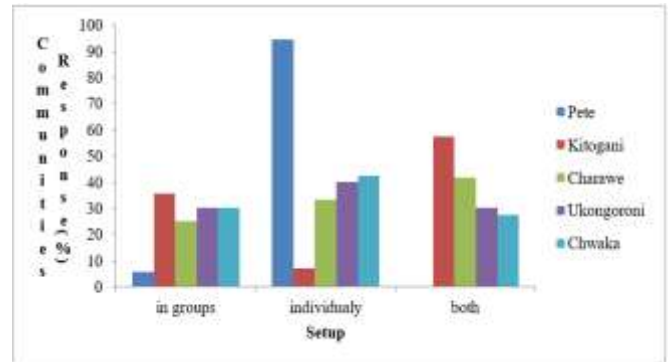


Figure 1: Setup of alternative livelihood options

The project involves the local communities in groups, individually or both. But many local communities Kitogani, Pete, Chwaka, Charawe and Ukongoroni average percentage of 43% are not joined in the saving and credit groups under umbrella of Jozani Environmental Conservation Association. Hence they set their own alternative livelihood options projects individually; this is because they claimed that the money is needed to drive those groups for joining and saving after every week. However members of these saving and credit are very satisfied and they suggest others to join because they get to help each other in groups and this fact is agreed by [18] when he said that VSLA is beneficial. Also [19] found that these VSLA members view the groups as supportive system since they support each other in the time of needs. According to the local communities who are members of the saving and credit groups, said that the groups helped them to reduce the dependency of the forest totally. On the other hand results found that some of them claimed that they must go to forest to cut trees for money that used to pay weekly SACCOs fees. Also different NGOs like Jozani Environmental Conservation Association, is helping local communities through their saving and credit groups. The local communities to be participated in alternative livelihood options identified and contacted through Jozani Community development and conservation committees, and JECA. Another way of identifying and contacting the local communities is through their credits and saving groups.

**4. CONCLUSION.**

In order to local communities to participate in conservation of Jozani Chwaka Bay Biosphere Reserve they must be aware on the total contexts of Jozani Chwaka Bay Biosphere Reserve (i.e. the values and opportunities available in the reserve as well as the threats that Jozani Chwaka Bay Biosphere Reserve faces). The management should make sure that they provide enough education on the other values

and opportunities found in the reserve like cultural values, research and education and others, since by only knowing economic values as only value of the reserve make them think that the forest is only reserved for the government advantages and hence the destructions of the forest will be very high. The local communities are very significant part of conservation strategies and they should be included in conservation plans, conservation areas and conservation governance so as to archive the goals of Jozani Chwaka Bay Biosphere Reserve and forest conservation. The local communities are the principal implementers of alternative livelihood options under Jozani Environmental Conservation Association. More education should be provided on the base of building the link between the local communities and department of forest interests and objectives.

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