Arabuko-Sokoke Forest Management and Conservation Project

STRATEGIC FOREST MANAGEMENT PLAN

SUBSISTENCE USE OF Arabuko-Sokoke Forest

Proceedings of Subsistence use planning Workshop held at Gede Ruins on 28th March 2001

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Proceedings for Subsistence use Workshop

Date: 28th March 2001.

Facilitator: Mr. Anthony Githitho and Mr. Joram Kagombe

Position paper presenter: Mr. M.T.E. Mbuvi

1.0 Introduction

The workshop started with prayer followed by self-introduction of the participants. The participants were drawn from the local community, provincial administration, local leaders, ASFMT members, project extension officers, officers from MOU secretariat, officers from headquarters of KEFRI, FD, NMK and KWS and officials from FADA.

Mr. Peter Branney (the strategic forest management consultant) was invited to made the opening remarks. He emphasized the importance of the workshop as a forum of getting views from stakeholders on the future management of the forest. Among other things he said that the discussions of the Workshop would be fed into the strategic Management plan for the forest.

2.0 STRATEGIC FOREST MANAGEMENT PLANNING PROCESS Presented by Mr. Kagombe

The planning framework for Arabuko-Sokoke will develop to meet the needs of forest managers who have to take into consideration multiple stakeholders and multiple objectives.

The planning framework to consists of both top-down (strategic) and bottom-up (operational) plans. This allows the strategic forest management plan to be prepared for a longer period (25 years) with various types of operational plans to be prepared for different types of activity over much shorter periods (normally less than 5 years). The strategic forest management plan provides the broad framework against which operational plans are approved. If an operational plan does not comply with the priorities, principles and strategies outlined in the strategic plan, it will not be approved for implementation

Information and data required

- low-resolution data is required for strategic planning
- high-resolution data is required for bottom-up planning

Strategic plans are less data intense, but more data diverse

2.2 Comparison between a Strategic and Operation plan

FEATURES OF THE STRATEGIC FOREST MANAGEMENT PLAN

- Strategic rather than prescriptive, allowing for bottom-up planning and accommodation of a wide range of stakeholder interests
- More comprehensive. Covers a wider range of forestry interests including the public, community, and government sectors
- More open to public scrutiny due to public interest and the need for transparency
- Long-term (25 years)
- Not expected to alter significantly over the plan period, although should be periodically reviewed - especially in the light of policy changes
- Prepared through a participatory process (consultative) which is inclusive of all stakeholders or their representatives
- Identifies strategies which are informed by real experience and good information
- Sets out principles and guidelines for operational planning and provides a basis for approving and funding such actions
- Interprets national policies in the local context of Arabuko-Sokoke Forest
- Emphasis on map-based information presentation
- Has no budget – only prioritised strategies
- Approved centrally (CCF level)

FEATURES OF OPERATIONAL FOREST MANAGEMENT PLANS

- Time bound – between 1-5 years
- Prepared following the principles and guidelines in the SFMP
- Focus on achieving objectives through implementing actions for a specific, identified site
- Approved locally (DFO level) according to compliance with the SFMP
- Prepared by front line staff (with specialisec assistance if needed)
- Contain a budget which is approved and committed when the plan is approved
- Site specific and participatory - prepared through the involvement of all local stakeholders
- Time bound – between 1-5 years
- Prepared following the principles and guidelines in the SFMP

2.3 STEPS IN PREPARATION OF SFMP

1.0 Visioning workshop held in September
2.0 Draft strategic management objectives –goals
3.0 Indicative zonation
4.0 Identification of working principles
5.0 Issues identification
6.0 Stakeholder identification
7.0 Assessment of information requirement for each zone
8.0 Further information gathering
9.0 Zoning workshop held in November
10.0 Thematic Workshops
    10.1 Problem Animal Control held in March
    10.2 Ecotourism and education held in March
    10.3 Infrastructure
    10.4 Human resource Development
    10.5 Illegal Activities
    10.6 Biodiversity Conservation
    10.7 Sustainability
    10.8 Subsistence use
    10.9 Policy, Legal
    10.10 Environmental profile
    10.11 Reseach, Monitoring and Approval
    10.12 Crosscutting themes
11 Prepare management guidelines for each theme
12 Summarise workshop proceedings
13 Consult key stakeholders
14 Draft management plan
15 Workshop to present the plan
16 Revision of the plan
17 Approval of the plan

2.4 Vision Statement for Arabuko-Sokoke Forest

Our vision for 2025 is for an intact and fully functioning forest ecosystem with no reduction in the existing forest area. We envisage that:

- Local forest adjacent communities will have the opportunity to participate in meaningful ways in the management of Arabuko-Sokoke Forest, and to be the primary beneficiaries of its products and services.
- The unique Biodiversity of the forest will be expressly conserved and enhanced though any forest management interventions and actions.
- Forest resource condition will be developed and improved through management actions, which emphasize the use of best practice and the best available information.

- Environmental education and eco-tourism will be enhanced as opportunities for linking wider society with for management of the forest.
- Sufficient resources will be made available to support an effective and motivated forest management team enabling them to meet the challenge of this ambitious vision.

2.5 Overall Purpose

- *Sustainable forest management and conservation practices established and in operation*

2.6 Strategic Management Objectives

In order of priority these are:

- *To conserve and enhance the unique Biodiversity of the forest*
- *To contribute towards meeting subsistence needs and improving livelihoods of forest adjacent communities*
- *To improve and develop forest condition and utilisation potential for a range of forest products and service*

Principles of long term Approach are given in the main paper of strategic planning provided as an annex.

Focus of the workshop

Mr. Kagombe requested the participant to focus their contribution to the thematic workshop in order to get maximum output from the day's workshop. The workshop is to focus on subsistence products and services the community derive from the forest. The position paper will give the current status of utilization and then the workshop participants will discuss the prospects for future use taking into consideration the aspects of sustainability.

3.0 Presentation of discussion/position paper by Mr. T Mbuvi, on subsistence use.

Summary of the paper
Communities have been getting subsistence products from the forest illegally since mechanisms are not in place for legal subsistence use of forest

Increase in population has led to more pressure of the forest products and services

Community neighboring the forest have different requirements for the forest and so its difficult to have a uniform criteria for use

Subsistence use can further be differentiated to domestic and commercial use. The trend in the forest is that some of the domestic uses are converting to commercial use.

Some fruits from forest have high commercial value and yet farmers have not considered them for domestication eg Ladapha kirkii

The zone where wood curving is practiced has expanded as compared to the scenario in 1991 to cover a large area meaning more destruction of the forest

Community use forest as source of fresh clean water

Issues for consideration

1. Will subsistence be allowed in all community areas?
2. Does the forest have adequate subsistence resource to meet the demand of the community?
3. How far should subsistence zone extend and how will it be managed.
4. Does a framework exist to allow dynamism in forest management that will take care of the growing population, change of attitudes and different income levels?
5. How do you change attitude to facilitate stakeholder participation?
6. Are there policy and legal mechanism to support subsistence use.
7. How do we ensure sustainability of products removed from the forest.
8. Do we mechanism to increase farm activities to reduce pressure from the forest.
9. How do we deal with illegal wood curving and game hunting?
10. How do we reconcile conflict between subsistence use and conservation needs.
11. How to ensure equitable resource allocation.
12. How to deal with competing land uses leading to demand for excision.
13. Development of zonation guidelines.

3.1 Wood curving status by Simon Choge[1]

The studies were conducted in Malindi, Mombasa and Lunga Lunga in 1988-2000, on behalf of UNESCO.

Highlights in his presentation were as follows:

- The economic value woodcarving is $ 20 million. There are 10 species in the market.
- Bracheyleana has the highest volume, but neem is steadily taking over mainly due to the Karura crises. Wood carvers concentrated in Malindi and Lunga Lunga along the coast. There has been a decline in volumes in 1998 -2000. A stable supply of Neem would take care of the supply to the industry for a long time. A.S.F. is a big supplier of wood to Mombasa and Malindi. There is need to plant alternative fast woodcarving species for the market.
- The handicraft industry is an important source of livelihood to millions of people in developing countries. The largest value and volume of African curving in international trade come from Kenya (Cunningham et al, 1999). Today, 60,000 carvers produce commercial carvings for export, providing household income to an estimated 350,000 dependants and an export value estimated at US $ 20 million annually (Obunga, 19995). The international trade is having serious impact on resources and habitats with local and in some cases, global significance. As the trend of the trade continue rising the preferred species faces serious threats with serious implication on the environment, viability of the industry, and hence the livelihood of hundreds of thousands who depend on the industry for economic prosperity and survival.
- A total of nine major species were identified and found to dominate wood curving in the period 1998 to 2000 (Choge, 2001). They include *Brachylaena huillensis, Olea europaea, Dalbergia melanoxylon, Combretum schumanii, Azadirachta indica, Jacaranda mimimsifolia, Terminalia brownii, Mangifera indica, Sprirostachys africana, Diosyros cornii, and Afzelia quanzensis. Bracylaena huillensis* and *Azadirachta indica* contribute to 74.1% of the volume used during the period.
- The highest concentrations of Kenya carvers are found in the Kenyan coast. This is reflected in the distribution of volumes utilized for carving where 72.2% was consumed at carving centers along the Kenyan coast (Malindi, Mombasa and Lungalunga). Considerable amount of Brachyleana utilized in the coast is imported from Tanzania.
- Study done on diameters of wood entering the market as an indicator of level of exploitation showed that for Brachylaena, the logs entering the market were dominated by logs of 10 15 cm diameters. The targeting of juveniles is an indication of scarcity and serious ecological and conservation status at the source areas.
- *Azadirachta indica* (neem) had proved a good alternative to Brachyleana especially in coast. The diameter profiles indicate a relatively stable resource

[1] Research officer KEFRI

population with optimum diameter of logs utilized for curving estimated at 27-28 cm.

- All wood carving materials entering the market and got from state forests is illegal wood because ban of their utilisation is in force. Illegal sourcing has made the prices to be distorted, far below the market prices. The wood dealers make a huge profit and this has attracted a big number of middlemen who now dominate the round wood supply in Kenya. The price at the source is about a quarter of the price at the wood curving area. This makes the illegal cutters cut more wood to meet their livelihood.
- *Azadirachta indica* has a very high potential as alternative wood carving species for on farm production. It can attain a carving age in 17 years with a diameter of 16 cm. Clear felling of a neem plantation can be carried out at the age of 36 years when the diameter is about 48 cm.
- The slow growth of *Brachyleana huillensis* is the main limitation to its commercial growing on short and medium terms. This slow growth is the reason to use the existing Brachyleana resources more carefully and economically if future supply is to be assured (Choge, 2001)

3.2 Ader's Duicker status brief presentation by Erustus Kanga[2].

- The only Mammal found in Cynometra woodland. Three duickers spotted during study in forest. A generous estimation of an existence of 400 duickers in forest was worked out. The presence of people causes displacement of the mammal from the territory. There is destruction of food and plants, habitat reduction and population suppression.
- Hunting of animals is not allowed under the act unless with special permission of the director KWS. Such permission is given to private ranches or can be given to public land so long as the person requesting for the permission can satisfy the department involved that they are in a position to hunt in a sustainable way.
- The communities in Arabuko-Sokoke Forest do illegal hunting of mammals. The main method of hunting is use of traps. In a study conducted by Kanga, 47.7% of traps were active while 52.3% were inactive. An inactive trap would mean that it was successful in getting its prey. The density of traps in the three vegetation types was as follows

Vegetation type	Frequency	Density per km2
Cynometra	.25	26.8
Mixed forest	.26	21.8
Brastegia	.11	7.1

[2] Research scientist, KWS

The high incidences of traps in the forest points towards commercial markets of game meat as opposed to domestic use

3.3 Bee keeping status, presented by David Lagat[3]

800 people are involved in bee keeping around the forest. The productivity is low, 4.7 kg/hive/year. Some traditional beekeepers are getting higher production than project farmers. There are 54 species of honey flora in the forest. A tentative floral calendar was developed

The problems facing beekeepers include;

- low output,
- high rate of bee absconding,
- inadequate equipment's
- presence of pests and predators
- Poor harvesting and processing methods
- Low level of skills
- Lack of extension skills

4.0 Reactions of participants in connection with the presentations

- It is important for *Brachyleana* to be planted on individual farms and in government forests, though it is not feasible for short-term investments. It could be combined with fast growing species. The main promising alternative is Neem tree. The earlier reports of parasitic pest infections on neem was not of economic value. There are currently a total of 36 farmers who have planted *Melea arborea* as an alternative species to wood curving.
- Need to discuss pole wood and the priorities, which the community has in terms of subsistence use.
- A lot of wood curving material originates from the Tanzania. There is need for policy instrument to control wood coming from Tanzania and its effect on local wood value.
- One addition criteria for subsistence use in the ability of the community group to manage a given area of forest
- More productivity can be obtained from the forest if managed systematically and well protected.
- Concerns were raised for the continued increase of hunting levels with reports indicating that the trend is going towards commercial level. It is important to device control measures to curb hunting or introduce controlled hunting. The condition is that the community together
- The status of Aders Duicker and Brachyleana needs to be established.

[3] Research officer, KEFRI, Study conducted in Arabuko-Sokoke Forest

- The definition of what is subsistence use need to be clarified and implication of changing an activity from subsistence to commercial investigated. It was noted that change from subsistence to commercial is part of product development
- Free extraction of medicinal plants should continue to help the poor who would not be able to afford charges imposed on them to do so.
- There is need to know who are actually using the resource i.e. from within or outside?
- Need to know how to separate subsistence from commercial use, though when subsistence becomes surplus, it can be used for commercial use. What is the implication of changing from subsistence to commercial use?
- The value of A.S.F to the community is much higher than its value to the government.
- What should be done to ensure equity in the use of the resource?
- Ban by the government not very effective.
- It was noted that the value of the forest to the community is much higher than the value in terms of revenue that the government gets from the forest. The community need to have equitable contribution to conservation of the forest since its of importance to them.

4.1 Vision for subsistence use

The vision for Subsistence use is to Devise ways of improving FAC livelihood security and diversifies them through forest resources through substitution without compromising forest Biodiversity.

4.2 Constraints/problems hindering us from reaching the vision

- Unclear terms.
- Unsustainable resource management/use.
- Need to alleviate poverty.
- Inadequate information for subsistence man use.
- Subsistence/commercial terminology unclear.
- Zonation parameters/limits not clear, resolved.
- Unclear policies.
- Roles of local Institutions unresolved.
- Women/youth not involved.

4.3 GROUPS formation

Group 1 - Information gaps
Group 2 - Benefit sharing/unclear policy and institutional roles.
Group 3 - Unsustainable resource management/communication.
Group 4 - Zonation, commercial/subsistence use
Group 5 - IGAs/Gender/Poverty.

Tasks

Issues
Strategies (What should be done to reach the vision.)

4.3.1 Group 1: Information gaps/Lack of adequate knowledge

Information gaps

(1) Need to clearly establish resources the adjacent communities are getting from the forest (compile list).
(2) Gather more data/information on the forest ecosystem through inventories and Biodiversity surveys, with a view of establishing the ecological status of species taken from the forest(plants/herbs/animals etc)
(3) Quantify the amount of resources the community gets from the forest.
(4) Sustainable off-take level information,(yields vs extraction)

Lack of adequate knowledge

(1) Lack of exposure to outside world as regards participatory forest management.
   - ❖ Organize cross-site visits/exchange programs for all Stakeholders.
   - ❖ Avail video and publication easily.

(2) Gross value of entire forest is not adequately defined.
   - ❖ Undertake detailed resource valuation and create awareness to all Stakeholders.

(3) Inaccessibility of existing relevant information.
   - ❖ Make information accessible
   - ❖ Networking of Stakeholders/Awareness.

4.3.2 GROUP 2: Benefit sharing/unclear policy and institutional roles.

Benefit sharing

(1) Inability to pay for forest products.

- ❖ Support/Introduce IGAs for livelihood improvements.
- ❖ Provide leeway free services/resources for deserving cases.

Policy

1(a) Unclear policy and legal framework - Forests and Wildlife Act. Existing opportunities not being fully utilized.

- ❖ Create awareness to the Stakeholders.
- ❖ Seek clarification from relevant Institutions

(b) Inadequate legal framework to address subsistence utilization

- ❖ Lobbying for amendments within the existing Acts and Bills.

2.Role of forest adjacent community in sustainable forest management is not established/formalized.

- ❖ Roles defined and implementation agreements formalized.

3. Poor co-ordination between Institutions.
   - ❖ Strengthen the implementation of M.O.U at field and national levels.
   - ❖ Enhance information sharing.

4.3.3 GROUP 3:Unsustainable-resource management/communication

Issues: Unsustainable resource management

1. Forest degradation as a result of high level of subsistence use - poaching poles, mammals etc
2. Inadequate valuation of forest resource.

Strategy

1. Inventory of the forest resource - poles, wood, animals, mushroom etc.
2. Establish community demand of the forest resource.
3. Rehabilitation of the forest.
4. Training the community on the proper use of the forest.
5. Create awareness of the importance of the forest.
6. Providing alternatives like- domestication of small animals
   - On farm tree planting
   - Brick making for building.
7. Improve policing of the forest through establishment of community policing.
8. Increase/change in roles of staffing and other resources at management level.

Issues: **Communication**

1. Inadequate means of communication e.g. vehicles, telephones
2. Inadequate communication between forest management and community.
3. Poor transport facilities.

Solutions

1. Provision of adequate means of communication - vehicles, mobiles, radios etc.
2. Introduce participatory learning between forest management and community - KWS, Forest etc.
3. Improve infrastructure - roads, offices, telephones etc.
4. Promote/implement participatory forestry.

4.3.4 GROUP 4: Zonation, commercial/subsistence use

Issues

- Different products are in different parts of the forest (all products to be zoned individually - not blanket for subsistence use)

- Fuelwood: - Licencing to be area specific.
  - Priority area to be zoned - Eastern side of A.S.F
  - A.S.F Eastern side is the only area with mixed forest and Brachsytegia woodland.
- Control mechanism has to be put in place using the intervention zone e.g. using on farm forests, alternative sources of energy-solar, fire-less cookers (also applicable on Western side)

Land poles (building material)

Strategies

- Characterize the forest into poles and timber zones.
- Determine the available quantities of poles and timber
- Explore the possibilities of using mangrove which grow faster and has sustainable regeneration (Eastern side A.S.F Mida Creek)
- Hasten planting of on farm trees (Eucalyptus-control methods of termites, other species senna SPP).

Subsistence zone

- Western side A.S.F - can move up to 1 Km.

- Eastern side A.S.F - We have to consider intervention where we have Brachystegia woodland.
    - Where we have mixed forest they can move upto 1Km
    - All over up to 1Km within the boundary can be used.

Wood carving:
Issues
- Determine quantities available for wood carving and develop fast growing substitute species.
- Wood carving transcends between subsitence and commercial. Should wood curving be considered as commercial or subsistence

Strategies
- Hasten planting species(alternative species) e.g. neem, mango, gmelina arborea, cashewnut trees.
- KEFRI to do more research on breeding for fast growing indigenous species e.g. Brachyleana.

Fruits/Herbs: mushroom, vegetables:
Issues
- Determine available quantities of herbal species
- Establish species and quantities which are used and the type of use.
- Domestication of fruits and herbs into farms.
- Lack of information on marketing

Strategies
- Conduct inventory of fruits and herbs, and conduct resource use patterns
- Plant promising trees/herbs on the farms
- Look into market value of both fruits and herbs.

Bushmeat?

Issue
Continued illegal hunting of animals in the forest. The issue touch on policy of KWS on hunting

Interventions - Domestication of some animals
- Research to know quantities available and harvesting levels
- Review of policy on hunting to reflect reality on the ground
- How to separate subsistence from commercial use.

In most cases, what starts as subsistence ends as commercial

4.3.5 GROUP 5:IGAs/GENDER/POVERTY

Poverty

Causes

(i) Low income e.g. low purchasing power
(ii) Increasing population around FAC
(iii) Unemployment
(iv) Low soil productivity
(v) Animal damage (crops) e.g. elephants, baboons etc.

Strategies

(i) Promote Non-consumptive use of forest e.g. increase beekeeping, butterfly farming (within A.S.F).
(ii) Diversification of income generation activities e.g. farming (outside A.S.F) e.g. agroforestry.
(iii) Empower the community to control problem animals e.g. by distributing thunder flashes and training the community on its use to scare off elephants, also involving the community in patrols.
(iv) Reducing dependency on forests
(v) KWS to intensify patrols for problem animals.

Income generating activities (IGAs)

Issues

(i) Marketing - Lack of places to sell products e.g. mangoes
- Poor pricing of products e.g honey
- Meeting Quality of product e.g butterfly species

(ii) Few income generating activities
(iii) Innovation (poor) - lack of value adding.

Strategies

(i) Marketing information and strategy needed e.g. pricing, quality requirements.
(ii) Increase and diversify income-generating activities.
(iii) Training and sensitization on micro-enterprising.

Gender

Issue

(i) Gender disparity - women overburdened in household activities among others.

- Girl child education poor
- Early marriage of girls
- Male dominance in most activities

Strategy

- Attitude change on all aspects of their livelihoods.
- Education, seminars and training.
- Women representation in Associations at an equal ratio with men especially those that aim at community development.
- Poverty can be dealt with by reducing forest dependency by the community.

5.0 Underlying principals for subsistence use

1. Use modern techniques like GIS in management
2. Ensure that intellectual property rights are respected
3. Efforts should be made to reduce the community dependence on the forest

6.0 Action points

1. Workshop report to be out within one month from the date of the Workshop.
2. Circulate report for comments, within two weeks.
3. Conduct resource assessment in the forest.
4. Explore possibilities of alternative sources of protein to the communities.

Summary of Issues and strategies

Main Issue	issues	Strategies
Information gaps	1. Establish resources the adjacent communities are getting from the forest. 2. Inadequate data/information on resources. 3. Establish the Sustainable off-take level.	▪ compile list of resources ▪ Quantify the amount of reso community gets from the for ▪ Carry out inventories and Bi surveys, with a view of estal ecological status of species forest(plants/herbs/animals ▪ Get information on yields ar levels
Lack of adequate knowledge	1. Lack of exposure to outside world as regards participatory forest management. 2. Gross value of entire forest is not adequately defined 3. Inaccessibility of existing relevant information	▪ Organize cross-site visits/ex programs for all Stakeholde ▪ Avail video and publication ▪ Undertake detailed resource create awareness to all Stak ▪ Make information accessible ▪ Networking of Stakeholders.
Poor/unexisting Benefit sharing mechanisms	1. Inability of some community members to pay for forest products. 2. Undefined benefit sharing mechanism	▪ Provide leeway for free serv for deserving cases. ▪ Work out modalities for fore sharing between FD and co
Policy	1. Unclear policy and legal framework - Forests and Wildlife Act. Existing opportunities not being fully utilized. 2. Inadequate legal framework to address subsistence utilization 3. Role of forest adjacent community in sustainable forest management is not established/formalized. 4. Poor co-ordination between Institutions	▪ Create awareness to the St ▪ Seek clarification from relev ▪ Lobbying for amendments v existing Acts and Bills ▪ Roles defined and implemer agreements formalized ▪ Strengthen the implementat at field and national levels. ▪ Enhance information sharin
Unsustainable resource	1. Forest degradation as a result of high level of subsistence use - poaching	▪ Inventory of the forest resou wood, animals, mushroom e

management	poles, mammals etc **2.** Inadequate valuation of forest resource.	▪ Establish community demar resource. ▪ Rehabilitation of the forest. ▪ Training the community on t of the forest. ▪ Create awareness of the im forest. ▪ Providing alternatives like- c of small animals ▪ On farm tree planting ▪ Brick making for building. ▪ Improve policing of the fore establishment of community ▪ Increase/change in roles of other resources at manager
Communication	4. Inadequate means of communication e.g. vehicles, telephones 5. Inadequate communication between forest management and community. 6. Poor transport facilities.	▪ Provision of adequate mear communication - vehicles, n etc. ▪ Introduce participatory learn forest management and con KWS, Forest etc. ▪ Improve infrastructure - roa telephones etc. ▪ Promote/implement particip
Zonation	1. Different products are in different parts of the forest 2. Forest has other users with different use requirements	▪ All products to be zoned ind Fuelwood: - Licencing to be ▪ Priority area to be zoned - E A.S.F. A.S.F Eastern side is with mixed forest and Brach ▪ Control mechanism has to b using the intervention zone farm forests, alternative sou energy-solar, fire-less cooke applicable on Western side)
Land poles (building material)	Sustainable management of forest to produce land poles	▪ Characterize the forest into timber zones. ▪ Determine the available qua and timber ▪ Explore the possibilities of u which grow faster and has s regeneration (Eastern side /

		Creek) ▪ Hasten planting of on farm t
Subsistence zone	Defining the extent of subsistence zone	▪ Western side A.S.F - can m Km. ▪ Eastern side A.S.F - We ha intervention where we have woodland. ▪ Where we have mixe can move upto 1Km ▪ All over up to 1Km wi boundary can be use
Wood carving	1. Determine quantities available for woodcarving and develop fast growing substitute species. 2. Woodcarving transcends between subsistence and commercial. Should wood curving be considered as commercial or subsistence	▪ Hasten planting of alternativ neem, mango, gmelina arl cashewnut trees. ▪ KEFRI to do more research for fast growing indigenous Brachyleana.
Fruits/Herbs: mushroom, vegetables:	1. Determine available quantities of herbal species 2. Establish species and quantities which are used and the type of use. **3.** Domestication of fruits and herbs into farms. **4.** Lack of information on marketing	▪ Conduct inventory of fruits a conduct resource use patter ▪ Plant promising trees/herbs ▪ Look into market value of bc herbs
Bushmeat?	Continued illegal hunting of animals in the forest. The issue touch on policy of KWS on hunting	Domestication of some animals Research to know quantities av harvesting levels Review of policy on hunting to r on the ground How to separate subsistence fr commercial use
Poverty	1. Low income e.g. low purchasing power 2. Increasing population around FAC 3. Unemployment 4. Low soil productivity 5. Animal damage (crops) e.g. elephants, baboons etc.	▪ Promote Non-consumptive e.g. increase beekeeping, b (within A.S.F). ▪ Diversification of income ge activities e.g. farming (outsi agroforestry. ▪ Empower the community to problem animals e.g. by dist thunder flashes and training community on its use to sca

		elephants, also involving the patrols. ▪ KWS to intensify patrols for animals. ▪ Reducing dependency on fc
Income generating activities (IGAs)	1. Marketing - Lack of places to sell products e.g. mangoes 2. Poor pricing of products e.g honey 3. Meeting Quality of product e.g butterfly species 4. Few income generating activities 5. Innovation (poor) - lack of value adding.	▪ Marketing information and s needed e.g. pricing, quality ▪ Increase and diversify incon activities. ▪ Training and sensitization o enterprising.
Gender	1. Gender disparity - women overburdened in household activities among others. 2. Girl child education poor 3. Early marriage of girls **4.** Male dominance in most activities	▪ Attitude change on all aspec livelihoods. ▪ Education, seminars and tra ▪ Women representation in A an equal ratio with men esp that aim at community deve ▪ Poverty can be dealt with b forest dependency by the cc

STRATEGIC FOREST MANAGEMENT PLAN

Thematic workshop on Biodiversity conservation

List of participants

	Name	Designation	Institution
1	Dr. H. Oyieke	Head of Research NMK, Nairobi	NMK
2	Mr. Tom Omenda	Research Officer, KEFRI Hqs	KEFRI
3	Mr. D. M. Mbithi	Senior Conservator of forest	FD
4	Mr. Marthias Mwavita	Warden, ASF	KWS
5	Mr. Karume	Malindi Green belt movement	CBO
6	Mr. Collins Jackson	FOAS	CBO
7	Mr. Athuman Mamu	FADA chairman	FADA
8	Mr. Julius Katana	FADA secretary	FADA
9	Mr. Richard Bennet	Watamu Conservation group	CBO
10	Mr. Paul Matiku	Nature Kenya	NGO
11	Mr. W. Ayiemba	Manager, Kipepeo	NMK
12	Ms Ann Robertson	Botanist	Research Associate, NMK
13		Chief, Roka	PA
14	Mr. Dickson Kahindi	Chief, Ngerenya Location	PA
15	Mr. Ali Didi	Councilor, Watamu ward	Local leader
16	Mr. Charles Passi	Councilor, Sokoke ward	Local leader
17	Mr. James Halle	WCK,Chairman Western zone	MOE
18	Mr. Barao	Secretary, DIFAAFA	CBO
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Position paper on subsistence use by Mr. T. Mbuvi

Introduction

Arabuko-Sokoke is located along the Kenyan coastline between Kilifi and Malindi districts. It has three distinct Vegetation zones. It is managed by the state through Forest Department (FD). The forest adjacent community (FAC) around Arabuko-Sokoke forest (ASF) is poor and any sustainable system of forest conservation and management in ASF has to address forest subsisting by FAC as one of the means of alleviating poverty. Poverty is one of the prime forces eroding biodiversity in Africa. Human use of biological resources is fundamental to survival in Africa. Biodiversity conservation must therefore be relevant to the needs of local people, and the community must be part of the decision making process (Biodiversity support Program 1993). ASF has been used for both commercial and subsistence use through a process that does not adequately address the specific requirements of FAC.

Forest subsisting in ASF has been going on before and after gazettement. A large portion of the subsisting benefits is got through illegal activities. Strategic forest management planning has to address the subsistence needs of the FAC if the biodiversity is to be conserved. This need not necessarily come from the forest as the subsisting zone could be established in their farms through on-farm tree growing and small mammal farming. Therefore the objective of the outline discussion on subsistence forest use is ***to devise ways of improving forest adjacent community livelihoods security and have them diversified through forest resource subsisting without compromising forest biodiversity***. The subsisting FAC are aware that the forest belongs to the state. In the country the FAC are estimated to be 2.9 million by 1994 (GoK 1994). A village like Dida has 2184 individuals. This number has been increasing for example though in 1991 the forest adjacent households were 235, three villages of Dida, Kahingoni and Kafitsoni now have 378 forest adjacent households. There are 51 villages around the forest, therefore the increasing population numbers requires sustainably agreed off take levels and a shift of emphasis on forest-based subsisting to intervention-zone based subsisting.

Subsistence use can be defined through;

- Type of product
- Value of product (commercial or subsistence)
- Market (sale) potential
- User status
- Product (volume and quantity)
- Skills (Bush meat, carving, herbalism)

The proposed subsisting zone.

Ideally this should be a defined forest area adjacent to the Forest adjacent community. This is not feasible because;

- Communities have different forest resource requirements and there is no forest type that will satisfy all their requirements,
- The forest products are plant type related. The Brachystegia trees do not provide building poles but will provide timber. Communities next to Brachystegia woodland will have to get building poles from the Cynometra woodland.
- Communities have different plant product requirements which can not be adequately met by the forest adjacent to them,
- Competing forest uses between Biodiversity and subsistence use and or eco-tourism.

Forms of subsisting

- Domestic subsisting through direct harvesting of fuel wood head lots, building poles, mushrooms etc.
- Commercial subsisting through wood carving, honey, butterfly farming and hunting for sale to neighbours or being employed by licensees.

Subsistence forest products

Firewood

The use of the forest by the forest adjacent community for heating, cooking and lighting ranges from 60% to over 90%. This is both for legally and illegally. Studies done in 1991 (Mogaka 1991) showed that communities move 1km to collect subsistence fuel wood, surveys done in 2000 showed that communities are now moving more than 2km (Participatory Forest Mapping Dida area 2000).

Table 1. Shifts in the Most Preferred fuel wood species between 1991 to 2001.

1991		2001	
Local Name	Botanical Name	Local Name	Botanical Name
Muhuhu	*Brachylaena huillensis*	Mugambo	*Manilkara sansibarensis*
Mfunda	*Cynometra webberi*	Mbambakofi	*Afzelia guanzensis*
Mkonga	*Balanites wilsoniana*	Mtandarusi	*Hymenia verucosum*
Mugurure	*Combretum schumanii*		
Mrihi	*Brachystegia speciformis*		
Mtsedzi	*Manilkara sulcata*		

Source: Mogaka 1991 Source: Per. Comm. Ndirangu 2001

In 1991 Mogaka estimated the forest adjacent households to be 235 with a mean household individuals of 13.5. The forest provided between 60% and 90% of the fuel wood requirements of the households interviewed.

Fuel wood use is location specific with the communities to the Eastern side of the forest relying more on the forest for fuel wood compared to the western side that has people with forests in their farms.

Grass

Grass use is in the form of grazing and or cutting grass by farmers. This is very common during the dry season and there have been suggestions of having Dairy farmers maintain the boundary and beat boundaries through cutting grass for their animals.

Fruits and Vegetables.

These are eaten as snacks and are a very useful during lean food times.

Table 2. Common Fruits of Arabuko-Sokoke Forest

Local Name	Botanical Name
Pepeta	*Dialium orientale*
Mango	
Tsedzi	*Manilkara sulcata*
Matongazi	*Ancylobotris petersiana*
Pudu/Fudu	
Vitoria	*Vitex furruginea*
Vitoria	*Ladorphia kirkii*
Ngambo	*Manilkara sansibarensis*
Virori	
Vipo	
Mkwaju	*Tamarindus indica*
Mudungatundu	*Flacourtia indica*
Mtundukula	*Ximenia Americana*
Murori	*Uvaria acuminata*
Madzada	*Uvaria lucida*
Mungambo (Ka-pehe)	*Mimosops fructicosa*
Mbugu Bafe	*Strychnos panganensis*
Mkone	*Grewia phylagiophylla*
Kitsapu	*Encephalatos hilderbrandtii*
Mudzipo	*Salacia madagarensis*
Mudziponzala	*Salacia elegans*

Though in 1991 there were no fruits that were being sold, by 2000 ASF had its fruits being sold as far as Kongowea Market in Mombasa

Vegetables

ASF has a lot of vegetables that the FAC harvest for use all year round. The vegetables are harvested free of charge.

Table 3. Vegetables of Arabuko-Sokoke Forest.

Local Name	Botanical Name	Seasonality	Commercialization Potential	Current Level of use	Domestication Potential
Thalakushe	*Tridax mulensis*	All year round	******	******	******
Mutsunga	*Asthesia sp.*	All year round	*		*
Kikosho		All year round	*		*
Munavu		All year round			*
Kadera		All year round			*
Kidemu		All year round			*
Logatsi		Rain Season			*
Kimbiri					*
Mbuyu	*Adansonia digitata*				*
Budzi					*
Mwangani					*
Mahako Gaazhere					*
Vitoria	*Ladorphia kirkii*		**********		
Virunji	*Nymphaea caerulea*				
Mkwaju	*Tamarindus indica*				

There will be need to address issues of acceptability, attitude towards indigenous vegetables, accessibility and availability in the local market.

Herbals

Lukando in 1991 identified 80 medicinal plants in ASF. The estimated number of herbalists in 1991 was 219. The use of medicinal plants for treatment goes ranges between 75 and 0ver 90%. This resource is available free to the community from the forest.

Poles

Poles used to built local houses are mostly got from the forest as even those with Casuarina are reluctant to use it for domestic use. The system of acquisition of poles through one licensed person who is urban based encourages communities

to poach. In 1991 43.5% of the Forest adjacent community expressed concern about scarcity of poles.

Table 4. The most preferred species for Poles

Local Name	Botanical Name
Mutsedzi	*Manilkara sulcata*
Muhuhu	*Brachylaena huilensis*
Mkone	*Grewia phylagiophylla*
Mtandarusi	*Hymenea verrucosum*
Mgurure	*Combrectum schumanii*
Mgambo	*Manilkara sansibarensis*

Wood Carving

This is an income-generating activity that has not been well addressed. It started in ASF in early 1900 and has been expanding since then. The Kamba community used to curve the parts of tress that were not good for timber. With intensified patrolling in 1990s they shifted their approach and by training the locals to came up with unfinished masks that are finished by the experienced carvers in Malindi. This patrolling adapting strategy shift is contributing to the livelihoods of the local people. In 1991 Mambo Sasa group was employing 30 families (Mogaka 1991).

This one forest product use that will require to be addressed in a very participatory approach (Social, economical and ecological concerns).

Table 5. Indigenous Wood Carving Trees

Local Name	Botanical Name
Muhuhu	*Brachylaena huillensis*
Mbirandu	*Oldfieldia somalensis*
Mguruwe	*Combrectum schumanii*
Mfunda	*Cynometra webberi*

Source: Per. Comm. Ndirangu 2001

Timber

The timber for subsistence use is got from the forest illegally and is both for domestic use and small quantities for sale in urban-based furniture industry and the construction and tourism industry.

Honey

Honey subsisting in the forest is very minimal with few traditional gatherers. The hanging of the Kenya Top Bar Hive (KTBH) in the forest has been affected by security concerns. In the PFM site in Kafitsoni there were 5 beehives that had been hanged in the forest. With formation of bee-keepers user groups the security issue will be resolved.

Butterflies

This is the most successful income-generating activity around ASF as shown by the table below.

Table 6 (a) Kipepeo Export earnings between 1994 to 2000.

Year	1994	1995	1996	1997	1998	1999	2000	**Totals**
No. of Pupae	10262	12593	18807	21823	21390	54939	56023	**195837**
US$ Earned	15888	18286	27163	41378	39397	105289	103659	**351060**

Table 6 (b) Community Earnings from Pupae sales between 1994 and 2000.

	1994	1995	1996	1997	1998	1999	2000	**Totals**
No.of Pupae	4315	7458	11408	15594	17182	36277	56023	**148257**
Ksh. Earned	263828	329905	538216	780480	882371	2726928	2806415	**8328143**

Mushrooms

There are nine different types of mushrooms eaten by the FAC

There is no commercial utilization of mushrooms but neighbours do share. This is because of the high perishability rate of the produce.

Bush meat

In 1991 Mogaka estimated the total number of small mammals trapped annually to be 576 450. The total cash value of elephant shrew meat was estimated to be 807100/=. These figures may be low now because patrols TEAMs

- Are reporting a rise in the number of traps being laid by the poachers with no signs of animals being trapped,
- The illegal timber splitters are relying more on mushrooms for stew than meat as was the case in the earlier days,
- The distance where traps were in 1991 of 1km has gone as far as the nature reserve,
- Currently there are few reported sightings of antelopes and the duiker.

The big forest animals, the elephant and the Buffalo are not hunted for their meat but mice form the bulk of the animals hunted from the forest.

Table 7. The Wild meat Animals hunted in Arabuko-Sokoke forest

Local Name	Common Name	Scientific Name
Udzora	Mice	
	Cats	
Yonda	Baboons	
	Rabbits	
	Birds	
Nguruwe	Bush pigs	*Potamochoerus porcus*
Nugu	Porcupine	
Kanga	Guinea fowls	
Sungura	Rabbits	
	Mongoose	
Panya	Rats	
Kima/Tsala	Sykes Monkey	*Cercopithecus albogularis*
Pala	Duikers	
Nyani	Yellow Baboon	*Papio cynocephalus*
Kuhe	Giant Gambian Rat	*Cricetomys gambianus*
Fugu	Golden Rumped Elephant Shrew	*Rhychocyon Chrysopgus*
Fungo	African Civet	*Vierra civetta*
Paa	Suni	*Neotragus moschatus*
Tali	Spiny mouse	*Acomys dimidiatus*
Tsanje	Four toed Elephant Shrew	*Petrodromus tetradactlus*
Kulungu	Waterbuck (common)	*Kobus ellipsiprymnus*

Source: Mogaka 1991 and Per. comm. Alex Mwalimu

Table 8 Edible Birds of ASF

Local Name	Common Name	Scientific Name
Kolobilo	Black-headed oriole	*Oriolus lanatus*
Msanya Randu	Yellow bill	*Ceuthmochares aereus*
Mwasaku	Common bulbul	*Pycnonotus barbatus*
Mwambeyu	Black-headed Tchagra	*Tchagra australis*
Bata Maji	White faced Whistling Duck	*Dendrocygma viduata*
Giya	Red eyed dove	*Streptopelia semiforauata*
Puji	Tambourine Dove	*Turtur tympanistria*
Karengenze	Crested Francolin	*Francolinus sephaena*
Kanga	Helmeted Guineafowl	*Numida meleagris*
Kozi	Black-bellied Starling	*Lamprotornis corruscus mandamus*

Source: Per. Comm. Alex Mwalimu.

Water

There are several water pools in the forest and the community relies on these as sources of water.

Shamba System

This is an economical and technically successful method of establishing plantations. Piloting on this management system is being initiated in Gede this year after it was discontinued in 1993

Subsistence zone definition criteria

Securing the future of the forests is of paramount importance to each of the stakeholders and seeking options to guarantee the existence of the forest must involve all of them

The criteria used to define this zone could be

- Availability of subsisting forest products
- Accessibility to the forest subsisting products
- Trade off from other competing uses like biodiversity conservation and eco-tourism

Cases of domestic use tending towards commercial

There are some subsisting activities in ASF that are increasingly becoming commercial in the sense that they are being harvested for commercial use/sale and the harvested volumes are large and the money value is also big. These exemplified by:-

- Herbal medicine harvests by established herbal clinics in Nairobi and other urban based herbal practitioners notably Dr Githae and Makini Herbal clinics.
- Harvesting of Fruits for regional markets taking the example of *Ladorphia kirkii* Market survey in 2000.

Table 9 Preliminary Market survey for *Ladorphia kirkii*

Table 9 (a) The average wholesale price of *Ladorphia kirkii* fruit[4] in relation to distance from the forest and season.

Market point	Forest Edge	Gede	Marereni	Malindi	Kilifi	Kongowe a
Distance from forest edge	O Kilometre s	5 Kilometre s	40 Kilometre s	25 Kilometre s	30 Kilometre s	125 – 110 Kilometre s
Start of Ripening	70	120	300	300	400	1000
Peak Ripening	50	100	250	300	400	800
End of Ripening	70	120	300	300	400	1000

Source: Mbuvi and Muthini 2000.

Table 9 (b) The retail price of *Ladorphia kirkii* fuits in relation to distance from the forest and Season

Market point	Forest Edge	Gede	Marereni	Malindi	Kilifi	Mombas a
Distance from Forest Edge	O Kilometre s	5 Kilometre s	40 Kilometre s	25 Kilometre s	30 Kilometre s	110 to 125 Kilometre s
Start of Ripening	50 cents per fruit	50 cents per fruit	1 to 2 shillings per fruit	1 to 2 shillings per fruit	1 to 2 shillings per fruit	50 to 60 shillings per 2kg bag
Peak Ripening	-	1 to 2 shillings per fruit	1 to 2 shillings per fruit	1 to 2 shillings per fruit	1 to 2 shillings per fruit	60 to 100 shillings per 2kg bag
End of ripening	50 cents to 1 shillings per fruit	1 to 2 shillings per fruit	2 to 2.50 shillings per fruit	1 to 3 shillings per fruit	2 to 3 shillings per fruit	80 to 100 shillings per 2kg bag

Source: Mbuvi and Muthini 2000.

Issues

- Will subsisting be allowed in all community forest adjacent areas?
- Does the forest have adequate subsisting resource (plant and wild animals)?

[4] The quantity of the fruit is based on 1 full bale of maize flour bag.

- Management responsibilities should be shared between all the stakeholders. How far should this extend? Last year the Government got 98503/= revenue from ASF against the community getting 3520635/=. Should the communities continue benefiting without directly contributing towards the management of the forest!
- Does a framework exist that will allow dynamism in forest management?
- Attitude change to facilitate multiple stakeholder participation in natural resource management
- Policy and legal mechanism for participatory forest subsisting,
- Sustained sustainable resource use/level of sustainable extraction,
- Increased technical and extension support to farm forestry needs to be increased because Farm forestry will take over substantial portion of forest subsisting functions from the indigenous forests.
- Illegal subsisting especially on wild meat and wood carving,
- Increasing subsisting pressure on the forest
- Direct conflict between subsisting needs and conservation needs.
- Existing control mechanisms are being over-stretched and need evaluation thus the to work with the local people
- Equitability in resource allocation through community based organizations
- Competing land uses leading to demand for excision.

Strategic options

- Facilitate on farm tree growing. This requires technical and extension services support that is coordinated in a framework of pluralism.
- Provide appropriate incentives to encourage all participants to become involved with farm forestry,
- Reliable access to subsisting forestry resources,
- Proper documentation and valuation of ASF Non-Timber Forest Products
- Undertake detailed market studies
- Legitimize forest use/benefits through Participatory forest management
- Diversify forest subsisting products through mushroom growing. University of Nairobi (UoN) has the skills to undertake the feasibility studies (KEFRI, NMK, UoN).
- Negotiation and conflict management
- Development of community based forest subsisting guidelines and management plans,
- Shift of approach from protecting the forest from the community to working with the community

- Facilitate the establishment of a intervention zone where forest subsisting will shift to.

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