



**Ministry of Natural Resources and Tourism
Forestry and Beekeeping Division**

**Eastern Arc Mountains Conservation Strategy and
Action Plan**

Version September, 2007

Forestry and Beekeeping Division
P.O. Box 426, Dar-es-Salaam.
Telephone (+255) 0222126844 or 2130091

Web Eastern Arc: www.easternarc.or.tz
Web FBD: www.nfp.co.tz/html/

SEPTEMBER, 2007.



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Acknowledgements

The preparation of this Strategy and Action Plan for the conservation of the Eastern Arc Mountains was commissioned by the Forestry and Beekeeping Division (FBD) through the project ‘Conservation and Management of Eastern Arc Mountains Forests (CMEAMF)’. This project was funded by the Global Environment Facility (GEF) through the United Nations Development Programme (UNDP), with additional support to the strategic planning process from the WWF network.

We thank all the managers of the Eastern Arc Mountains for their considerable input of ideas, which form the basis of this document. In particular we would like to thank the foresters working for the four Regional Catchment Forests Programme Offices, the communities and the local government staff of the 14 Districts and five Regions within the Eastern Arc, and local and international NGOs that work in the region.

This strategy and action plan is also based on the eight thematic strategies that have been developed through CMEAMF funding (protected area network, fire reduction, sustainable forest use, carbon ecological services, water ecological services, monitoring, biodiversity conservation, and information, education and awareness), which are all available on www.easternarc.or.tz. The document also builds upon the work undertaken to develop the Eastern Arc Mountains Conservation Endowment Fund (www.easternarc.or.tz), on projects funded by the Critical Ecosystem Partnership Fund (CEPF) (www.cepf.net), and on research undertaken in the Eastern Arc Mountains by many hundreds of researchers over several decades.

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PREFACE

Text prepared for signing by the Minister of Natural Resources or at least the Director of FBD. Can Dr K make the draft of this?

ACRONYMS

This needs to be added. Can people at the Trust Fund do this, or should I?

SUMMARY

Conservation and Management of the Eastern Arc Mountain Forests (CMEAMF) is a project of the Ministry of Natural Resource and Tourism, Forestry and Beekeeping Division. The project will last for 5 years (2004-2008) and one of the main outputs is the development of a holistic conservation strategy for the Eastern Arc Mountains on behalf of the Ministry.

This document summarises the strategy development process and presents the main results of that process in terms of agreed strategies, objectives, activities and ways to monitor implementation. It also outlines how the strategy links to the work of the Eastern Arc Mountains Conservation Endowment Fund (EAMCEF) and the Catchment and Mangroves Forest Management Programme of the Forestry and Beekeeping Division. However, the strategy is certainly not only for the use of these agencies; it aims to present a holistic conservation framework, outlining what needs to be done to ensure sustainable conservation in the Eastern Arc. As such it is a strategy for all players interested in the conservation of the high biodiversity forests of the Eastern Arc, and the ecosystem services that they provide to ensure the economic development of the Tanzanian nation.

This strategy and action plan has been developed in Tanzania by many stakeholders using three main approaches:

- 1) Twenty stakeholder workshops undertaken across the entire Eastern Arc region, at all 14 Districts, for each of the 5 regions, and for technical staff in various disciplines.
- 2) Six consultancies that assessed the current situation on the ground (the baseline).
- 3) Eight consultancies that developed thematic strategies aiming to provide answers to issues of particular concern in the Eastern Arc region.
- 4) Three strategy development and ratification workshops.

Stakeholders process

To gather stakeholder inputs for the development of this strategy Forestry and Beekeeping Division (CMEAMF) undertook 14 District meetings and four Regional meetings, and worked with experts from technical agencies, to define the major problems that need to be tackled in order to improve the conservation situation across the Eastern Arc. Thousands of people, including representatives of villages and Ward leaders from across the Eastern Arc were involved with this process. Key conservation issues identified during these consultation processes were:

- a) The prevalence of destructive wild fires
- b) Widespread poverty at all levels and a lack of resources for management
- c) A lack of understanding and appreciation of the values and importance of the Eastern Arc
- d) Poor availability and understanding of policies and laws
- e) Unsustainable tree harvesting despite long term harvesting bans
- f) Illegal mining for gold and other minerals
- g) Poor agriculture, charcoal production and livestock husbandry practices

Consultancy process

To further inform the development of the strategy FBD (CMEAMF) also commissioned six studies to provide data on the status of critical aspects of the Eastern Arc Mountains. The studies also contain an important baseline against which the impact of implementation can be measured. The baselines studies commissioned were as follows:

- a) Biodiversity (covering forest and non-forest biodiversity values).
- b) Forest area (covering the past and current area of forest).
- c) Forest condition (covering forest condition, threats, and reserve management effectiveness scores)
- d) Staffing, equipment and funds available for management.
- e) Education and Awareness (covering knowledge, attitude and practices).
- f) Hydrological Values (covering water flows, water quality, and rainfall regimes).

For the most critical issues identified during the local stakeholder process and within the various baseline studies, a further eight specific consultancies were also undertaken. These provide precise answers on what Tanzania needs to do to tackle the following issues:

- a) Providing sufficient and relevant information, education and awareness on the Eastern Arc.
- b) Biodiversity conservation within the Eastern Arc.
- c) Monitoring natural resources in the Eastern Arc.
- d) Developing a comprehensive protected area network for the Eastern Arc.
- e) Working towards sustainable forest use in the Eastern Arc.
- f) Ensuring appropriate fire reduction in the Eastern Arc.
- g) Developing payments for water ecological services in the Eastern Arc.
- h) Developing payments for carbon ecological services in the Eastern Arc.

Strategy development

A three step process was used to finalize the ‘Eastern Arc Mountains Conservation Strategy and Action Plan’.

First, an initial planning meeting was held on the 21-23 June 2006 in Morogoro to define the conservation vision, outline the main conservation targets that need to be conserved in the Eastern Arc region, and assess the threats¹ that are impacting on these targets. The workshop was attended by 33 people that included a range of stakeholders, including representatives from central government, local government, NGOs and parastatals.

Second, a facilitated meeting (with the support of WWF and the Foundations of Success organisation from the USA) was held on the 15-20th October in Kibaha. For each of the threats impacting the conservation targets in the Eastern Arc region, a series of implementation strategies were developed to try and mitigate that threat. These implementation strategies were fleshed out through the identification of key objectives and activities. This meeting included a variety of stakeholders, with 25 people attending during the 5 day period.

Finally a meeting was held on the 15-16th June 2007 to discuss the details of the strategic plan and to refine indicators and develop monitoring matrixes for each of the implementation strategies. A further 30 people attended this meeting, representing various stakeholders from across the Eastern Arc region.

The principal implementation strategies that aim to tackle key threats to the Eastern Arc Mountains ecosystem are as follows:

¹ Below many of identified threats are ‘root causes’ which are deeper seated and more problematic issues that require greater efforts to solve – these include poverty, poor governance and corruption, and lack of training and human capacity.

- Fire control strategy
- Illegal timber strategy
- Non-timber forest products strategy
- Mining strategy
- Hunting strategy
- Invasive plant species strategy
- Pet trade strategy

There are also a number of cross cutting issues that do not address key threats, but which are regarded as critically important issues to address. These are presented in a separate section of the report and are as follows:

- Water supply and hydrological service strategies
- Information, education and awareness strategies
- Sustainable financing strategies
- Climate change mitigation strategies

Implementation

This document proposes a mechanism for the coordination and management of the implementation of the Eastern Arc Mountains Strategy is proposed – that of a multisectoral committee operating at national level and coordinating the implementation of the various elements of the projects work. The key stakeholders in this committee would be the Forestry and Beekeeping division of the Ministry of Natural Resources and Tourism, the Ministry of Water and Livestock, the Ministry of Agriculture, the Vice Presidents Office (Environment), and the Prime Ministers Office- Regional and Local Government. Other members might include the large development partners supporting conservation in the Eastern Arc region, including multilateral and bilateral agencies and international and national NGOs.

Some elements of this ‘Eastern Arc Mountains Strategy and Action Plan’ have already been initiated on the ground – in particular that involved with the enhancement of the protected area network and improving the level of awareness on forest conservation issues. Funding for this implementation has come from within the CMEAMF project itself, from funds provided to FBD by the World Bank (Tanzania Forest Conservation and Management Project), from funds provided by the Critical Ecosystem Partnership Fund, and from NGOs such as WWF and the Tanzania Forest Conservation Group (TFCG). Results of this implementation are captured in the quarterly and annual progress reports for CMEAMF that are posted on the internet at www.easternarc.or.tz.

Further implementation of this strategy and action plan would achieve much for the conservation of the Eastern Arc Mountains, their forests, the biodiversity they contain and the ecosystem services that the forests provide to the people of eastern Tanzania.

Table of Contents

I. BACKGROUND	13
2. DESCRIPTION OF THE STRATEGY AREA.....	14
WHAT IS THE EASTERN ARC?	14
WHAT ARE THE GLOBAL BIODIVERSITY VALUES?	15
II. OUR VISION FOR CONSERVATION IN THE EASTERN ARC MOUNTAINS	17
EASTERN ARC MOUNTAINS CONCEPTUAL MODEL	19
III. TARGETS AND GOALS FOR THE EASTERN ARC MOUNTAINS CONSERVATION STRATEGY AND ACTION PLAN.....	20
IV. PRIORITIZATION OF THREATS AND SELECTION OF STRATEGIES	26
4.1 THREAT PRIORITIZATION	26
4.2 STRATEGY SELECTION PROCESS.....	27
V. STRATEGIES TO ADDRESS FIRE	29
5.1 ANALYSIS OF THE ROOT CAUSES OF THIS THREAT	29
5.2 STRATEGY TO RAISE AWARENESS OF FIRE CONTROL.....	31
VI. STRATEGIES TO ADDRESS AGRICULTURE AND ILLEGAL GRAZING.....	34
6.1 ANALYSIS OF THE ROOT CAUSES OF THESE THREATS	34
6.2 STRATEGY TO GAZETTE IMPORTANT UPPER CATCHMENT AREAS	35
6.2 STRATEGY TO GAZETTE IMPORTANT UPPER CATCHMENT AREAS	36
6.3 STRATEGY FOR MULTISECTORAL COLLABORATION ON THE MANAGEMENT OF THE EASTERN ARC MOUNTAINS	40
6.4 STRATEGY TO SUPPORT LAND USE PLANNING AT THE VILLAGE LEVEL.....	43
VII. STRATEGIES TO ADDRESS ILLEGAL LOGGING.....	46
7.1 ANALYSIS OF THE ROOT CAUSES OF THIS THREAT	46
7.2 STRATEGY TO PROMOTE EFFECTIVENESS OF PARTICIPATORY FOREST MANAGEMENT TO ADDRESS ILLEGAL LOGGING	48
7.3 STRATEGY TO PROMOTE ALTERNATIVE ECONOMIC ACTIVITIES TO REDUCE ILLEGAL LOGGING/REMOVAL OF TIMBER.....	52
VIII. STRATEGIES TO ADDRESS COLLECTION OF FIREWOOD AND BUILDING MATERIALS.....	55
8.1 ANALYSIS OF THE ROOT CAUSES OF THIS THREAT	55
8.2 STRATEGY TO EXPAND VILLAGE LAND, COMMUNITY BASED AND PRIVATE FOREST RESERVES.....	56
8.2 STRATEGY TO EXPAND VILLAGE LAND, COMMUNITY BASED AND PRIVATE FOREST RESERVES.....	57
MONITORING PLAN TO EXPAND VILLAGE LAND, COMMUNITY BASED AND PRIVATE FOREST RESERVES	58
IX. STRATEGY TO ADDRESS MINING.....	60
9.1 ANALYSIS OF THE ROOT CAUSES OF THIS THREAT	60
9.2 STRATEGY TO STRENGTHEN MANAGEMENT CAPACITY AND RAISE AWARENESS TO ADDRESS SMALL-SCALE MINING	62
X. STRATEGY TO ADDRESS HUNTING AND POACHING.....	65
10.1 ANALYSIS OF THE ROOT CAUSES OF THIS THREAT	65
10.2 PROMOTE HUNTING CONTROL AND MANAGEMENT WITHIN JOINT MANAGEMENT AGREEMENTS	67
XI. STRATEGY TO ADDRESS INVASIVE SPECIES.....	70
11.1 ANALYSIS OF THE ROOT CAUSES OF THIS THREAT	70
11.2 STRATEGY TO REDUCE THE EXPANSION OF INVASIVE SPECIES.....	72
XII. STRATEGIES TO ADDRESS UNSUSTAINABLE COLLECTION FOR THE PET TRADE	75
12.1 ANALYSIS OF THE ROOT CAUSES OF THIS THREAT	75
12.2 STRATEGY FOR REDUCING IMPACT OF PET TRADE ON ENDEMIC AND THREATENED SPECIES.....	76

12.2 STRATEGY FOR REDUCING IMPACT OF PET TRADE ON ENDEMIC AND THREATENED SPECIES	77
CROSS CUTTING ISSUES.....	80
DECLINING WATER QUANTITY AND QUALITY	80
INSUFFICIENT AWARENESS	82
INSUFFICIENT FINANCE.....	84
ADVERSE CLIMATE CHANGE	86
MANAGEMENT AND IMPLEMENTATION	88
KEY DOCUMENTS PRODUCED BY CONSERVATION AND MANAGEMENT OF THE EASTERN ARC MOUNTAIN FORESTS (CMEAMF).....	89

I. Background

The Eastern Arc Mountain are of global importance for their biological values and of national importance to Tanzania for their role in providing water to millions of Tanzanians and for the hydropower stations that generate more than 50% of the electricity in the country. The forests also store significant amounts of carbon, thus acting as a buffer against global warming and climate change.

The Tanzanian government has recognized the importance of the Eastern Arc mountains for national development and has facilitated the development a holistic strategy for the conservation of biodiversity, water supply and soils. To further support the conservation in the Eastern Arc, the Government of Tanzania has assisted the creation of a conservation ‘Endowment Fund’, which will provide long term finance for conservation efforts in the area. This independent body is called the ‘Eastern Arc Mountains Conservation Endowment Fund’ and became fully operational in 2006 – see www.easternarc.or.tz.

Coordinated by the Forestry and Beekeeping Division of the Ministry of Natural Resource and Tourism, the project that has developed the overarching conservation strategy for the Eastern Arc Mountains is called ‘Conservation and Management of the Eastern Arc Mountain Forests (CMEAMF)’ – an initiative of the Forestry and Beekeeping Division of the Ministry of Natural Resources and Tourism that has been funded by the Global Environment Facility through the United Nations Development Programme.

This project has undertaken a series of meetings at Village, District and National levels with many stakeholders in the management of the Eastern Arc Mountains. A variety of consultancies have also been commissioned to provide answers to questions of particular relevance to the management of this area.

This document contains a synthesis of the materials developed by this project, with the final stages of the work undertaken by the core CMEAMF management team. It outlines what needs to be addressed to improve the conservation of the Eastern Arc Mountains in the long term.

2. Description of the Strategy Area

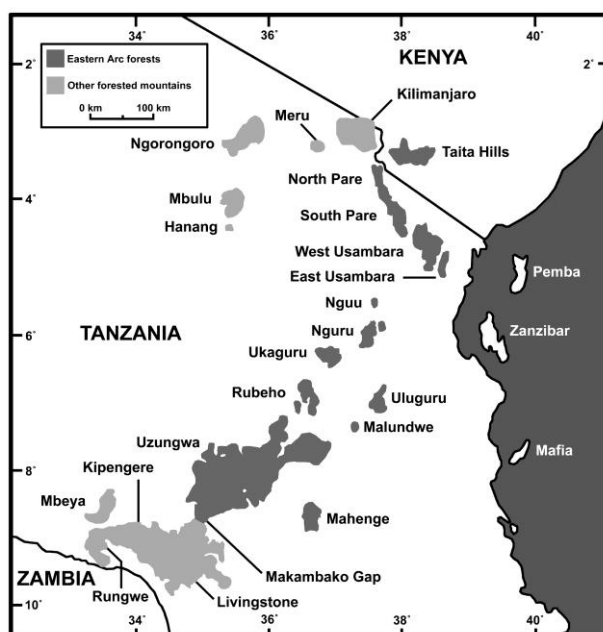
What is the Eastern Arc?

The Eastern Arc is a chain of ancient mountains covered by rain forests and grasslands in Tanzania and Kenya. Scientists believe that forest has survived on the Eastern Arc Mountains for over 30 million years, and there are ancient connections to the forests of the Congo Basin and West Africa, and even to Madagascar. The Eastern Arc range comprises 12 Mountain blocks in Tanzania and one in Kenya – with the Tanzanian blocks scattered across 14 administrative Districts. In this document we focus attention on the Eastern Arc Mountain blocks of Tanzania, as the strategy has been developed within the structures of the Government of Tanzania.

The 12 Eastern Arc Mountain blocks in Tanzania stretch across 14 administrative districts

Mountain Blocks	District
North Pare	Mwanga
South Pare	Same
West Usambara	Lushoto, Korogwe,
East Usambara	Korogwe, Muheza
Nguu	Kilindi
Nguru	Mvomero
Uluguru	Morogoro and Mvomero
Ukaguru	Kilosa
Rubeho	Mpwapwa and Kilosa
Malundwe	Mvomero
Udzungwa	Kilombero, Kilolo and Mufindi
Mahenge	Ulanga

Figure 1. Location map of the Eastern Arc Mountains



What are the global biodiversity values?

The biological values of the Eastern Arc Mountains are truly exceptional in global terms as has been recognized by many organizations, for example by Conservation International, World Wide Fund for Nature (WWF), Birdlife International and the World Conservation Union (IUCN).

Current knowledge shows that 97 species of vertebrate animal are confined to (endemic) to the Eastern Arc Mountains, split as follows: 10 mammal, 20 bird, 29 reptile and 38 amphibian species. In addition, another 71 species are only found in the Eastern Arc and other nearby forest habitats. These are termed near-endemic species. Seventy two of the endemic or near-endemic vertebrates are threatened by extinction (8 Critical, 27 Endangered, 36 Vulnerable), with an additional seven wide ranging threatened species being present. This is one of the highest concentrations of threatened species in the world and shows that the Eastern Arc is one of the places where species could disappear from the face of the earth in coming years. Indeed one species, the Kihansi spray toad (*Nectophrynoides asperginis*), seems to be on the edge of extinction in the wild.

It is more difficult to provide a precise estimate for the number of endemic plants in the Eastern Arc. However, botanical experts have identified at least 68 endemic tree species and hundreds of species of endemic shrubs and herbs, with the total number of endemics likely to reach 1,500 species. The Uluguru mountains alone has more than 135 plant species that are confined to that single mountain block, and 100 or more endemic species are also known on the East and West Usambara, and Udzungwa ranges. The number of threatened plant species in the Eastern Arc is similarly difficult to calculate precisely, but a recent estimate is that around 1,000 plant species found in the Eastern Arc are threatened with extinction.

Importance of different Eastern Arc blocks

By adding up of the number of endemic and near-endemic species in each mountain block, it is possible to obtain simple estimation of biological value and priority for conservation (Table 1). Based on current knowledge three blocks are of the highest importance: Uluguru, East Usambara and Udzungwa. The Nguru and Rubeho come close behind in this ranking. These five blocks are the most important for conservation attention, although every part of the Eastern Arc has high value in global terms, and the lack of study in some areas means that rankings may change in the future as more work is completed.

More still to discover

To illustrate that we do not have complete knowledge of these mountains, a new species of large monkey- a mangabey (*Rugwecebus kipunji*) was described in 2005 from the Udzungwa Mountains and the Southern Highlands further south. In addition, a new species of shrew (*Congosorex phillipsorum*) was described during 2005 from the highest parts of the Udzungwa mountain forest: and three new bird species have been named from various mountains in the past five years, along with five new species of amphibian. At least another 10 new species of vertebrates will be described in the next few years. It seems that detailed study of each mountain block will continue to discover additional species that are unknown to science.

Major gaps in biological knowledge remain in the Eastern Arc, with several mountain blocks being almost unknown for anything other than birds. Over the past three years, work funded mainly by the Critical Ecosystem Partnership Fund (CEPF) has investigated the poorly known North Pare, Nguu, Nguru, Rubeho, Mahenge, Ukaguru and southern Udzungwa blocks. The results of these studies are now being made available as reports (see www.easternarc.or.tz and www.cepf.net).

Table 1. Numbers of endemic and near-endemic vertebrate animals and trees in different Eastern Arc Mountain blocks (data from November 2005)

Mountain block	Approximate forest area remaining (hectares)	Single block endemic vertebrates (one mountain only)	Eastern Arc endemic vertebrates (one to 13 blocks)	Near endemic vertebrates (also coastal forest, Southern Highlands, or Kilimanjaro area)	Number of Eastern Arc endemic trees
Taita (Kenya)	300	6	8	11	8
North Pare	2,500	0	5	12	0
South Pare	13,540	2	8	19	1
West Usambara	26,500	5	22	48	27
East Usambara	25,800	4	35	78	40
Nguu	24,900	0	9	27	6
Nguru	34,000	0	20	52	25
Uluguru	27,000	14	45	82	26
Ukaguru	17,400	1	10	27	4
Rubeho	47,400	2	12	35	0
Malundwe	450	0	0	2	4
Mahenge	1,940	0	2	11	5
Udzungwa	102,400	17	41	96	37

II. Our Vision for Conservation in the Eastern Arc Mountains

The June 2006 strategic planning workshop developed a ‘vision’ for the conservation of the Eastern Arc mountains. Meeting participants were divided into four groups according to the type of institution they represented – NGOs, local government, central government and parastatals. Each group developed a vision of how they would like to see the Eastern Arc mountains in 50 years’ time. Having examined each vision, the main elements were extracted in plenary and developed into the overall vision. The final vision for the Eastern Arc mountains is:

EASTERN ARC CONSERVATION VISION

We envisage that the unique biodiversity values of the Eastern Arc Mountain forest ecosystems of Tanzania are conserved, sustainably managed and providing equitably shared benefits and services for local, national and international stakeholders

It is hoped that this vision will provide guidance for the work that is undertaken in the Eastern Arc Mountains over the coming decades.

The Eastern Arc Mountains Conceptual Model

The conservation planning meeting in October 2006 developed a detailed conceptual model for the Eastern Arc Mountains. This model identifies the main conservation targets, the direct threats that they face, and the various indirect threats and opportunities that contribute to the manifestation of the threat impacting on the conservation targets.

Conservation targets. The group defined the following as the main conservation targets in the Eastern Arc Mountains:

- Forest (divided into upper montane, montane and sub-montane forest types as these face different threats).
- Montane grasslands
- Montane wetlands
- Water resources
- Endemic species
- Wide ranging threatened species
- Species under trade

Threat ranking. A reassessment of the previous threat ranking exercises undertaken by Forestry and Beekeeping Division, agreed upon the following main threats to the conservation targets identified above:

Threats Ranked High (red on conceptual diagram)

- Uncontrolled fire
- Conversion of natural habitats to agriculture

Threats ranked medium (orange on conceptual diagram)

- Unsustainable collection of firewood and building materials
- Illegal logging

Threats ranked low (green on conceptual diagram)

- Unsustainable hunting/poaching
- Inappropriate mining practices
- Illegal grazing

Drivers

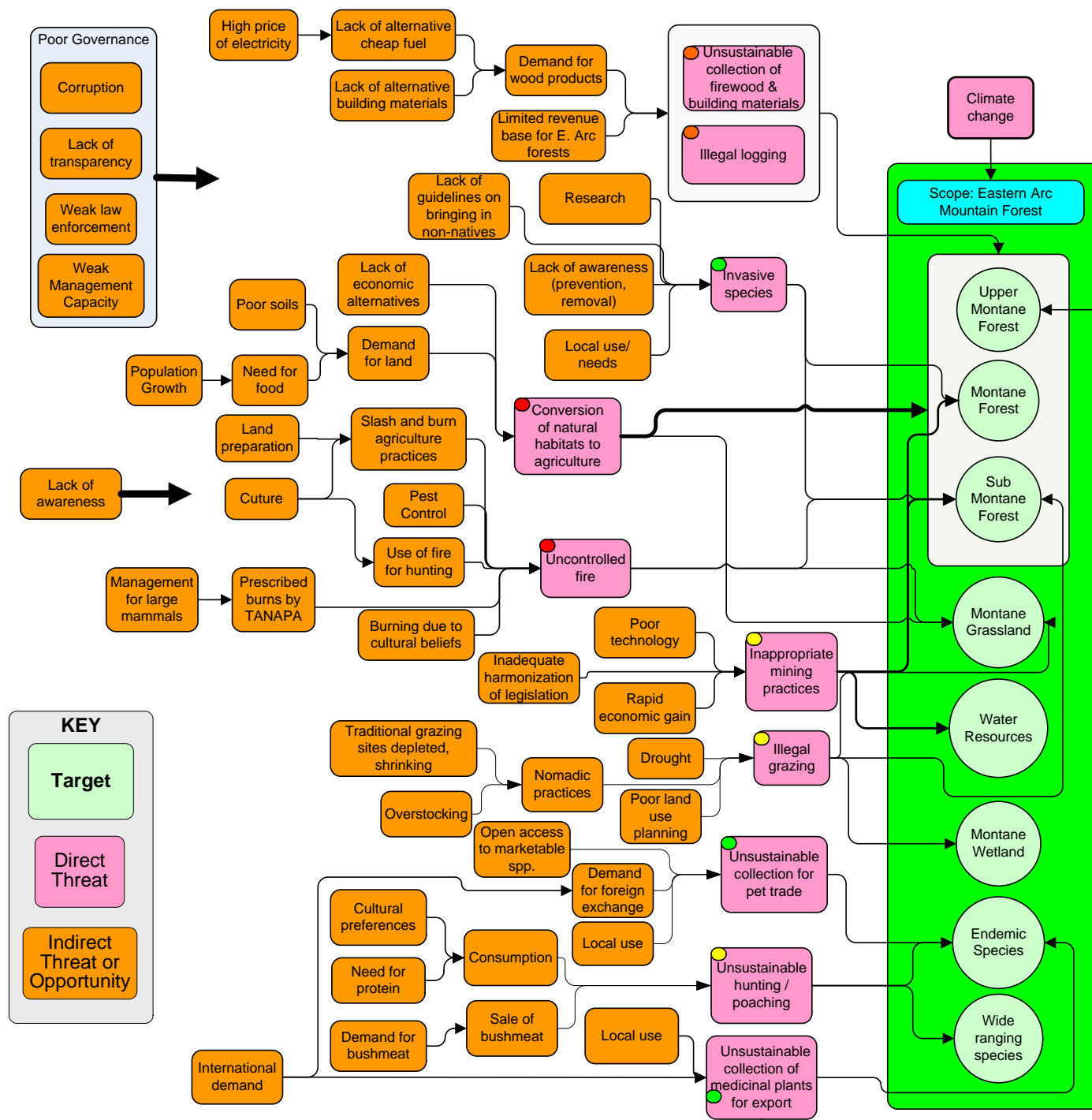
Lying behind the threats facing to the conservation targets in the Eastern Arc Mountains are a number of drivers or root causes. The drivers/root causes identified at the October 2006 planning meeting were:

- Poverty
- Corruption
- Lack of transparency
- Weak law enforcement
- Weak management capacity
- Lack of awareness
- High international and national demands
- Population growth
- High price of electricity

These drivers are the most difficult issues to address in any conservation strategy, but their existence has a fundamental bearing on whether the conservation vision for the Eastern Arc Mountains can be achieved through implementing the agreed strategies. As such these drivers always need to be considered as any conservation strategy is implemented.

Eastern Arc Mountains Conceptual Model

This diagram is a pictorial representation of the main drivers that result in threats that impact on the conservation targets that have been identified as important within the Eastern Arc Mountains Region. The diagram should be read left to right, with the conservation targets on the right, the threats next to the left, and the main drivers and indirect threats further to the left.



III. Targets and Goals for the Eastern Arc Mountains Conservation Strategy and Action Plan

The targets identified in this conservation strategy and action plan are primarily related to habitats and species values of the mountains. However another target also relates to the provision of water services from the Eastern Arc Mountains, which is the main ecosystem service that this area provides for people. Below, the targets are described, together with detailed goals for each of the targets – based upon the baselines that have been developed by the Forestry and Beekeeping Division (CMEAMF).

Target 1: Upper Montane Forest (above 2,000 m)

*Goal: by 2017, 100% of remaining *upper montane forest is effectively conserved*

*Based on baseline data from the period 1999 – 2003 the total amount of upper montane forest is around 230,850 ha

Target 2: Montane Forest (from 1,500 to 2,000 m)

*Goal: by 2017, 100% of remaining *montane forest are effectively**conserved and connectivity among major forest patches***is enhanced*

*Based on baseline data from 1999-2003 the total of montane forest is around 2,000,530 ha
**Intact tree canopy with full set of species including representative endemic species; decreasing levels of disturbance
***Ulugurus (Bunduki gap, Kitumbaku Hills), East Usambaras (Derema, Nilo-Kambai/Segoma), Udzungwas (Uzungwa Scarp to Matundu/Iyonde)

Target 3: Sub-Montane Forest (from 800 to 1,500m)

Goal: by 2017, at least 80% of remaining sub-montane forest is effectively ** conserved*

*Based on baseline data from 1999 – 2003 the total area of sub-montane forest is around 1,026,683 ha
**Intact tree canopy with full set of species including representative endemic species; decreasing levels of disturbance

Target 4: Montane Grasslands

Goal: By 2017, representative samples of the montane grassland in the Eastern Arc mountains are effectively **conserved.*

*Baseline data on the extent of montane grasslands of the Eastern Arc are not compiled, but they occupy extensive areas of some of the blocks. Example montane grasslands are conserved in the Uluguru (Uluguru South Forest Reserve) and Udzungwa (e.g. Mufindi Forest Reserves, West Kilombero Scarp Forest Reserve, Udzungwa Mountains National

Park) ranges. Unprotected grasslands exist mainly in the Udzungwa mountains, but also in the Rubeho mountains.

**Full set of species, total biomass, ground cover

Target 5: Montane wetlands

Goal: By 2017, representative samples of montane wetlands in the Eastern Arc mountains are effectively **conserved.*

*Baseline data on the montane wetlands of the Eastern Arc are not compiled, but they only occupy small areas on the various mountains. Examples of montane wetlands are conserved in the Uluguru (Uluguru South Forest Reserve), Udzungwa (Kisinga Lugaru and West Kilombero Scarp Forest Reserves and Udzungwa National Park in particular). Unprotected wetlands exist mainly in the Udzungwa mountains.

**Full set of species, water quality, vegetation cover

Target 6: Water Resources (streams, rivers, catchments areas)

Goal: By 2017, the streams, rivers and wetlands of the Eastern Arc Mountain have stable hydrology (within the natural range) and water quality is within acceptable standards

Target 7: Endemic species

Goal: By 2017, all endemic species are effectively conserved.*

*Endemic species of vertebrates and plants are listed in Appendix 1 and Appendix 2

Target 8: Wide-ranging threatened species

Goal: By 2017, wide ranging threatened species populations are either increasing or fluctuating within normal variation within the Eastern Arc region.*

*these species include elephant and lion. **A list of threatened species is provided in Appendix 3.**

Target 9: Species under trade

*Goal: By 2017, the trade in Eastern Arc species * is effectively controlled*

Trade includes various species of chameleon, African violet, large beetle and cycad. It also targets more specific species – such as Livingstone’s turaco (*Tauraco livingstonii*), African sandalwood (*Osyris lanceolata*), khat (*Catha edulis*) and African cherry (*Prunus africana*).

Monitoring Plans for each of the Goals

These outline plans indicate what should be done to measure the achievement of the targets identified above

Goal for Upper Montane Forest: By 2017, 100% of remaining upper montane forest is effectively conserved					
<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Forest cover above 2,000m altitude	Remote sensing and altitudinal analysis	Every 5 years	Depending on funds. For 2008 CEPF and FBD have funds	Sokoine University GIS lab or Institute of Resource Assessment in Dar es Salaam	A technically demanding and potentially expensive task

Goal for Montane Forest: By 2017, 100% of remaining upper montane forest is effectively conserved and connectivity among major forest patches is created.					
<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Forest cover between 1,500 and 2,000m altitude	Remote sensing and altitudinal analysis	Every 5 years	Depending on funds. For 2008 CEPF and FBD have funds	Sokoine University GIS lab or Institute of Resource Assessment in Dar es Salaam	A technically demanding and potentially expensive task
Existence of forest corridors at Bunduki (Uluguru), Derema (East Usambara) and Uzungwa-Iyondo (Udzungwa)	Remote sensing and aerial surveys	Every 5 years	Depending on funds. For 2008 CEPF and FBD have funds	Sokoine University GIS lab or Institute of Resource Assessment in Dar es Salaam	A technically demanding and potentially expensive task

Goal for Sub Montane Forest: By 2017, 80% of remaining sub-montane forest is effectively conserved					
<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Forest cover between 800m and 1,500m	Remote sensing and altitudinal analysis	Every 5 years	Depending on funds. For 2008 CEPF and FBD have	Sokoine University GIS lab or Institute of Resource	A technically demanding and

altitude			funds	Assessment in Dar es Salaam	potentially expensive task
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Goal for Montane Grasslands: By 2017, representative samples of the montane grassland in the Eastern Arc mountains are effectively conserved					
WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Area of grassland above 2,000m altitude within reserves	Remote sensing and GIS	Every 5 years	Depending on funds. For 2008 CEPF and FBD have funds	Sokoine University GIS lab or Institute of Resource Assessment in Dar es Salaam	A technically demanding and potentially expensive task

Goal for Montane Wetlands: By 2017, representative samples of montane wetlands in the Eastern Arc mountains are effectively conserved					
WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Area of wetlands above 2,000 m altitude within reserves	Remote sensing and GIS	Every 5 years	Depending on funds. For 2008 CEPF and FBD have funds	Sokoine University GIS lab or Institute of Resource Assessment in Dar es Salaam	A technically demanding and potentially expensive task

Goal for Water Resources: By 2017, the streams, rivers and wetlands of the Eastern Arc Mountains have stable hydrology (within the natural range) and water quality is within acceptable standards.					
WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Rivers flows	Gauging stations within the Eastern Arc Mountains	Daily readings	River Basin Authorities and the Ministry of Livestock and Water	Rivers flowing from the Eastern Arc Mountains	Baselines have been identified in the report by Department of Hydrology – University of Dar es Salaam – show declines in many rivers. Many measuring stations are in need to refurbishment.

Water quality (sediments, nitrates, phosphates, pollutants)	Water sampling points within the Eastern Arc	Periodic readings	River Basin Authorities and the Ministry of Livestock and Water	Rivers flowing from the Eastern Arc Mountains	Baselines have been identified in the report by Department of Hydrology – University of Dar es Salaam
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Goal for Endemic species: By 2017, all endemic species are effectively conserved					
WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Alliance for Zero Extinction species (highly threatened species found in only a single locality; www.zeroextinction.org) covers 16 vertebrate species, but this is increasing as more species are described from small areas)	Special studies depending on each species	Every 5 years	Researchers	At the locations where these species are found	Data on the status and distribution of these species is stored in the CEPF ‘outcomes’ Database and at the BirdLife partners in the region (WCST in Tanzania). Shared with FBD database.
Other endemic species (96 vertebrate animals and 800-1,000 plants)	Special studies depending on resources available	Every 5 years	Researchers	In each of the forests of the Eastern Arc Mountains	Data gathered and stored at the national Biodiversity database (University of Dar es Salaam) and in CEPF outcomes database. Shared with FBD database
Goal for Wide-ranging threatened Species: By 2017, wide ranging threatened species populations are either increasing or that fluctuating within normal variation within the Eastern Arc region					
WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments

Elephant	Population range assessment (sites) Population census in Udzungwa Mountains NP	When resources are available	Udzungwa NP ecologist. Other researchers as are available	Udzungwa, Rubeho, Mahenge blocks (not present elsewhere)	Elephant populations are increasing the Udzungwa NP. Trends elsewhere are not known
Lion	Population range assessment.	When resources are available	Udzungwa NP ecologist.	Udzungwa, Malundwe, Mahenge blocks (not present elsewhere)	Lion populations are unknown, but the species is present especially in Udzungwa

Goal for species under trade: By 2017, the trade in Eastern Arc species is effectively controlled					
<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Chameleon exports	Trade (export) data against quotas	Annually	Wildlife Department/CITES/TR AFFIC	Dar es Salaam	It is not known how accurate the export data are
Amphibian exports	Trade (export) data against quotas	Annually	Wildlife Department/CITES/TR AFFIC	Dar es Salaam	It is not known how accurate the export data are
Bird exports	Trade (export) data against quotas	Annually	Wildlife Department/CITES/TR AFFIC	Dar es Salaam	It is not known how accurate the export data are

IV. Prioritization of Threats and Selection of Strategies

In this section we take the results of the conceptual model (see above), where threats have been identified for the agreed conservation targets, and use a standard methodology to prioritise the threats. The priority threats define the main implementation strategies for the ‘Eastern Arc Mountains Conservation Strategy and Action Plan’.

The threats identified in the conceptual model are (in alphabetical order):

Conversion of natural habitats to agriculture
Illegal grazing
Illegal logging
Inappropriate mining practices
Invasive species
Uncontrolled fire
Unsustainable collection of medicinal plants
Unsustainable collection for the pet trade
Unsustainable collection of firewood and building materials
Unsustainable hunting/poaching

4.1 Threat Prioritization

In order to prioritise the threats to the Eastern Arc Mountains we undertook the following activities:

- 1) Selected every direct threat that impacted on an agreed conservation target in the Eastern Arc Mountains (from the conceptual model and listed *above*).
- 2) Scored a relative threat value for each threat in turn against standard criteria (see *below*). The highest score that any threat could get for each criterion was equal to the total number of the threats in the matrix.
- 3) Added up the threat scores and assigned them to one of three categories: “very high” priority, “high” priority, “medium” priority or “low” priority (see table below).

The threat criteria used in step (2) of the prioritization process were as follows:

- **Extent.** How big an area does the threat affect? Does it affect all of the Eastern Arc or just a small part of it?
- **Intensity.** How strong is the impact of the threat on a given piece of habitat, ecosystem service or wildlife population? Will it destroy it completely? Or will it cause only minor damage?
- **Urgency.** How urgent is it to deal with the threat? Is the threat severe and occurring now? Or is it only likely to be important in future years?

This process was undertaken at the October 2006 planning meeting. Consideration was also made of the various threat prioritizations that had been by other studies. The ranked threats for the Eastern Arc Mountains identified from this exercise were :

Threat	Extent	Severity	Urgency	Total
Uncontrolled fire	10	9	10	29
Conversion of natural habitats to agriculture	9	10	9	28
Illegal logging	7	7	6	20
Unsustainable collection of firewood and building materials	8	6	7	21
Inappropriate mining practices	1	8	8	17
Illegal grazing	4	4	5	13
Unsustainable hunting/poaching	6	5	4	15
Unsustainable collection for the pet trade	3	1	3	7
Unsustainable collection of medicinal plants	5	3	2	10
Invasive species	2	2	1	5

Key to the overall ranking of threat

Very High	
High	
Medium	
Low	

The October 2006 strategy meeting considered that insufficient information was available to evaluate and prioritise the potential impact of climate change in the Eastern Arc Mountains. Thus, it was not included in the threat ranking, although it is known that this threat has the potential to have an overriding effect on the habitats and species of the Eastern Arc.

4.2 Strategy Selection Process

The selection of those implementation strategies to be included within the overall 'Eastern Arc Mountains Strategy and Action Plan' was undertaken using a standardized methodology that has been applied in other similar planning exercises globally. The approach is as follows:

- 1) Select a priority threat.
- 2) Using the conceptual model (*above*), identify all the main factors that contribute to that threat (e.g. market factors, social organization, people's general level of knowledge of appropriate practices, politics, law enforcement, etc) and extract them from the model .
- 3) If there are only a few factors in the conceptual model that contribute to this threat, or if the conceptual model fails to capture the most important factors, then identify more factors.
- 4) Of these main factors, eliminate those that cannot be changed and highlight those that have to be changed to reduce the threat – these are the **key factors**.
- 5) Brainstorm in a small group the potential strategies to influence these key factors.
- 6) Select the final strategies, based on the following criteria:
 - The strategy is essential to reduce the threat.
 - The strategy is not already being fully addressed by others.
 - The skills and experience exist to undertake the strategy.

The implementation strategies that have been identified to address the priority threats are as follows:

Main threat	Strategies identified	Type of strategy
Uncontrolled Fire	Raise awareness of fire control	Implementation
Agriculture expansion and illegal grazing	Gazette upper catchment areas	Implementation
	Multisectoral collaboration	Implementation
	Land use planning at the village level	Implementation
Illegal logging	Promoting the effectiveness of Participatory Forest Management	Implementation
	Promoting alternative economic activities	Implementation
Unsustainable collection of Firewood and Building Materials	Expand village land, community based, and private forest reserves	Implementation
Illegal Mining	Strengthen management capacity and raise awareness	Implementation
Illegal hunting and poaching	Promote hunting control with Joint Management Agreements	Implementation
Invasive Alien species	Reduce expansion of invasive species	Implementation
Unsustainable collection for pet trade	Situation Analysis and Education and Awareness	Implementation
Other issue		
Reducing water quality and quantity	Water flow and quality	Cross cutting
Insufficient awareness	Information, education and awareness	Cross cutting
Insufficient finance	Sustainable finance	Cross cutting
Adverse climate change	Climate change mitigation	Cross cutting

Subsequent chapters of this document focus on describing each of the main strategies. The material presented was developed at the October 2006 planning meeting and updated at the June 2007 planning meeting.

Each chapter begins with a mini conceptual model that was produced to help identify the root causes of that threat. The chapter then proceeds to outline the ‘results chain’ for the strategy that was regarded by the group as the best way to tackle that threat. A number of major objectives are then identified and a list of activities that are required to be implemented are proposed. Finally a monitoring matrix is presented on how to measure impact.

V. Strategies to Address Fire

5.1 Analysis of the Root Causes of this Threat

Fire is used by local people to clear areas of bush ready for farming and to improve prospects for hunting. In the Eastern Arc fires are set to clear fields, but also spread into the area from the lowlands and then spread up the mountains. Occasionally these fires enter the forests – where they can cause significant damage to these habitats.

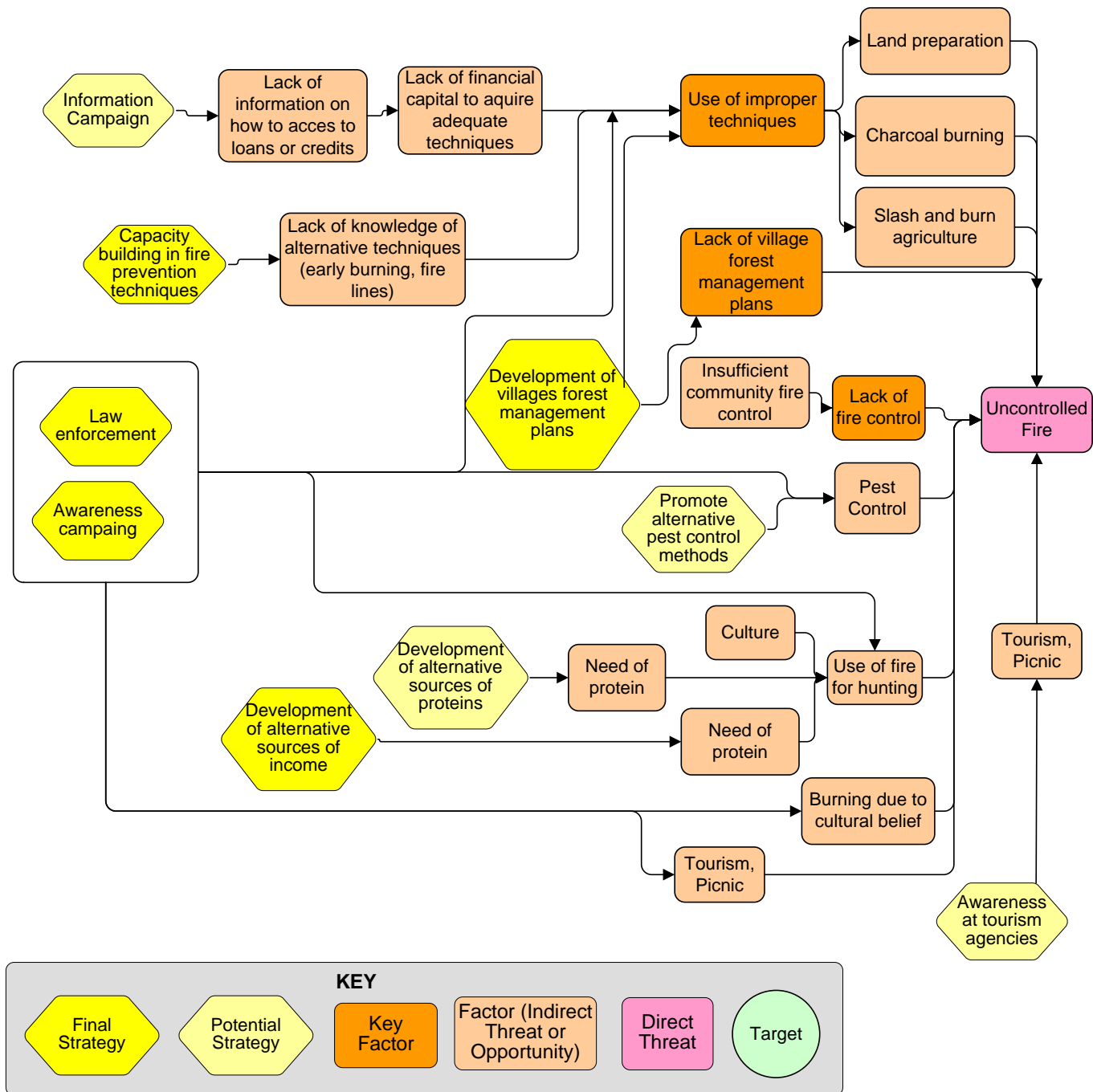
Uncontrolled fire is regarded as a major threat to the montane grasslands and the sub-montane forests, but is also a threat to montane and upper montane forests. A mini-conceptual model (see below) was developed to identify the key factors that caused the high rates of fire. These were a) the lack of village forest management plans, b) the use of improper fire techniques, and c) the general lack of fire control. Consideration of the factors and the various strategies proposed to identify them resulted in the selection of five ‘final strategies’, as follows:

- 1) Development of village forest management plans
- 2) Capacity building in fire prevention techniques
- 3) Promotion of traditional working parties
- 4) Law enforcement
- 5) Awareness campaigns

Of these only the awareness campaign was further developed into an implementation strategy. Further detail on the ways to tackle fires can be found in the CMEAMF thematic strategy on ‘fire reduction’ that can be found on www.easternarc.or.tz. CMEAMF has also developed an Information, Education and Communication strategy which outlines important messages for various stakeholders on the Eastern Arc Mountains. This thematic strategy can be downloaded from www.easternarc.or.tz.

A pictorial representation of the mini conceptual model relating to the issue of uncontrolled fire is outlined below :

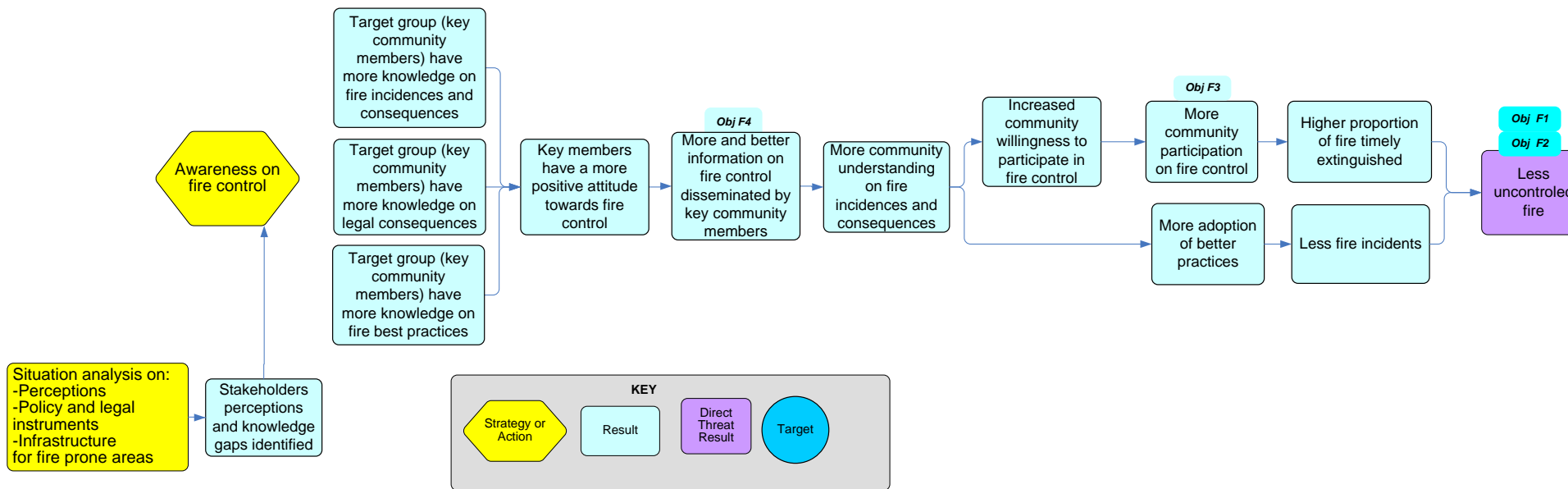
Mini-conceptual model for uncontrolled fire in the Eastern Arc Mountains



5.2 Strategy to Raise Awareness of Fire Control

Results Chain

This results chain outlines how raising awareness of the issue of fire as a threat to the Eastern Arc Mountains ecosystem can be translated into a reduction in uncontrolled fire. In turn this is expected to result in a lower level of damage to the montane grasslands and sub-montane forests (in particular). The chain should be read left to right.



Objectives, Activities, and Monitoring

Objective F1: By 2017, the number of fires across the Eastern Arc are reduced from the 1,643 fire points per annum in 2003 to less than 1,000 fire points*.

Objective F2: By 2017, total area burnt in fire prone areas** of the Eastern Arc is reduced by about 30%.

Objective F3: By 2012, fire control plans are developed and implemented in 80% of the ca.300 villages in fire prone areas of the Eastern Arc**

Objective F4: By 2010, fire control committee members are actively involved in fire protection activities in the most fire prone areas of the Eastern Arc**.

* Fire points are measured by the MODIS satellite and daily data are available from the internet.

** The most fire prone areas are Chome in South Pare, Uluguru, Mahenge and Udzungwa Mountain ranges.

Activities

- Compile MODIS fire points data from the University of Maryland to assess if the number of fire points in Tanzania has declined since 2003 (monitoring on annual basis).
- Compile MODIS fire points data from the University of Maryland to assess if the area of fires in Tanzania has declined since 2003 (monitoring on annual basis).
- Prepare and operationalize a programme to develop control committees and activities in the key villages in fire prone areas of the Eastern Arc.
- Produce and disseminate fire control and prevention information materials.
- Disseminate messages at national, district and village levels on fire prevention using appropriate media.
- Establish fire prevention committees in the villages across the Eastern Arc.
- Disseminate policies, laws, regulations and by-laws to districts and communities across the Eastern Arc.

Monitoring Plan for Fire

The below outlines what would need to be done to measure the achievement of the targets identified in the plan.

By 2017, the number of fire points across the Eastern Arc are reduced from the 1,643 fire points per annum in 2003 to less than 1,000					
<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>

Number of fire points	MODIS fire points data from the University of Maryland	Every year	FBD, IRA, SUA, UCLAS, Regional Center for Mapping and Remote Sensing (RCSSMRS)	FBD, IRA, SUA, UCLAS, RCSSMRS	Further detail on the ways to tackle fires can be found in the CMEAMF thematic strategy on 'fire reduction' that can be found on www.easternarc.or.tz
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By 2017, total area burnt in fire prone areas* of the Eastern Arc is reduced by about 30%.

WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Total Area Burnt	MODIS fire points data from the University of Maryland Field Surveys	Every year	FBD, IRA, SUA, UCLAS, Regional Center for Mapping and Remote Sensing (RCSSMRS)	FBD, IRA, SUA, UCLAS, RCSSMRS	FBD has Primary Responsibility. Others are Partners

By 2012, fire control plans are developed and implemented in 80% of the ca.300 villages in fire prone areas of the Eastern Arc

WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Number of Developed Fire Control Plans Number of Implemented Fire Control Plans	Field Reports Field Surveys	Every year	FBD, District Councils, Village Governments, Village Natural Resources Committee	FBD, Districts, Villages	-

By 2010, Natural Resources Committees are actively involved in fire protection activities in the most fire prone areas of the Eastern Arc*

WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Number of Active Village Natural Resources Committees	Field Visits and Surveys Reports	Every year	FBD, District Governments	FBD, Districts Villages	-

VI. Strategies to Address Agriculture and Illegal Grazing

6.1 Analysis of the Root Causes of these Threats

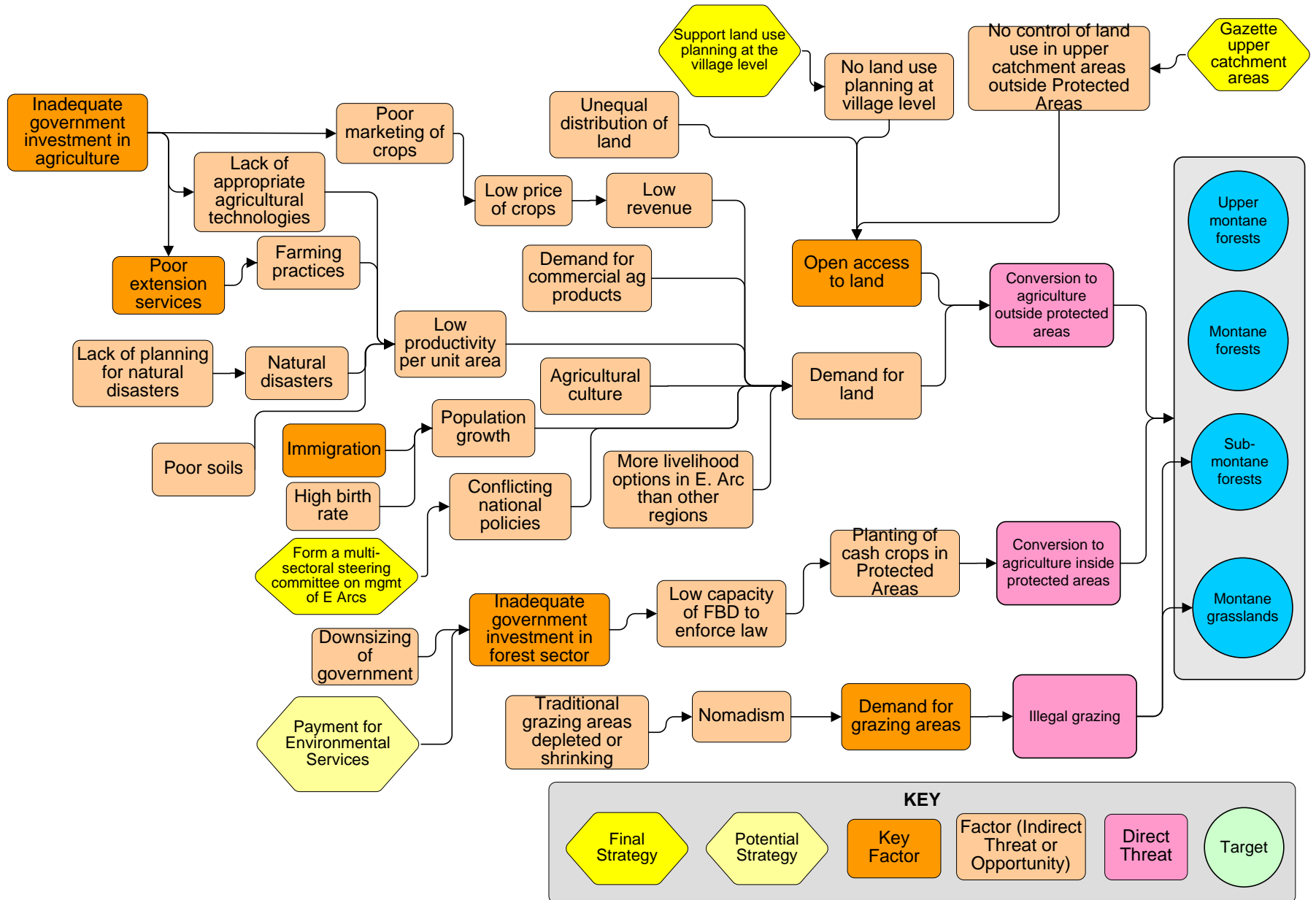
Agricultural encroachment is one of the major threats to the forests and natural grasslands in the Eastern Arc Mountains. A less important, but linked, threat is illegal grazing of cattle (and sometimes sheep and goats and even pigs) within the reserves in the Eastern Arc Mountains. The key factors that were identified within the mini-conceptual model (see *below*) as driving agricultural encroachment were a) inadequate government investment in agriculture, b) poor extension services, c) open access to land, d) immigration and the search for new farmlands, e) inadequate government investment into the forest sector, f) demand for grazing areas. Consideration of the factors and the various strategies proposed to identify them resulted in the selection of three ‘final strategies’, as follows:

- 1) Gazette upper catchment areas as reserves
- 2) Support land use planning at the village level
- 3) Form a multi-sectoral steering committee for the management of the Eastern Arc Mountains

All of these strategies have been developed through the application of the results chain planning process, identification of objectives and activities, and the elaboration of a suitable monitoring plan. Payments for Ecological Services was identified as a potential strategy, and this is addressed later in the document under the section on cross cutting issues.

A pictorial representation of the mini conceptual model relating to the issue of agricultural and illegal grazing is outlined overleaf. Further detail on the issue of gazetting reserves in the Eastern Arc Mountains can be found in the thematic strategy on ‘protected areas’ that can be downloaded from www.easternarc.or.tz.

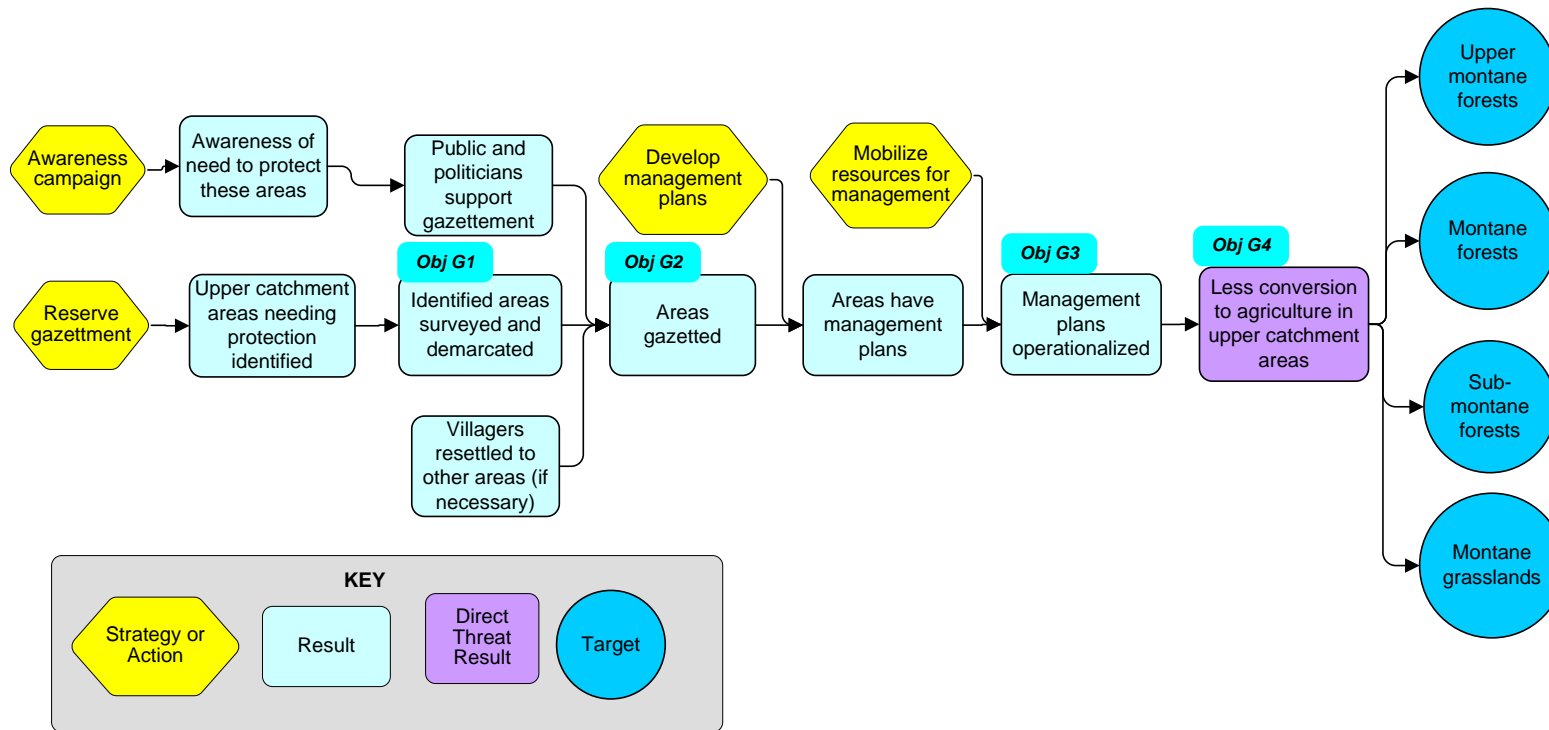
Mini-conceptual model for agriculture and livestock in the Eastern Arc Mountains



6.2 Strategy to Gazette Important Upper Catchment Areas

Results Chain

This results chain outlines how sub-strategies such as the process of gazettement, an awareness campaign, developing management plans, and mobilizing resources for management of the reserves combine to ensure less conversion to agriculture in the upper catchment areas. It is expected that these provide better protection to the Eastern Arc forests and grasslands, together with the species they support. The chain should be read left to right.



Objectives, Activities and Monitoring

Objective G1. By 2017, all unprotected forest patches are identified and gazettement processes are underway, including the forest corridors of Derema and Nilo- Kambai (East Usambara), Bunduki (Uluguru) and Iyondo-Uzungwa Scarp (Udzungwa).

Objective G2. By 2012, ten proposed Forest Reserves covering over 60,000 ha are gazetted as national Forest Reserves, at least three Nature Forest Reserves (Nilo, Uluguru, West Kilombero) are established from within the current network of protected forest reserves, and the area of village forests is increased from 1,270 ha to at least 3,480ha.

Objective G3. By 2016, a standardized format for management plans agreed for catchment reserves and at least 30 plans have been completed and are under implementation.

Objective G4. By 2017, the rate of loss of forest in the Eastern Arc due to agriculture and grazing declines from 1,900 ha per decade (1990 – 2000) to less than 1,000 ha per decade, with forest area increasing in some blocks.

Activities

- Identify all unprotected forest patches (*see protected areas thematic strategy document*)
- Gazette the 10 proposed reserves across the Eastern Arc Mountains
- Gazette at least 6 new village forest reserves across the Eastern Arc Mountains
- Create functional forest corridors in East Usambara, Uluguru and Udzungwa Mountains
- Develop and agree standardized format for simple and operational management plans
- Write and implement at least 30 simple management plans for Eastern Arc forests
- Remove villages and illegal farmers from within boundaries of Eastern Arc Forest Reserves

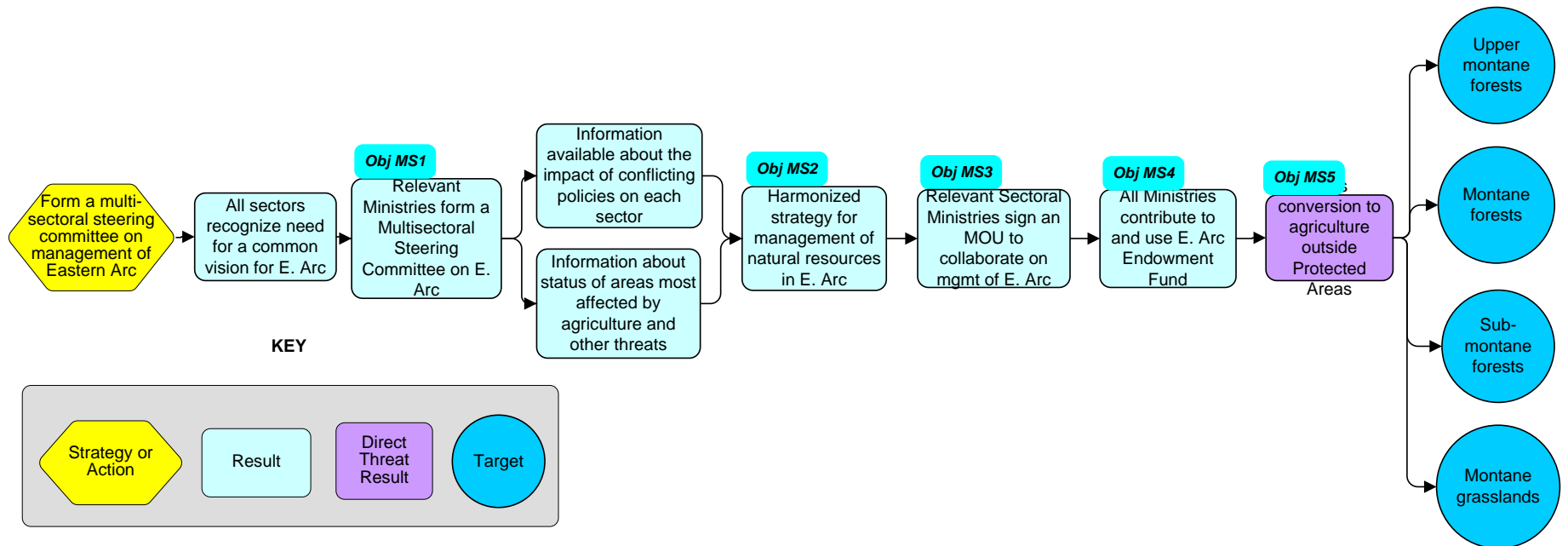
WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Objective G1. By 2017, all unprotected forest patches are identified and gazettement processes are completed, including the forest corridors of Derema and Nilo- Kambai (East Usambara), Bunduki (Uluguru) and Iyondo-Uzungwa Scarp (Udzungwa).					
Gazettement notices for Bunduki gap, Derema, Iyondo-Uzungwa Scarp	FBD gazettement process through village, Ward, District supported by development partners	Ongoing	FBD, Districts, Development partners	Morogoro, Mvomero, Muheza, Kilombero Districts	The gazettement by FBD of Bunduki and Derema has started with UNDP-GEF and CEPF support but needs to be concluded. For Iyondo-Uzungwa Scarp further support is required for the gazettement process, although the corridor development has been planned with CEPF funding. Details of all other sites are found in the protected area strategy developed by CMEAMF (www.easternarc.or.tz)
Objective G2. By 2012, ten proposed Forest Reserves covering over 60,000 ha are gazetted as national Forest Reserves, at least three Nature Forest Reserves (Nilo, Uluguru, West Kilombero) totaling over 150,000 ha are established from within the current network of protected forest reserves, and the area of village forests is increased from 1,270 ha to at least 3,480ha.					
Gazettement notices for the three Nature Reserves, ten proposed Forest Reserves and at least 5 new Village Forest Reserves	FBD gazettement process through village, Ward, District supported by development partners	Ongoing	FBD, Districts, Development partners	Most of the 14 Districts in the Eastern Arc Mountains Region	The gazettement of the Nilo, Uluguru and Kilombero Nature Reserves by FBD is ongoing with UNDP-GEF support. Support to gazettement 7 new Forest Reserves is being provided by UNDP-GEF, but some other forest areas remain unprotected. Gazettement Village Forest Reserves is being supported by the catchment forest programme, the PFM component of the Tanzania Forest Conservation and Management Project, and NGOs.
Objective G3. By 2016, a standardized format for management plans agreed for catchment reserves and at least 30 plans have been completed and are under implementation.					

WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Management Plan Guidelines Published. Management Plans completed and ratified.	FBD writes, agrees and prints management plan guidelines. FBD facilitates development of management plans	Ongoing	FBD, Districts and Development partners	At FBD headquarters in Dar es Salaam. And in the various FBD Regional centers and at the Districts across the Eastern Arc.	Management plan guidelines for protection forests are ratified and in the process of being printed. A number of management plans also exist in draft, but few have been ratified at FBD headquarters.
Objective G4. By 2017, the rate of loss of forest in the Eastern Arc due to agriculture and grazing declines from 1,900 ha per decade (1990 – 2000) to less than 1,000 ha per decade, with forest area increasing in some blocks.					
Forest cover between 500m and 2,500m altitude	Remote sensing and altitudinal analysis	Every 5 years	Depending on funds. For 2008 CEPF and FBD have funds	Sokoine University GIS lab or Institute of Resource Assessment in Dar es Salaam	A technically demanding and potentially expensive task

6.3 Strategy for Multisectoral Collaboration on the Management of the Eastern Arc Mountains

Results Chain

This results chain outlines how the establishment of a multisectoral committee for management of the Eastern Arc Mountains would lead to a reduction of conversion of natural habitats to agriculture. It is expected that this would help conserve the Eastern Arc forests and grasslands, with their associated species and water provisioning services.



Objectives, Activities and Monitoring

Objective MSI. By 2008, a multisectoral steering committee on the management of Eastern Arc Mountains is formed, meeting at least three times per year, and has developed and is implementing a workplan.

Objective MS2. By 2010, a fully harmonized second version strategy document is in place for the environment and management of natural resources (forests, agricultural land and water) in the Eastern Arc Mountains.

Objective MS3. By 2011, an MOU on collective conservation of Eastern Arc Mountains is signed by the relevant Ministries.

Objective MS4. By 2012, all Ministries in the MOU contribute to and access funds from the Eastern Arc Mountains Conservation Endowment Fund.

Activities

- Develop Terms of Reference for the multisectoral committee
- Seek inputs from the various Ministries to the Eastern Arc Mountain strategy
- Produce an updated version of the strategy
- Develop an MOU for management of Eastern Arc between sectoral ministries
- Agree on financial inputs into the Eastern Arc Mountains Conservation Endowment Fund

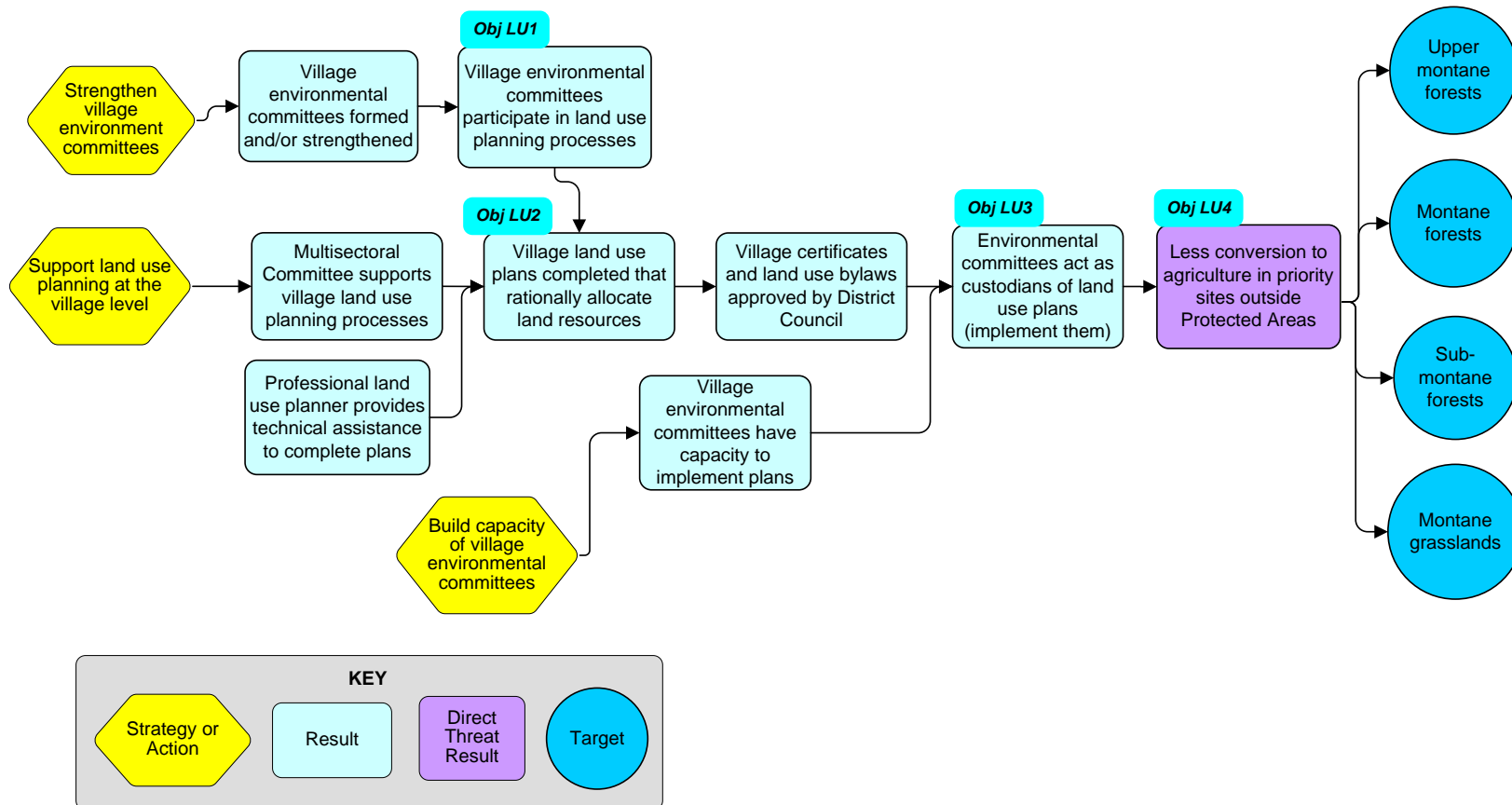
<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective MSI. By 2008, a multisectoral steering committee on the management of Eastern Arc Mountains is formed, meeting at least three times per year, and has developed and is implementing a workplan.					
Steering Committee established and meeting regularly	Define terms of reference and membership and constitute committee. Locate funds to pay for meetings.	At least twice per annum. Starting 2009 when CMEAMF phases out.	FBD. Other government representatives. Development partners.	Dar es Salaam, or regional centres such as Morogoro at the Eastern Arc Centre.	This committee would take over the work of the CMEAMF Project Advisory Committee when that ends at the close of the project at end 2008.
<i>WHAT</i>	<i>HOW (Methods &</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>

<i>(Indicators)</i>	<i>Tasks</i>				
Objective MS2. By 2015, a fully harmonized second version strategy document is in place for the environment and management of natural resources (forests, agricultural land and water) in the Eastern Arc Mountains.					
Updated Eastern Arc strategy document	Further series of meetings completed to update strategy document	After 5 years implementation of this strategy (2008-2012)	FBD. Other Ministries. Development partners.	Tanzania.	This process would need additional funding.
Objective MS3. By 2011, an MOU on collective conservation of Eastern Arc Mountains is signed by the relevant Ministries.					
Signed MOU	Drafting of the MOU and meetings to agree text and sign.	Follow up activity after the completion and endorsement of this strategy document	Ministry of Natural Resources and Tourism. Other relevant Ministries.	Tanzania.	This process can only start when this current strategy is completed and endorsed.
WHAT (Indicators)	HOW (Methods & Tasks)	WHEN	WHO	WHERE	Comments
Objective MS4. By 2012, all Ministries in the MOU contribute to and access funds from the Eastern Arc Mountains Conservation Endowment Fund.					
Funding contributed to EAMCEF by various Ministries. Proposals submitted to EAMCEF	Negotiation between Ministries to provide conservation funds to EAMCEF.	Ongoing	FBD. Other Ministries.	Tanzania	This process needs to be started.

6.4 Strategy to Support Land Use Planning at the Village Level

Results Chain

This results chain outlines how the sub-strategies of strengthening village environment committees, supporting land use planning at the village level, and building the capacity of village environmental committees aim to achieve a reduction in the conversion of natural habitats to agriculture. It is expected that this would help conserve the Eastern Arc Mountain forests and grasslands, with their associated biodiversity and ecosystem service values.



Objectives, Activities and Monitoring

Objective LU1. By 2010, 100% of the village environment committees in the five targeted mountain blocks (Uluguru, Nguru, and East and West Usambara, Udzungwa) are actively participating in land use planning processes.

Objective LU2. By 2015, at least 70% of the villages in five targeted mountain blocks (Uluguru, Nguru, East and West Usambara, Udzungwa) have land use plans in place.

Objective LU3. By 2017, villagers adhere to the land use plans and bylaws in 70% of the villages in the five targeted mountain blocks (Uluguru, Nguru, East and West Usambara, Udzungwa).

Objective LU4. By 2017, the rate of forest loss to agriculture has been reduced from 1,900 ha per decade (1990-2000) to under 1,000 ha per decade (with forest increase in some areas), and the rate of loss of woodland has been reduced from 38,000 ha per decade (1990 – 2000) to under 10,000 ha per decade.

Activities

- Establish environment committees in villages where they do not exist
- Instigate programmes of land use planning where these are required
- Assist the ratification and implementation of these plans
- Undertake repeat of the land cover change analysis of 2005

Monitoring Plan for Land use planning

<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective LU1. By 2010, 100% of the village environment committees in the five targeted mountain blocks (Uluguru, Nguru, and East and West Usambara, Udzungwa) are actively participating in land use planning processes.					
Village environment committees in place	Village by village process to establish environment committees around the priority forests	Ongoing	Ministry of Lands. Districts. Development Partners.	Across more than 100 villages in the target 5 blocks	A long term process that will require considerable inputs over many years.

Objective LU2. By 2015, at least 70% of the villages in five targeted mountain blocks (Uluguru, Nguru, East and West Usambara, Udzungwa) have land use plans in place.					
Land use maps completed	Village by village land use planning processes	Ongoing	Ministry of Lands. Districts. Development Partners.	Across more than 100 villages in the target 5 blocks	A long term process that will require considerable inputs over many years.
Objective LU3. By 2017, villagers adhere to the land use plans and bylaws in 70% of the villages in the five targeted mountain blocks (Uluguru, Nguru, East and West Usambara, Udzungwa).					
Complication with land use plans and bylaws	Village by village monitoring reported to Districts	As and when funds available	Ministry of Lands. Districts. Development Partners.	Across more than 100 villages in the target 5 blocks	A long term process that will require considerable inputs over many years.
Objective LU4. By 2017, the rate of forest loss to agriculture has been reduced from 1,900 ha per decade (1990-2000) to under 1,000 ha per decade (with forest increase in some areas), and the rate of loss of woodland has been reduced from 38,000 ha per decade (1990 – 2000) to under 10,000 ha per decade.					
Forest cover between 500 and 2,500 m altitude	Remote sensing and altitudinal analysis	Every 5 years	Depending on funds. For 2008 CEPF and FBD have funds	Sokoine University GIS lab or Institute of Resource Assessment in Dar es Salaam	A technically demanding and potentially expensive task

VII. Strategies to Address Illegal Logging

7.1 Analysis of the Root Causes of this Threat

Logging of timber within the Eastern Arc Mountains ‘protection’ Forest Reserves, managed by the catchment forests programme of FBD has been banned since 1986. However, there is still a significant amount of illegal logging going on in some reserves areas, especially from the Chome FR in the South Pare Mountains, the South Nguru and Kanga FRs in the Nguru Mountains, and Kisinga-Lugaru in the Udzungwa Mountains. Elsewhere pitsawing is being undertaken in all reserves, but at a lower intensity than in those outlined above.

The local demand for quality timber for doors, window frames and furniture drives this exploitation, with the wood being taken from the forest in planked form and then sold to traders who supply the market in towns. There is believed to be significant corruption involved in this illegal trade in timber from the Eastern Arc, although only anecdotal evidence is available to substantiate these rumours.

The illegal logging group developed a mini-conceptual model for the issue of illegal logging, which is presented below. This model indicated that the major drivers of the logging in the Eastern Arc Mountains are: a) weak law enforcement; b) inadequate capacity (human resource and equipment); c) inadequate alternative building materials; d) lack of awareness of the negative impacts of logging.

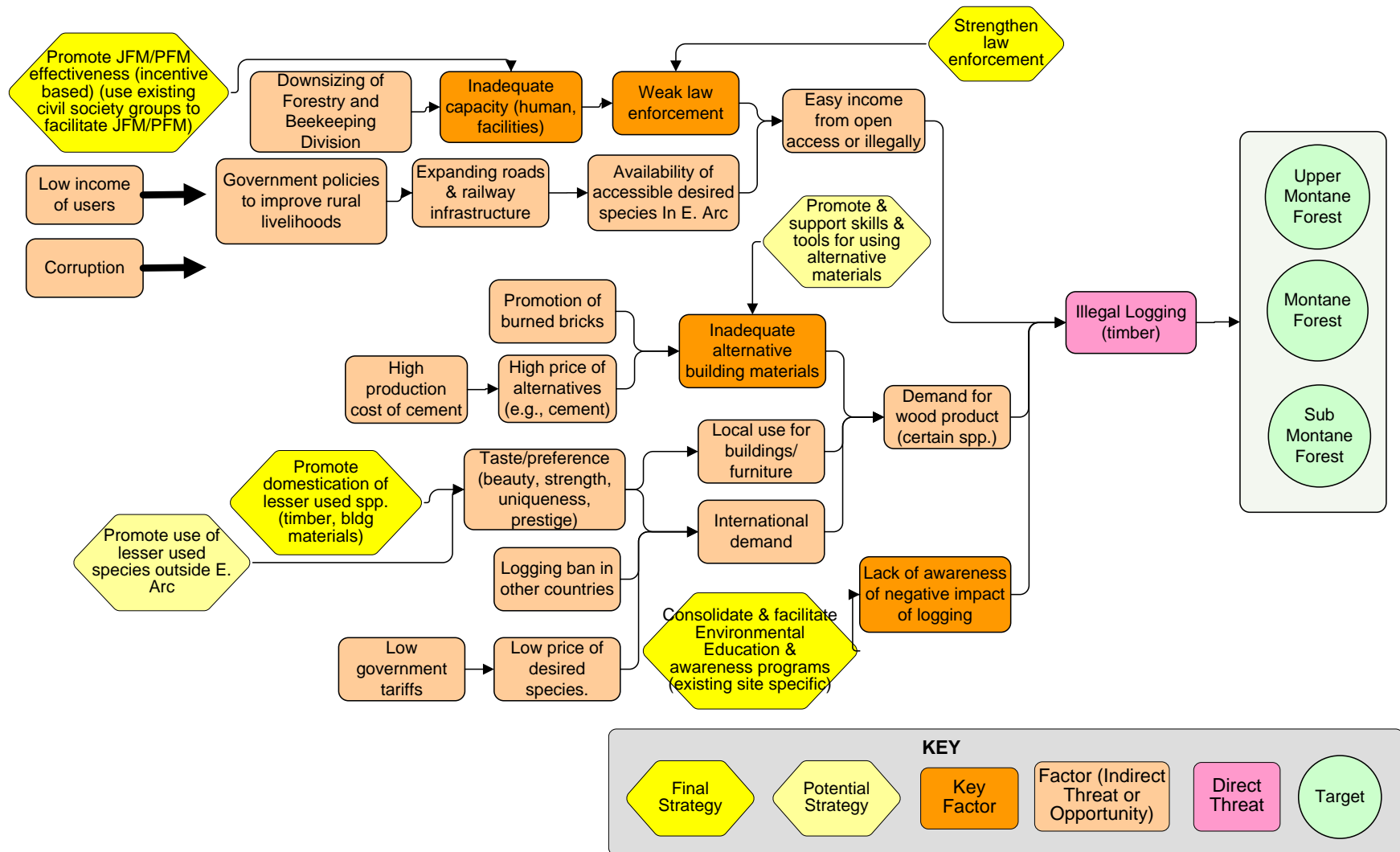
Lying behind these issues are matters of low household income (and thus the need to illegally log) and corruption within the system that is supposed to regulate or control this logging. These are important root causes of the problem that are hard to address without high level political support. The strategies that are proposed to address these drivers are as follows:

- Promote the effectiveness of JFM/PFM schemes by improving the incentives for those participating.
- Promote income generating activities that provide alternatives to illegal logging
- Strengthen law enforcement
- Consolidate and expand environmental education programmes

Of these, the first two have been developed fully using the results chain planning methodology. However, the work on strengthening law enforcement comes in other strategies, as does the need to develop and expand environmental education programmes.

A pictorial representation of the mini-conceptual model for addressing illegal logging is presented below, followed by results chains for the main strategies that are selected as priorities for intervention. Further detail on the issue of PFM in the Eastern Arc Mountains can be found in the thematic strategy on protected areas that can be downloaded from www.easternarc.or.tz.

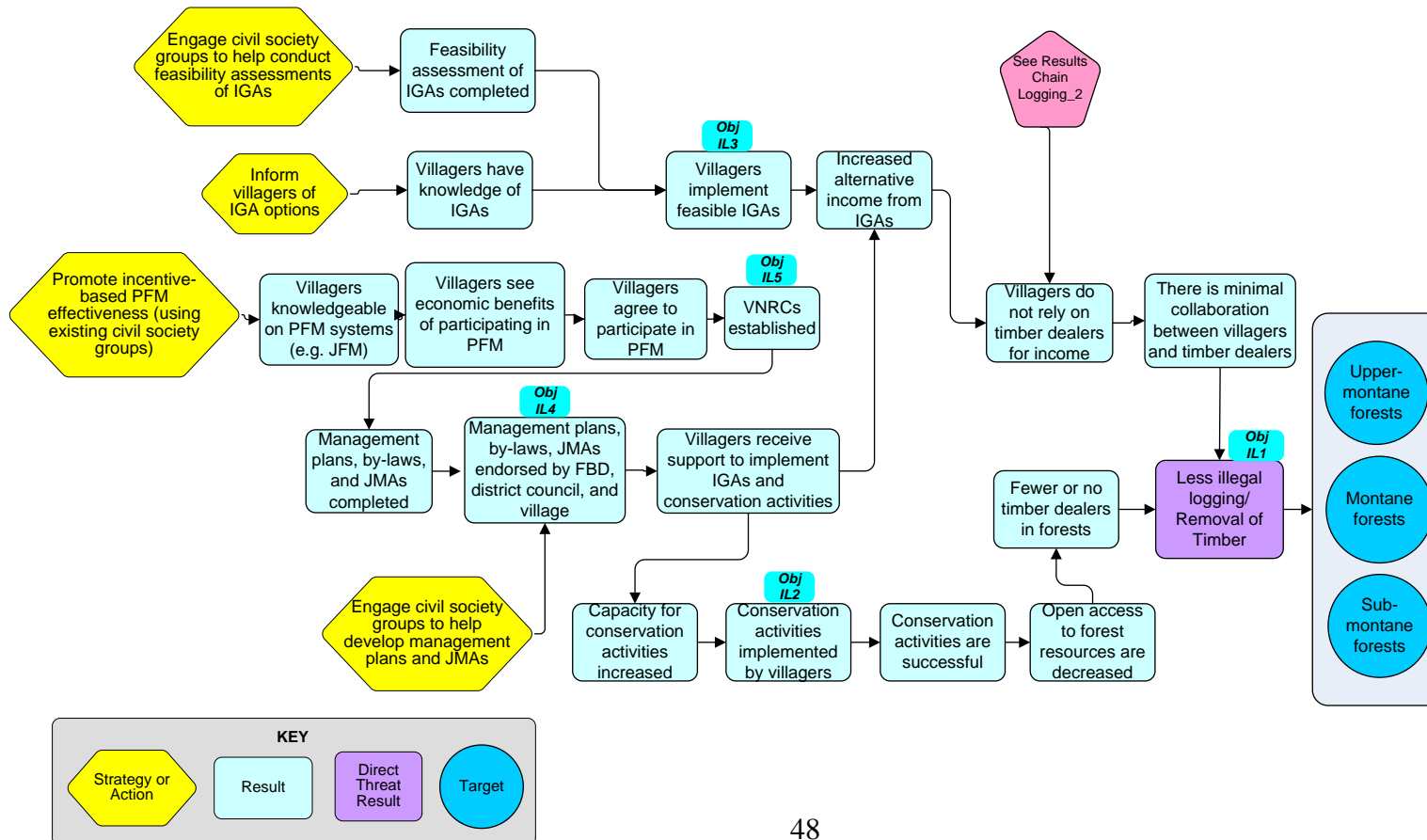
Mini-conceptual model for illegal timber logging



7.2 Strategy to Promote Effectiveness of Participatory Forest Management to Address Illegal Logging

Results Chain

This results chain presents four sub-strategies relating to improving participatory forest management in the Eastern Arc mountains so that it acts as a mechanism for reducing the levels of illegal timber logging. It is expected that this reduction will lower impacts on the remaining areas of Eastern Arc Mountain forest, and the species and ecological services that these areas provide.



Objectives, Activities and Monitoring

Objective IL1: By 2017 the rates of cutting declines from around 42 old cut and 2.5 new trees/hectare (baseline in 2004) to under 20 old cut and less than 1 new cut tree/ha within the forests under Joint Management Agreements (JMAs).

Objective IL2: By 2010, weekly patrolling by villagers is taking place in all villages with JMAs, and records are being submitted to the national forestry and beekeeping database (NAFOBEDA) through the districts or catchment forest officers.

Objective IL3: By 2017, each village with a signed JMA have implemented at least 3 IGAs, including utilization of the existing plantations of exotic species within selected Eastern Arc Forest Reserves (e.g. Kimboza, Bunduki, Shikurufumi in the Uluguru Mountains), and the establishment of suitable Savings and Credits (SACCOS) schemes.

Objective IL4: By 2017, the area of Eastern Arc Mountain Forest that is managed according to signed JMAs has increased from c. 200,000 to around 400,000 ha, and these agreements reflect the sharing of benefits and management responsibilities as outlined in the FBD Joint Forest Management guidelines (draft of 2006).

Objective IL5: By 2010, all forest-adjacent villages without existing Village Natural Resource Management Committees (VNRCs) have established them in the five focal Eastern Arc Mountains (Nguru, Uluguru, Udzungwa and W. and E. Usambara).

Activities

- Establish village natural resources committees in villages adjacent to the Eastern Arc Mountain Forest.
- Develop further JMAs in Eastern Arc Forests where benefits and responsibilities are clearly stated and agreed.
- Implement income generating programmes around Eastern Arc Mountain Forests
- Implement timber harvesting as a component of JMAs around smaller Eastern Arc Reserves containing mature or overmature exotic plantation species.
- Establish SACCOS schemes providing relevant credit to farmers and villagers.
- Repeat baseline study on forest disturbance to assess changes.

Monitoring Plan to address Illegal Logging

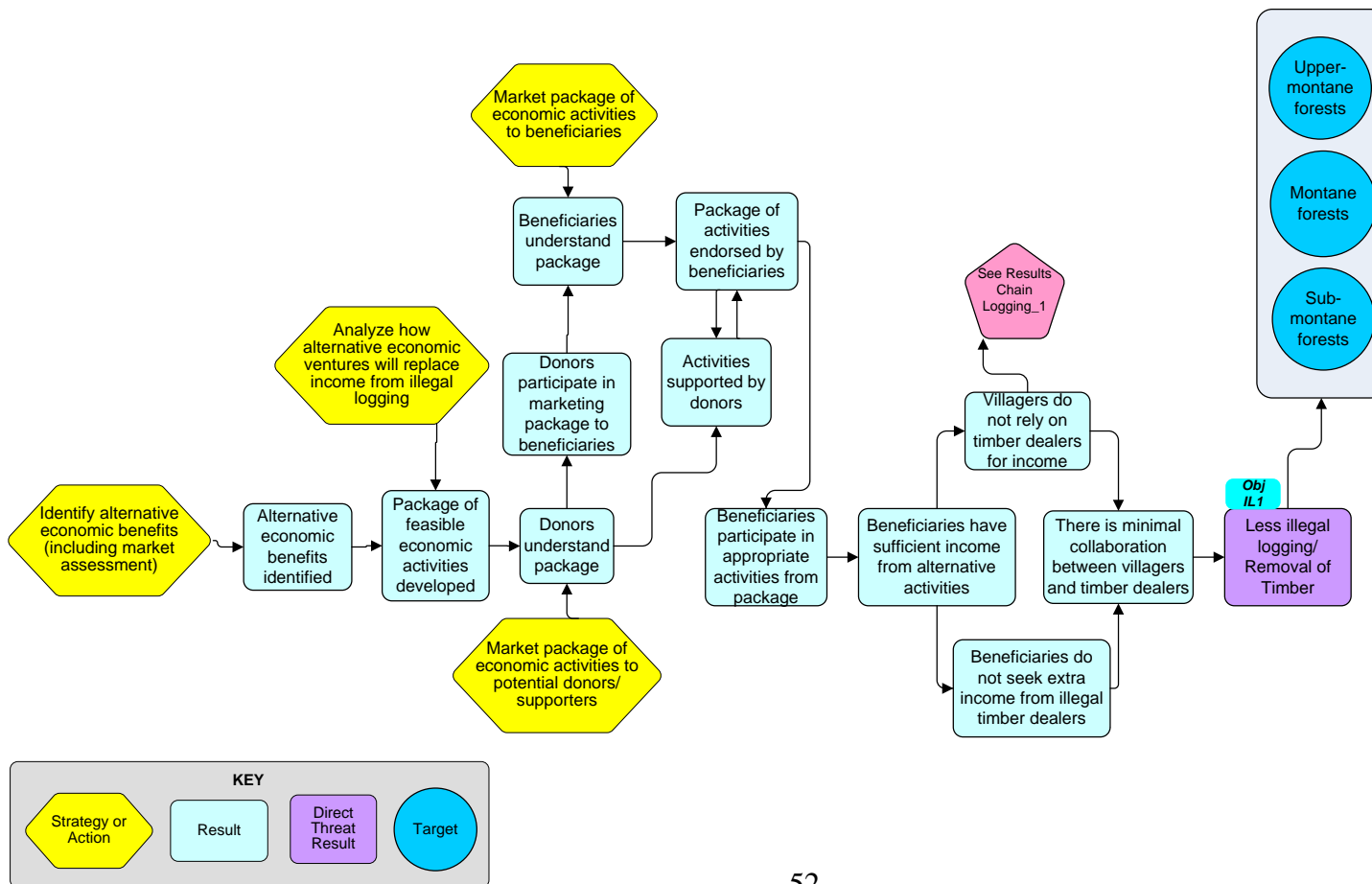
<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
<p>Objective IL1: By 2017 the rates of cutting declines from around 42 old cut and 2.5 new trees/hectare (baseline in 2004) to under 20 old cut and less than 1 new cut tree/ha within the forests under JMA agreements. .</p>					
<p>1. Decline of number of new cuts.</p> <p>2. Reports on decline in illegal logging.</p>	<p>1. Forest inventory/ assessment using PSP.</p> <p>2. Progress reports from surveillance unit, VNRC, DFO/DCFM</p>	<p>1. After every 5 years.</p> <p>2. Quarterly, annually</p>	<p>1. FBD</p> <p>2. surveillance unit, VNRC, DFO/DCFM</p>	<p>1. Eastern Arc Mountains</p> <p>2. Eastern Arc Mountains</p>	<p>1. Where capacity is inadequate out sourcing can be used.</p> <p>2. Train local data collectors (participatory resource assessment)</p>
<p>Objective IL2: By 2010, weekly patrolling by villagers is taking place in all villages with JMAs, and records are being submitted to the national forestry and beekeeping database through the districts or catchment forest officers.</p>					
<p>1. Total area and percentage of recorded forests managed by Village Council, Community Group and Joint Management Agreement</p> <p>2. Total number and percentage of JFM Forests for which patrol reports are prepared and submitted per quarter</p>	<p>1. weekly forest patrols and reporting</p> <p>2. Establishing and documenting forests under JMAs</p>	<p>1. Weekly</p> <p>2. Annually</p>	<p>1. Villagers and DFO/DCFMs</p> <p>2. Villagers and DFO/DCFMs</p>	<p>1. Eastern Arc Mountains</p> <p>2. Eastern Arc Mountains</p>	<p>1. Success will depend on incentive to participate</p>

Objective IL3: By 2017, each village with a signed JMA would have implemented at least 3 IGAs, including utilization of the existing plantations of exotic species within the following Eastern Arc Forest Reserves (Kimboza, Bunduki, Shikurufumi), and the establishment of suitable SACCOS schemes.					
1. Number of IGAs per village and across EAM	1. By scaling up successful IGAs and training on entrepreneurship	1. Annually	1. Villagers and DFO/ DCFMs	1. Villages adjacent to JMAs in the Eastern Arc Mountains	
2. Number and scope of SACCOS schemes in the Eastern Arc Mountains	2. By scaling up successful IGAs and training on entrepreneurship	2. Annually	2. Villagers and DFO/DCFMs	2. Villages adjacent to JMAs in the Eastern Arc Mountains	
Objective IL4: By 2017, the area of Eastern Arc Mountain Forest that is managed according to signed Joint Forest Management Agreements has increased from c. 200,000 to around 400,000 ha, and these agreements reflect the sharing of benefits and management responsibilities as outlined in the FBD Joint Forest Management guidelines (2006).					
Areas of Eastern Arc Mountains under JMAs increased	Awareness creation and meetings	Annually	FBD, DCFOs, DCFOs and villagers	2. Villages adjacent to JMAs in the Eastern Arc Mountains	
Objective IL5: By 2010, all forest-adjacent villages without existing VNRCs have established them in the four focal Eastern Arc Mountains (Nguru, Uluguru, Udzungwa and W. and E. Usambara)					
Number of functional VNRCs	Awareness creation and meetings and trainings	Annually	FBD, DCFOs, DCFOs and villagers	2. Villages adjacent to JMAs in the Eastern Arc Mountains	

7.3 Strategy to Promote Alternative Economic Activities to Reduce Illegal Logging/Removal of Timber

Results Chain

This results chain contains four sub-strategies that if implemented would provide sufficient incentives for people currently involved with illegal logging such that they reduced or ceased cutting timber illegally for their livelihoods. It is expected that this would result in beneficial changes to the condition of the Eastern Arc Mountain forests, and the species they support and ecological services they provide.



Objectives, Activities and Monitoring

Objective IL1: By 2017 the rates of cutting decline from 42 old cut and 2.5 new trees/hectare (baseline in 2004) and 48.5 old cut pole sand 3.5 new cut poles/ha (baseline in 2005) to under 20 old cut and less than 1 new cut pole/ha within the forests under JMA agreements.

Objective IL2: By 2010, a review of the existing IGAs and other opportunities indicates the best way to develop alternative economic activities that assist the conservation of the natural forests of the Eastern Arc Mountains.

Objective IL3: By 2017 a package of alternative economic activities is developed that is economically preferable to logging of timber trees within the natural forest, including the development of SACCOS schemes.

Objective IL4: By 2017 the package of preferred economic alternatives to logging is being heavily promoted by the government and donors.

Activities

- Review existing IGAs and assess which provide the greatest benefits (economic and ecological).
- Develop and promote package of the best IGAs in terms of supporting forest conservation.
- Promote package of most suitable IGAs to donors, investors and others across the Eastern Arc mountains.
- Repeat baseline study on forest disturbance to assess changes.

Monitoring Plan for alternative economic activities

<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective IL1: By 2017 the rates of cutting decline from 42 old cut and 2.5 new trees/hectare (baseline in 2004) and 48.5 old cut pole sand 3.5 new cut poles/ha (baseline in 2005) to under 20 old cut and less than 1 new cut pole/ha within the forests under JMA agreements.					
1. Decline of number of new cuts.	1. Forest inventory/ assessment using PSP. 2. Progress reports	1. After every 5 years.	1. FBD	1. Eastern Arc Mountains	1. Where capacity is inadequate out sourcing can be used.

2.Reports on decline in illegal logging.	from surveillance unit, VNRC, DFO/DCFM	2. Quarterly, annually	2. surveillance unit, VNRC, DFO/DCFM	2. Eastern Arc Mountains	2. Train local data collectors (participatory resource assessment)
Objective IL2: By 2010, a review of the existing IGAs and other opportunities indicates the best way to develop alternative economic activities that assist the conservation of the natural forests of the Eastern Arc Mountains.					
Document summarizing experience and lessons learned	Consultancy study	Once only when funds available	Consultants	Eastern Arc Mountains region	Funds would need to be found for this study, which would aim to inform the future development of additional IGA activities in the region
Objective IL3: By 2017 a package of alternative economic activities is developed that is economically preferable to logging of timber trees within the natural forest, including the development of SACCOS schemes.					
Number and value of Economic Activities	Projects through development partners and mainstreamed activities through central and local government	When funds are available	Government of Tanzania and development partners	Eastern Arc Mountains region	Establishing these economic activities will involve project partners, and the private sector.
Objective IL4: By 2017 the package of preferred economic alternatives to logging is being heavily promoted by the government and donors.					
Promotional materials for economic alternatives	Posters, leaflets, pamphlets	When funds to promote economic alternatives are available	Government of Tanzania and development partners	Eastern Arc Mountains region	Establishing these economic activities will involve project partners, and the private sector.

VIII. Strategies to Address Collection of Firewood and Building Materials

8.1 Analysis of the Root Causes of this Threat

One of the major threats to maintaining the quality of the forest is its extensive use as a source of woody materials for firewood and building purposes (poles) by forest-adjacent communities. In some places the collection of firewood is intensive and results in the removal (or near removal) of larger woody trees, leaving a tangle of scramblers and smaller shrubs. Such high impacts are concentrated close to regions of high human population density, and on the margins of the reserves.

Although illegal, the collection of firewood and building poles is tolerated by almost all foresters as it provides a tangible benefit from the forests. In the Udzungwa Mountains National Park, the extraction of dead wood for fire wood is permitted on an agreed basis with surrounding communities. The collection of poles for building homes is also an issue that is hard to regulate as people need to construct their homes using straight and resilient poles and these are not available in the farmlands.

The October 2006 workshop developed a mini-conceptual model that identified the following key factors in the cutting of woody materials for fuel wood and building poles: a) open access/availability; b) inadequate land for tree plantations; c) lack of feasible alternative firewood and building materials; d) demand for wood products from forest; e) inadequate extension services that promote the plantation/retention of suitable species; f) no appropriate species available on farmland; g) lack of awareness of sustainable methods, consumption patterns, etc.

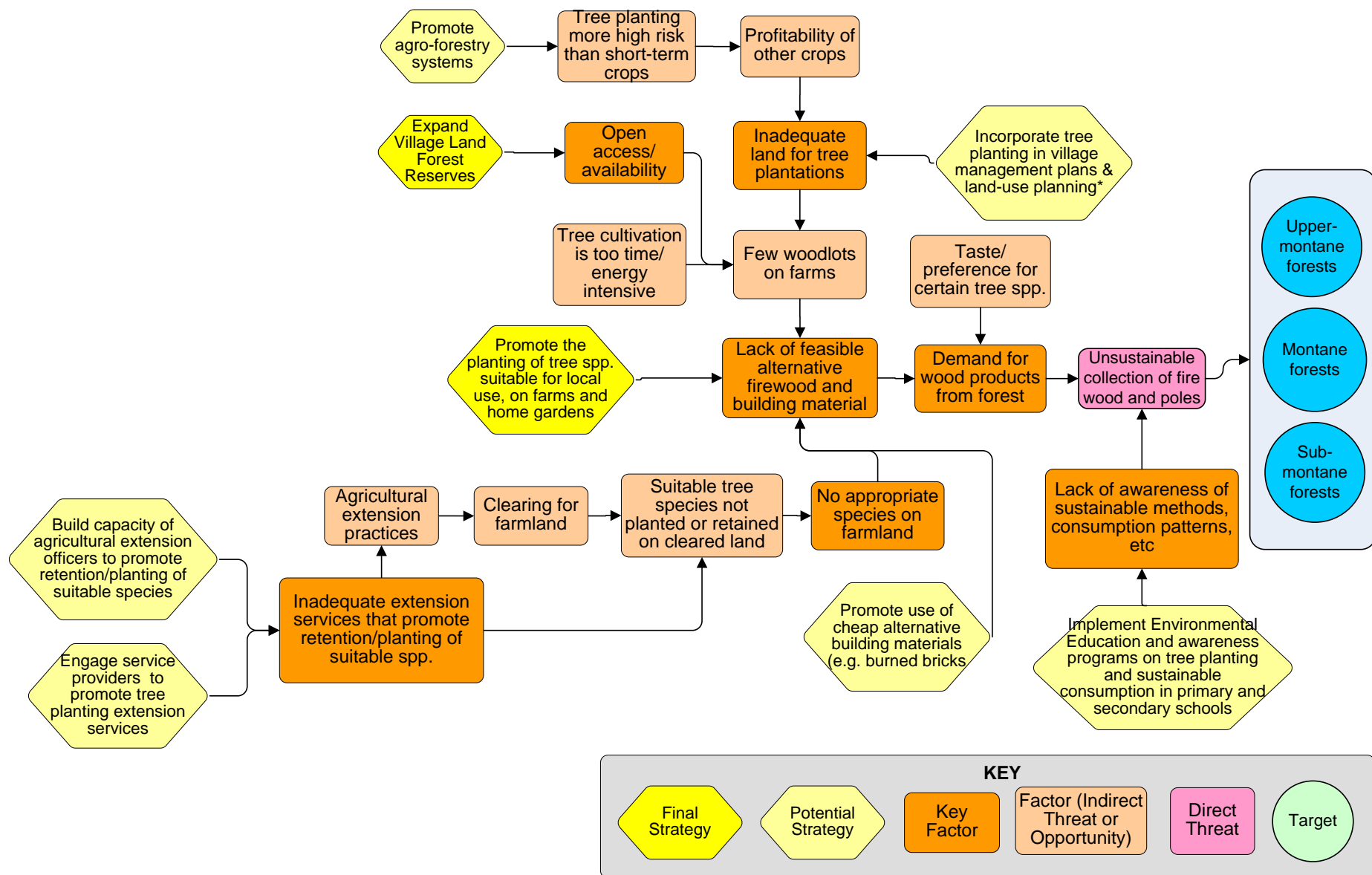
These key factors were then used to identify the most important strategies to be implemented across the Eastern Arc, as follows:

- Expand village land forest reserves
- Promote the planting of tree species suitable for local use, on farms and in home gardens

The first of these has been selected for development through the results chain method into a full strategy for inclusion in this plan.

A pictorial representation of the mini-conceptual model for addressing the collection of firewood and building material is presented below, followed by results chains for the main strategies that are selected as priorities for intervention. Further detail on the issue of PFM in the Eastern Arc Mountains can be found in the thematic strategy on protected areas that can be downloaded from www.easternarc.or.tz.

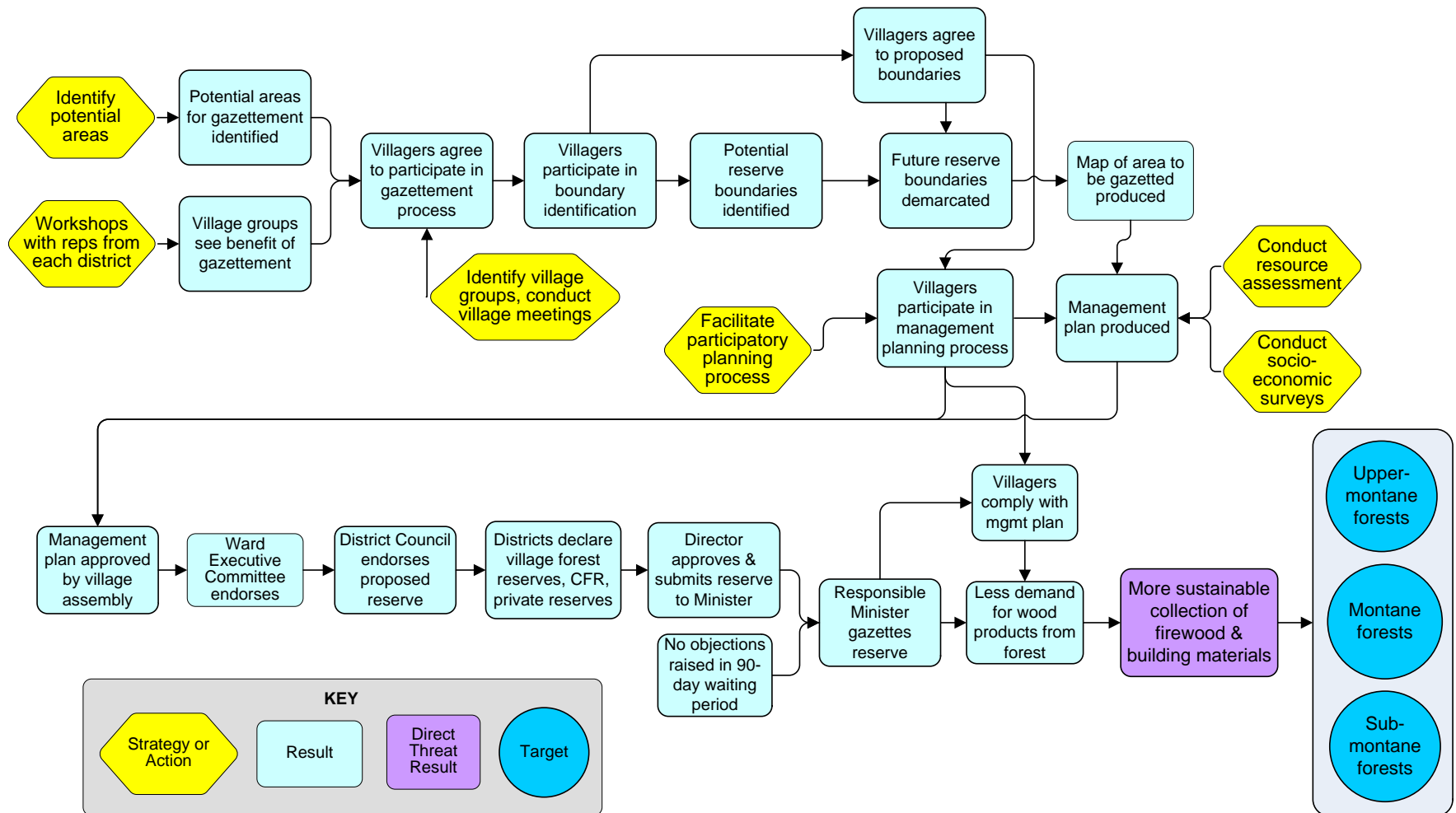
Mini-conceptual model for the collection of firewood and building materials



8.2 Strategy to Expand Village Land, Community Based and Private Forest Reserves

Results Chain

This results chain outlines the process of selecting new areas for village and private forest reserves and then working with communities and others to gazette and then development management plans for these areas. The aim is that by providing more of these areas managed by communities and private enterprise, then a supply of firewood and building materials can be found on the land outside the larger protected forests, thus reducing impact on these areas and improving the condition of their forests and the habitat they provide for species and as provides of ecosystem services.



Objectives, activities and monitoring.

Objective VFR1: By 2017, at least 10 village land forest reserves have been identified and gazetted expanding coverage from 1,270 (2005) to over 3,500 ha.

Objective VFR2: By 2017, each of the existing village land forest reserves will have an accepted and operational management plan that has been agreed at District level.

Objective VFR3: By 2017, at least 3 private forest reserves have been created in Kwamtili estate (East Usambara), Mufindi (Udzungwa) and Ambangulu (West Usambara), expanding the coverage of these reserves from nothing to at least 1,000 ha.

Objective VFR4: By 2017, rates of fire wood collection from the existing government forest reserves declines in those areas where village land forest reserves provide an alternative source of these materials (no baseline)

Activities

- Identify and survey potentially suitable village land forest reserve sites across the Eastern Arc.
- Hold workshop with district representatives on location and need for village land forest reserves.
- Identify village groups and conduct village meetings.
- Conduct resource assessment in the potential village land forest reserves.
- Complete management plan for the village land forest reserve
- Facilitate district council to endorse and declare village land forest reserve
- Assess rates of firewood extraction in the forests adjacent to a sample of Eastern Arc village sites.

Monitoring Plan to Expand Village Land, Community Based and Private Forest Reserves

<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective VFR1: By 2017, at least 10 village land forest reserves have been identified and gazetted expanding coverage from 1,270 (2005) to over 3,500 ha.					

Number of Village Land Forest Reserve declared and gazzetted	Training, awareness, meeting and dialog	Annually	FBD, DCFOs, DCFOs and villagers	2. Villages adjacent to JMAs in the Eastern Arc	Further detail on the issue of PFM in the Eastern Arc Mountains can be found in the thematic strategy on protected areas that can be downloaded from www.easternarc.or.tz
Objective VFR2: By 2017, each of the existing village land forest reserves will have an accepted and operational management plan that has been agreed at District level.					
Number of approved Village Land Forest Management Plans	Training, awareness, meeting and dialog	Annually	FBD, DCFOs, DCFOs and villagers	2. Villages adjacent to JMAs in the Eastern Arc	
Objective VFR3: By 2017, at least 3 private forest reserves have been created in Kwamtili estate (East Usambara), Mufindi (Udzungwa) and Ambangulu (West Usambara), expanding the coverage of these reserves from noting to at least 1,000 ha.					
Private Forest Reserves created	Training, awareness, meeting and dialog	Annually	FBD, DCFOs, DCFOs and Owners	3. Villages adjacent to the Eastern Arc	
Objective VFR4: By 2017, rates of fire wood collection from the existing government forest reserves declines in those areas where village land forest reserves provide an alternative source of these materials (no baseline)					
Number of woodlots established in a village. Number of household adopting and using Improved stoves	Awareness raising, tree planting and training on Improved stoves.	Annually	FBD, DCFOs, DCFOs and Villagers	3. Villages adjacent to the Eastern Arc	

IX. Strategy to Address Mining

9.1 Analysis of the Root Causes of this Threat

The Eastern Arc Mountains contain a number of valuable mineral resources, in particular gold, rubies, tourmaline and rhodolite garnet. There is also marble and some deposits of bauxite as well. The gold and semi-precious gem stones form the basis of an artisanal industry – which is generally illegal or close to illegal in the way that it operates. The mining for gold became a major issue in 2004 when it promoted the intervention by the then president Benjamin Mkapa- who noted that ‘water is more precious than gold’

Many thousands of miners operate across the Eastern Arc. When they learn of a new find of gold, for example, they can descend into an area in thousands. They typically mine in wetland areas and in streams, hence causing considerable damage to the aquatic systems and seriously polluting downstream water sources. The Amani Nature Reserve in the East Usambaras, among other protected areas, has experienced significant problems with these illegal miners. During the October 2006 meeting a mini-conceptual model was developed for mining that identified the following key factors to be solved in the mining issue:

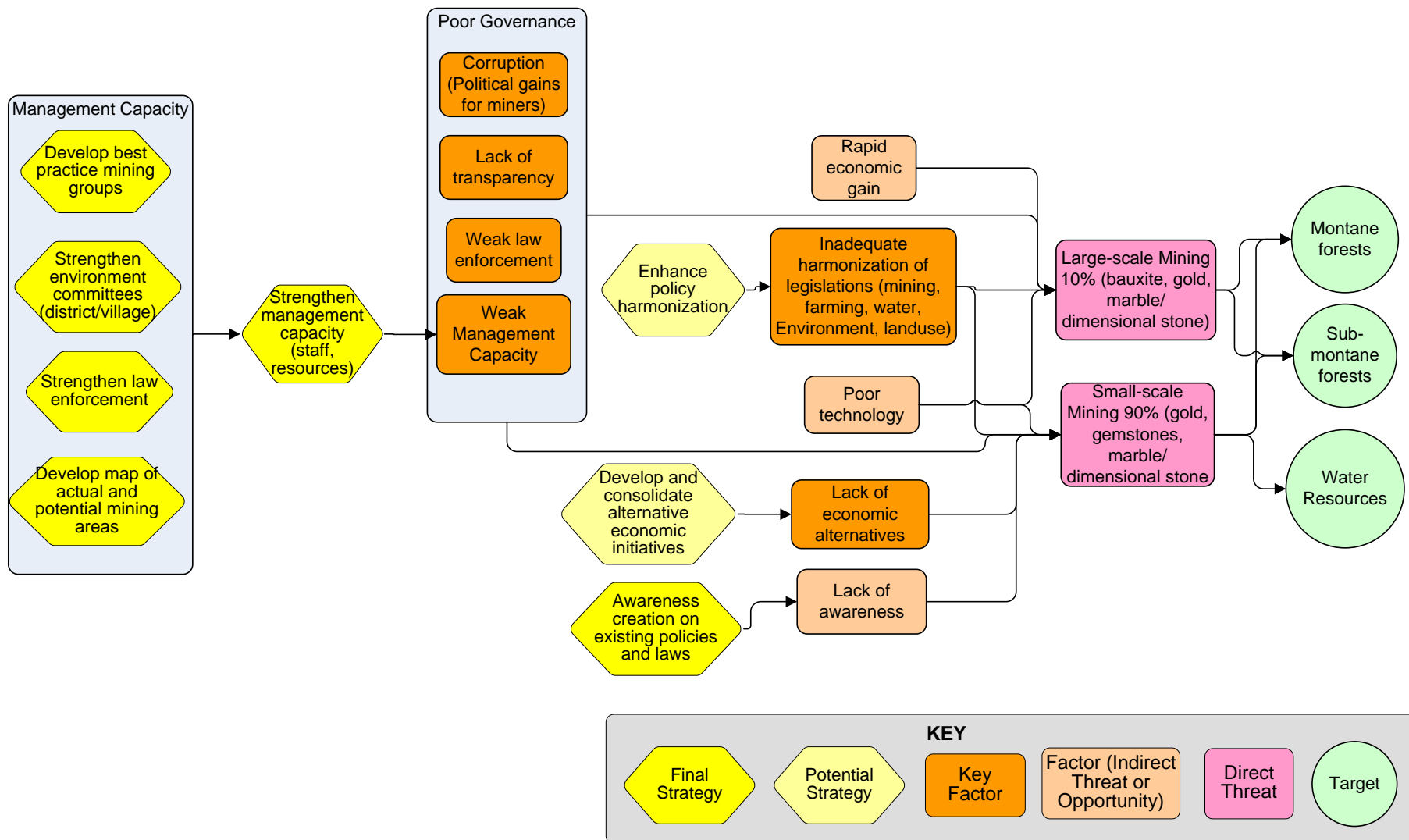
- Overall poor governance which is reflected in the following:
 - a. Lack of transparency, especially related to issuing licenses.
 - b. Corruption related to the miners and the money that they can make in a short period
 - c. Weak law enforcement
 - d. Weak management capacity.
- Inadequate harmonization of legislation (especially mining, water, forestry, land use, environment)
- Inadequate economic alternatives
- Lack of economically competitive poverty alleviating alternatives against the valuable mines.

These key factors were then used to identify the following strategies

- Strengthening management capacity (best practice mining groups, environment committees, law enforcement, map of mining areas)
- Awareness campaign of the existing policies and laws.

A pictorial representation of the mini-conceptual model for addressing illegal mining is presented below, followed by results chains for the strategies that are selected as priorities for intervention. Further detail on joint forest management and hunted species in the Eastern Arc can be found in the CMEAMF thematic strategies on ‘protected areas’ and ‘biodiversity conservation’ which can be downloaded from www.easternarc.or.tz.

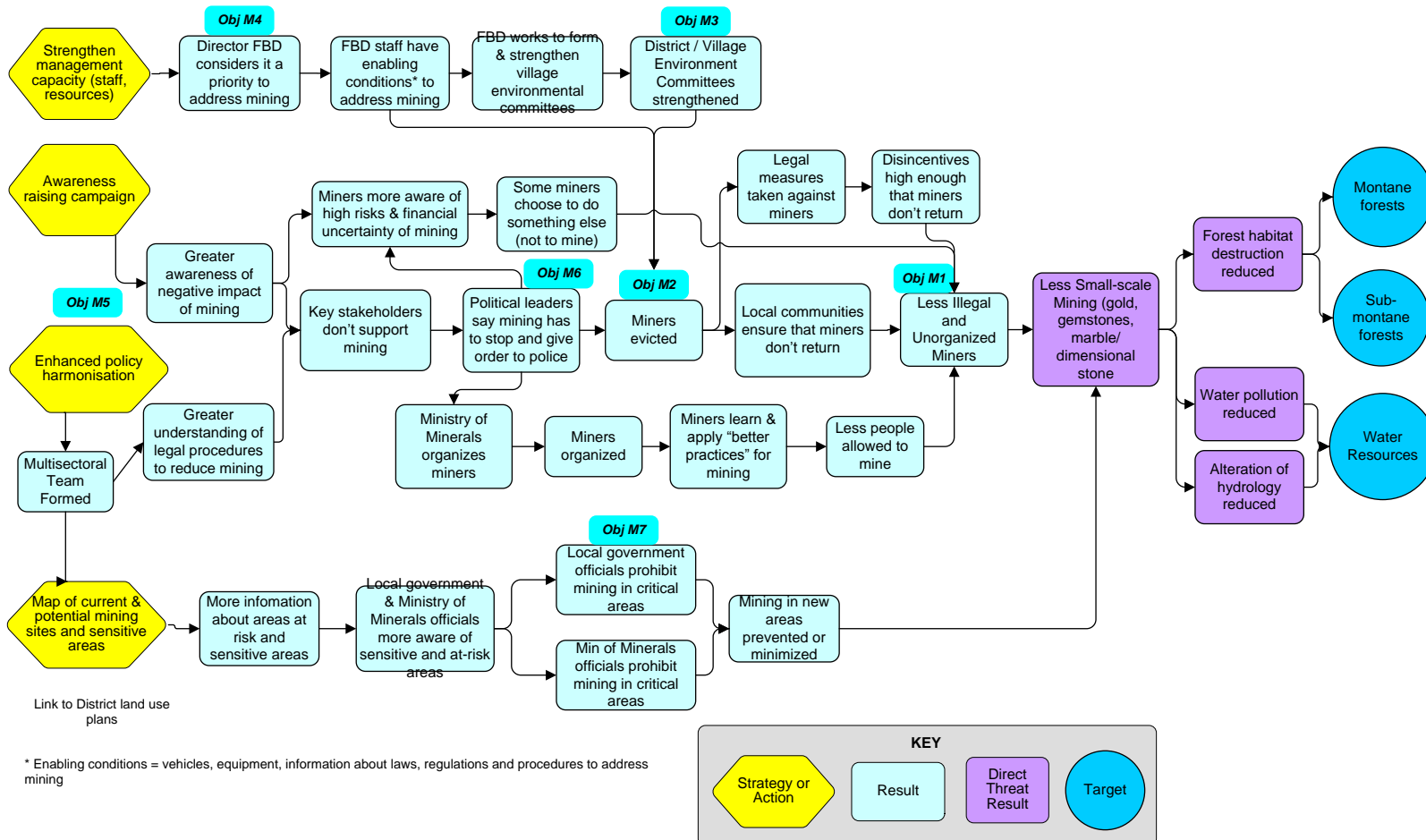
Mini-conceptual model for addressing the issue of mining within the Eastern Arc Mountains



9.2 Strategy to Strengthen Management Capacity and Raise Awareness to Address Small-Scale Mining

Results Chain

This results chain outlines four sub-strategies which, when implemented, would lead to an improvement in the situation of mining in the Eastern Arc Mountains. This in turn would prevent serious habitat damage to Eastern Arc Mountain forest and water resources as the mining is often concentrated along water courses.



Objectives, Activities and Monitoring

Objective M1: By 2017, number of illegal and unorganized miners in Eastern Arc Mountains declines from around 20,000 in 2005 (max over 40,000 in 2003) to under 5,000.

Objective M2: By 2010, all illegal miners are evicted from forest reserves in the Eastern Arcs Mountains.

Objective M3: By 2010, Village Natural Resources Committees created in all critical mining areas* and actively assist to control miners.

* East Usambara, West Usambara, Nguu, eastern slopes of Uluguru.

Objective M4: By 2008, the Director of Forestry allocates staff and resources to address mining issues in Eastern Arc Mountains.

Objective M5: By 2008, multisectoral teams are formed in 4 regions (Iringa, Morogoro, Dodoma and Tanga) to deal with mining issues in the Eastern Arc Mountains.

Objective M6: By 2012, the Vice-President Office classifies forest reserves of Eastern Arcs Mountains as fragile areas where no mining is allowed.

Objective M7: By 2010, District and Regional Commissioners and Ministry officials use habitat sensitivity map to prohibit mining in critical areas.

Activities

- Increase number and strengthen capacity of village environment committees
- Work with police to evict miners from Forest Reserves
- Form multisectoral teams to address mining issue
- Work with VPO Environment to classify Eastern Arc Reserves as fragile areas where mining is not allowed
- Develop sensitivity map for mining in the Eastern Arc Mountains

Monitoring Plan for mining strategy

<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective M1: By 2017, number of illegal and unorganized miners in Eastern Arcs Mountains declines from around 20,000 in 2005 (max over 40,000 in 2003) to under 5,000					
Number of illegal and unorganized miners in Eastern Arc Mountains evicted	Eviction, trials, arrests, Patrols Fined cases	Annually	Forest Department Staff, Local Government staff, police, politicians	Village, District level	Further detail on mining in the Eastern Arc can be found in the CMEAMF thematic strategies on 'protected areas', 'sustainable use' and 'biodiversity conservation' which can be downloaded from www.easternarc.or.tz
Objective M3: By 2010, Village Natural Resources Committees created in all critical mining areas* and actively assist to control miners. * East Usambara, West Usambara, Nguu, eastern slopes of Uluguru					
Number of Natural Resource Committees created	Village meetings	Annually	DFO, Respective managers, Village chairs	Eastern Arc Mountain zone	There will be a continued flow of funds from the Forest Division
Objective M5: By 2008, multisectoral teams are formed in 4 regions (Iringa, Morogoro, Dodoma and Tanga) to deal with mining issues in the Eastern Arc Mountains.					
Number of teams	District Full Council meetings	By 2008	PMORALG, Respective DED, RAS	Morogoro, Tanga, Kilimanjaro, Iringa, and Dodoma	
Objective M6: By 2012, the Vice-President Office classifies forest reserves of Eastern Arcs Mountains as fragile areas where no mining is allowed.					
Number of forest reserves classified	Sensitivity maps, VPO's notice	By 2012	VPO, Regional Commissioners, District Commissioners,		

X. Strategy to Address Hunting and Poaching

10.1 Analysis of the Root Causes of this Threat

The hunting of wild animals for food is widespread across the Eastern Arc Mountains. This includes common and widespread species, such as bushpigs and blue and red duiker, but also species that are narrow ranging and endemic, such as Abbots duiker, red colobus and the Sanje mangabey.

The rates of hunting are hard to reliably establish, but in all forests studied that are close to human habitation there is evidence of various forms of hunting, typically involving snares, various forms of traps, and hunting with dogs. In the more remote areas of the Eastern Arc there are still large mammals present in the forests, but these are typically hunted out in areas that have a higher density of people. There is a general progression in the hunting from the large mammals in the remote areas, through medium sized species and finally to rodents and other smaller species when the larger ones have all been hunted out.

In the October 2006 planning meeting the following were identified as key factors driving hunting:

- Cultural factors
- Need for protein
- Crops, human and livestock protection

By considering these key factors the following strategies were developed:

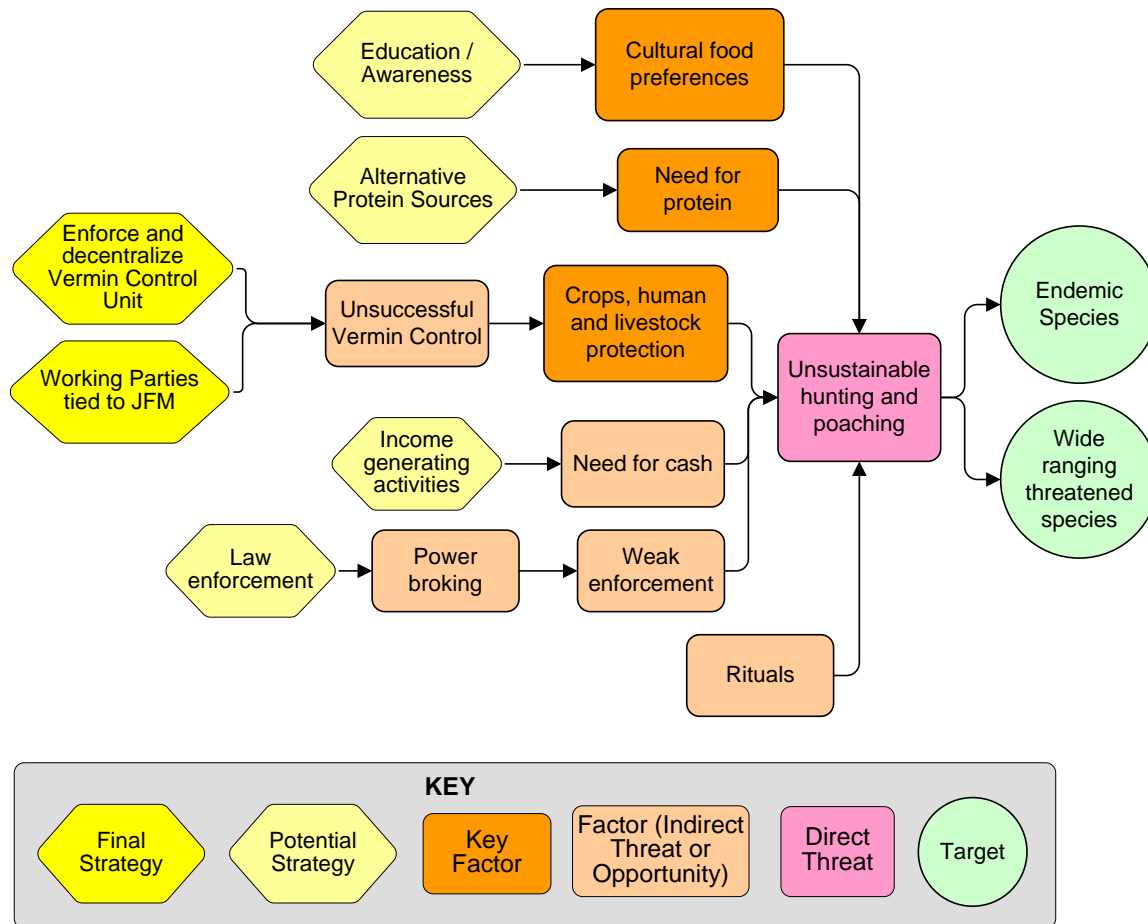
- Enforce and decentralize vermin control units
- Develop working parties tied to FJM agreements
- Education and awareness
- Alternative protein sources
- Ecotourism and other income generating activities
- Law enforcement

A pictorial representation of the mini-conceptual model for addressing hunting and poaching is presented below, followed by results chains for the main strategies that are selected as priorities for intervention. Further detail on joint forest management and hunted species in

the Eastern Arc can be found in the CMEAMF thematic strategies on ‘protected areas’, ‘sustainable use’ and ‘biodiversity conservation’ which can be downloaded from www.easternarc.or.tz.

Mini conceptual model for hunting and poaching in the Eastern Arc Mountains

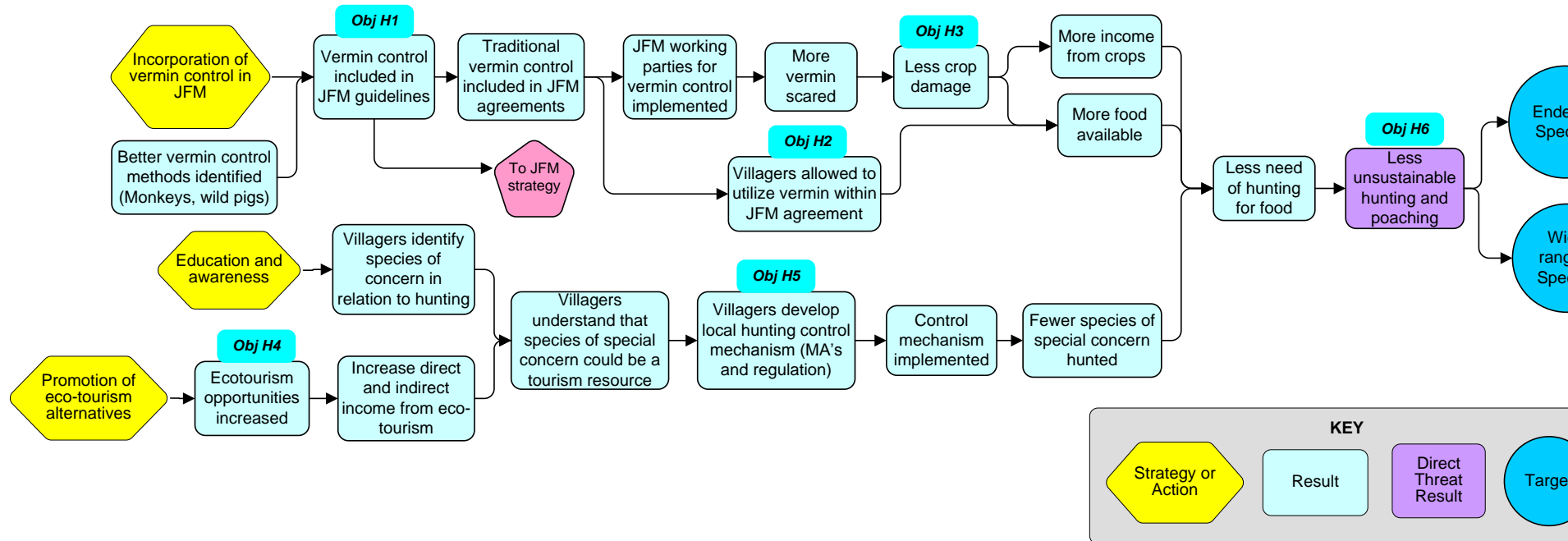
This model identifies the strategies that could help reduce unsustainable hunting within the Eastern Arc Mountains and hence assist in the conservation of the endemic species that are found in these mountains, and the threatened wider ranging species that also occur in some areas.



10.2 Promote Hunting Control and Management within Joint Management Agreements

Results Chain

This results chain indicates how the various sub-strategies identified in the conceptual model can be implemented, leading to a reduction in the unsustainable hunting that is going on in the Eastern Arc Mountains. This in turn would lead to improved populations of the hunted endemic species within these mountains (e.g. Abbots duiker), and the already threatened wider ranging species that are found here (e.g. elephant)



Objectives, Activities and Monitoring

Objective H1: By 2017, at least five signed Joint Management Agreements prevent hunting of species of special concern*.

Objective H2: By 2010, at least five JMAs allow vermin control as a benefit to the local community.

Objective H3: By 2010 (2012), crop damage by vermin in JFM areas where vermin control is allowed is reduced significantly

Objective H4: By 2012, the number of ecotourists in the EAMF increases from around 4,000 per annum (2005 estimate) to over 8,000 per annum.

Objective H5: By 2008, JFM guidelines incorporate vermin control as potential benefit to the local communities.

Objective H6: By 2017, incidences of hunting decreased (by 80%) significantly in those forests with functioning JMAs and where the hunting baseline exists (Mtai in East Usambara, New Dabaga in the Udzungwas, West Kilombero Scarp in the Udzungwas)**

*Eastern Arc endemics most threatened by hunting are : Abbots duiker, Iringa Red colobus monkey, Sanje mangabey. Elephant is a wide ranging threatened species that is also impacted by hunting in some areas.

** These are the only sites where there is reasonable baseline for rates of hunting in terms of numbers of traps/snares etc per unit area of forest

Activities

- Prepare and operationalize JMA arrangements that prevent the hunting of endemic and threatened Eastern Arc species
- Prepare and operationalize JMA agreements that allow hunting of crop raiding vermin species on a trial basis
- Undertake monitoring of numbers of Ecotourists in the main tourism centers of Amani, Udzungwa, Uluguru
- Undertake detailed assessments of the rates of hunting in different Eastern Arc Forest Reserves

Monitoring Plans for Hunting and Poaching

<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective H1: By 2017, at least five signed Joint Management Agreements prevent hunting of species of special concern*.					
Number of signed JMA	Records	Every year	FBD, WD and Villages government	FBD, WD, Villages	Further detail on joint forest management and hunted species in the Eastern Arc can be found in the CMEAMF thematic strategies on 'protected areas', 'sustainable use'

					and ‘biodiversity conservation’ which can be downloaded from www.easternarc.or.tz
Objective H2: By 2010, at least five JMAs allow vermin control as a benefit to the local community.					
Number of JMAs allowing Vermin Control	Records	Every Year	FBD, WD, Village Governments	FBD, WD and Villages	-
Objective H3: By 2012, crop damage by vermin in JFM areas where vermin control is allowed is reduced by 60%					
% crop damage by vermin	Field Surveys and Records	Every Farming Season	MAFSC, FBD, WD, District Governments, Village Governments	MAFSC, FBD, WD, Districts, Villages	-
Objective H4: By 2012, Number of ecotourists in the EAMF increases from around 4,000 per annum (2005 estimate) to over 8,000 per annum.					
Number of Ecotourists/Visitors	Records and Reports	Every Year	FBD, Tourism Division (TD), District Councils, Village Governments	FBD, TD, Districts, Villages	-
Objective H5: By 2009, JFM guidelines incorporate vermin control as potential benefit to the local communities.					
JFM Guidelines incorporating Vermin Control as Benefits	Records and Reports	Every 5 Years	FBD, WD District Councils, Village Governments	FBD, WD Districts, Villages	-
Objective H6: By 2017, Rates of hunting decreased by 80% in those forests with functioning JMAs and where the hunting baseline exists					
Number of Traps/snares per Unit Area	Field Surveys, Records and Reports	Every Year	FBD, WD, District Councils, Village Governments	FBD, WD, Districts, Villages	-

XI. Strategy to Address Invasive Species

11.1 Analysis of the Root Causes of this Threat

Invasive species pose an increasing threat to biodiversity globally. In the Eastern Arc Mountains it is increasingly being appreciated that invasive alien species of trees, shrubs, lianas and herbs are invading the area – including entering the natural forest and outcompeting the natural vegetation that is found there, often replacing the area with a pure stand of alien invasive species.

The past problems with the invasive tree *Maesopsis eminii* in the East Usambara Mountains are well known, but it is becoming increasingly clear that there are also invasive species issues in the North and South Pare Mountains, the Ulugurus, and the Udzungwas. Indeed, these problems may be increasing in every mountain block. At this time there are no control measures in place to halt the spread of these species, indeed those in management positions are often not aware of this issue. Consequently, although this strategy was prioritized as one of the lowest threats at the present time, its potential to become a much more significant problem over the next few years is large.

The mini-conceptual model that was developed for the threat posed by invasive species identified the following key factors for invasive species:

- Higher value and faster growing (more competitive species)
- Strong competitiveness including higher ability to adapt, regenerate and thrive naturally.

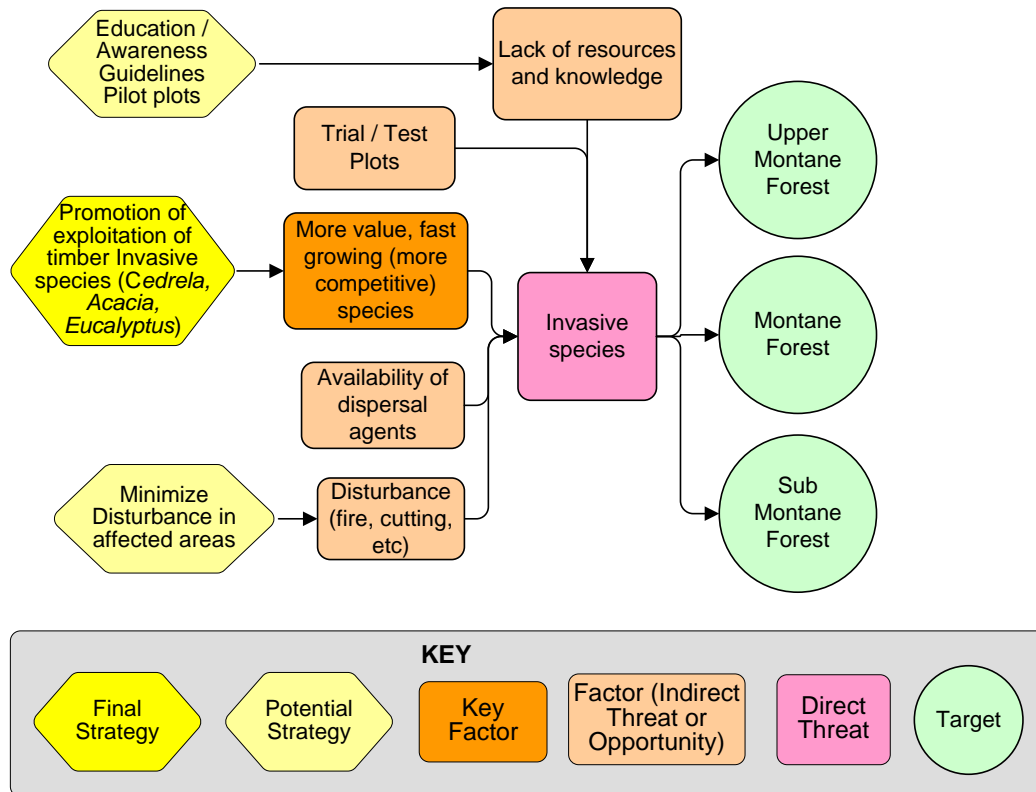
The strategies proposed to address these factors are:

- Strengthening research, education and awareness about invasive plant species.
- Promote the exploitation (local harvesting) of invasive timber species
- Minimise disturbance in affected areas
- Development of guidelines for management of invasive species.

A pictorial representation of the mini-conceptual model for addressing invasive species is presented below, followed by results chains for the main strategies that are selected as priorities for intervention. Further detail on invasive species can be found in the CMEAMF thematic strategy on ‘sustainable use’ which can be downloaded from www.easternarc.or.tz.

Mini-conceptual model for invasive species

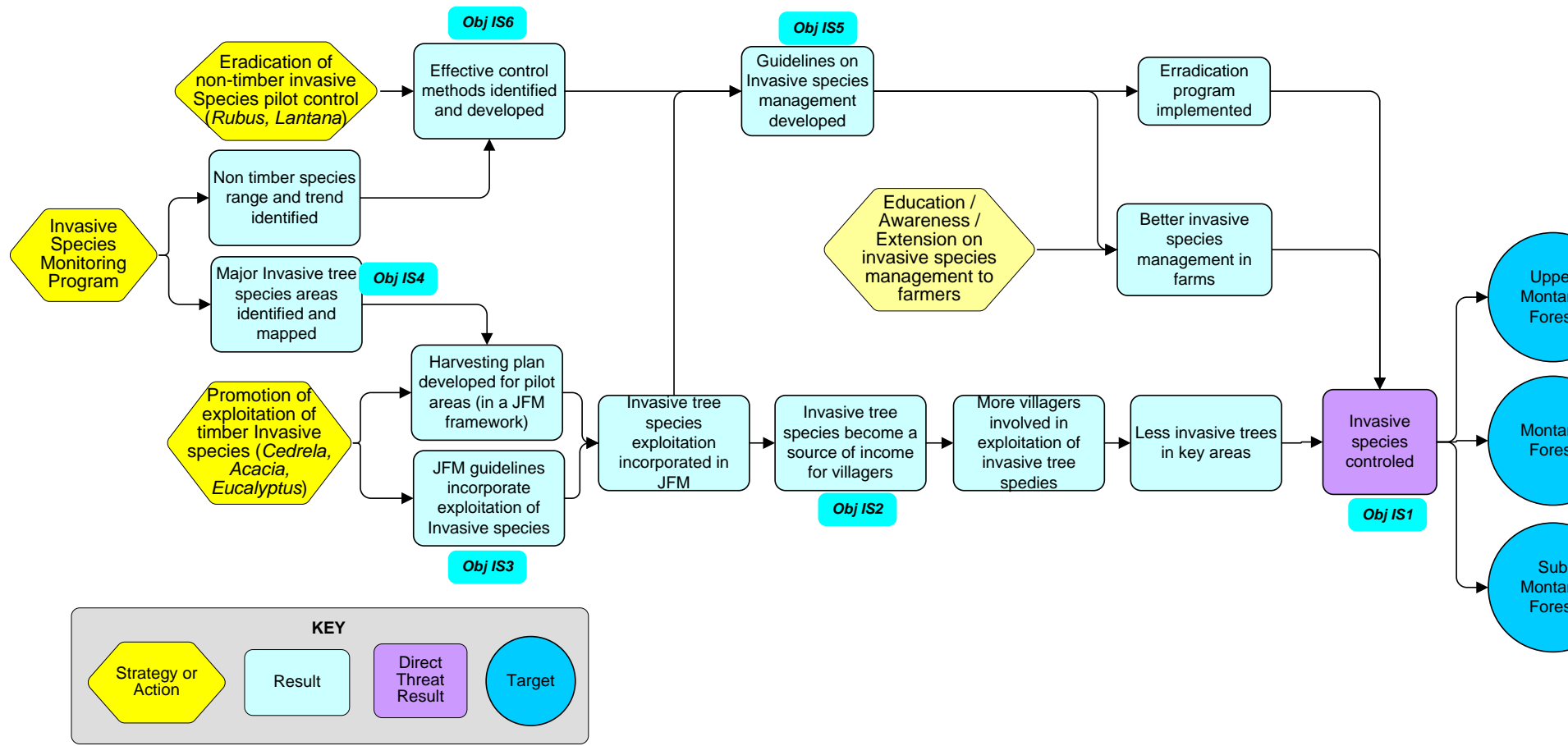
This model outlines the proposed strategies that might be employed to address the problem of invasive species in the Eastern Arc Mountains that are starting to invade the Eastern Arc Mountains forest habitats.



11.2 Strategy to Reduce the Expansion of Invasive Species

Results Chain

This results chain outlines the sequence of events that needs to occur from each of the identified sub-strategies in order to tackle the threat of invasive species in the Eastern Arc Mountains. If implemented then it is expected that these strategies would lead to a reduction in invasive species in these mountains, thus preventing a reduction in the quality of the habitat in the Eastern Arc Mountain forests.



Objectives, Activities and Monitoring

Objective IS1: By 2017, area and scale of invasive species problems (especially involving *Eucalyptus*, *Acacia*, *Cedrela mexicana* and *Lantana camara*) reduced significantly in worst affected areas across the Eastern Arc (East Usambara, North and South Pare Mountains, Uluguru).

Objective IS2: By 2010, at least 10 villages under JMF are benefiting* from the utilization of invasive woody species.
*level of benefits to be determined by management plans.

Objective IS3: By 2008, JFM guidelines allow exploitation of invasive species by participating communities.

Objective IS4: By 2009, the severity of damage to habitats by invasive tree species is mapped across the EAMF.

Objective IS5: By 2015, guidelines on management of invasive species are developed and ratified by FBD.

Objective IS6: By 2015, effective control methodology of invasive species is developed.

Activities

- Complete JFM guidelines and ensure that they allow the exploitation of invasive species
- Include the exploitation of invasive species within JFM agreements
- Investigate methodologies for the control of invasive species
- Map the extent of distribution and severity of invasion of natural habitats by invasive species

Monitoring plan for invasive species

<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective IS1: By 2017, area and scale of invasive species problems (especially involving <i>Eucalyptus</i> , <i>Acacia</i> , <i>Cedrela mexicana</i> and <i>Lantana camara</i>) reduced significantly in worst affected areas across the Eastern Arc (East Usambara, North and South Pare Mountains, Uluguru).					
2 Species of of invasive spp 40% of the affected area	Exploitation of commercial spp	2017	FBD, relevant stakeholders	East Usambara, North & South Pare	Further detail on invasive species can be found in the CMEAMF

	In situ conservation, Physical eradication			mountains	thematic strategy on ‘sustainable use’ which can be downloaded from www.easternarc.or.tz
Objective IS2: By 2010, at least 10 villages under JMF are benefiting* from the utilization of invasive woody species.					
10 villages, 5 management plans 10 JMAs signed by villages & FBD/Local Authority	JFM plans for effective management of invasive spp	Annually	FBD, Local Authority, NAFOBEDA	Eastern Arc Forest Reserves	
Objective IS4: By 2009, the severity of damage to habitats by invasive tree species is mapped across the EAMF.					
Severity levels /criterion developed 60% of the affected areas	Remote Sensing & GIS	2009	SUA/IRA/UCLAS, FBD, TAFORI	East Usambaras, Pare Mts, Uluguru Mts	

XII. Strategies to Address Unsustainable Collection for the Pet Trade

12.1 Analysis of the Root Causes of this Threat

There is a thriving trade in animals (and to a lesser extent plants) from the Eastern Arc Mountains forests to foreign pet owners. The preferred species are those which are endemic to the Eastern Arc Mountains region and which are small enough in size to keep in a cage or a tank in a normal western house. This includes several species of chameleons (especially those with horns), amphibians (especially tree frogs) and some of the larger types of insects (beetles and millipedes). A few types of birds are also collected for the pet trade, but these tend to be for specialist collectors who have facilities to cater for the larger birds and their demands for space, warmth and specialized foods.

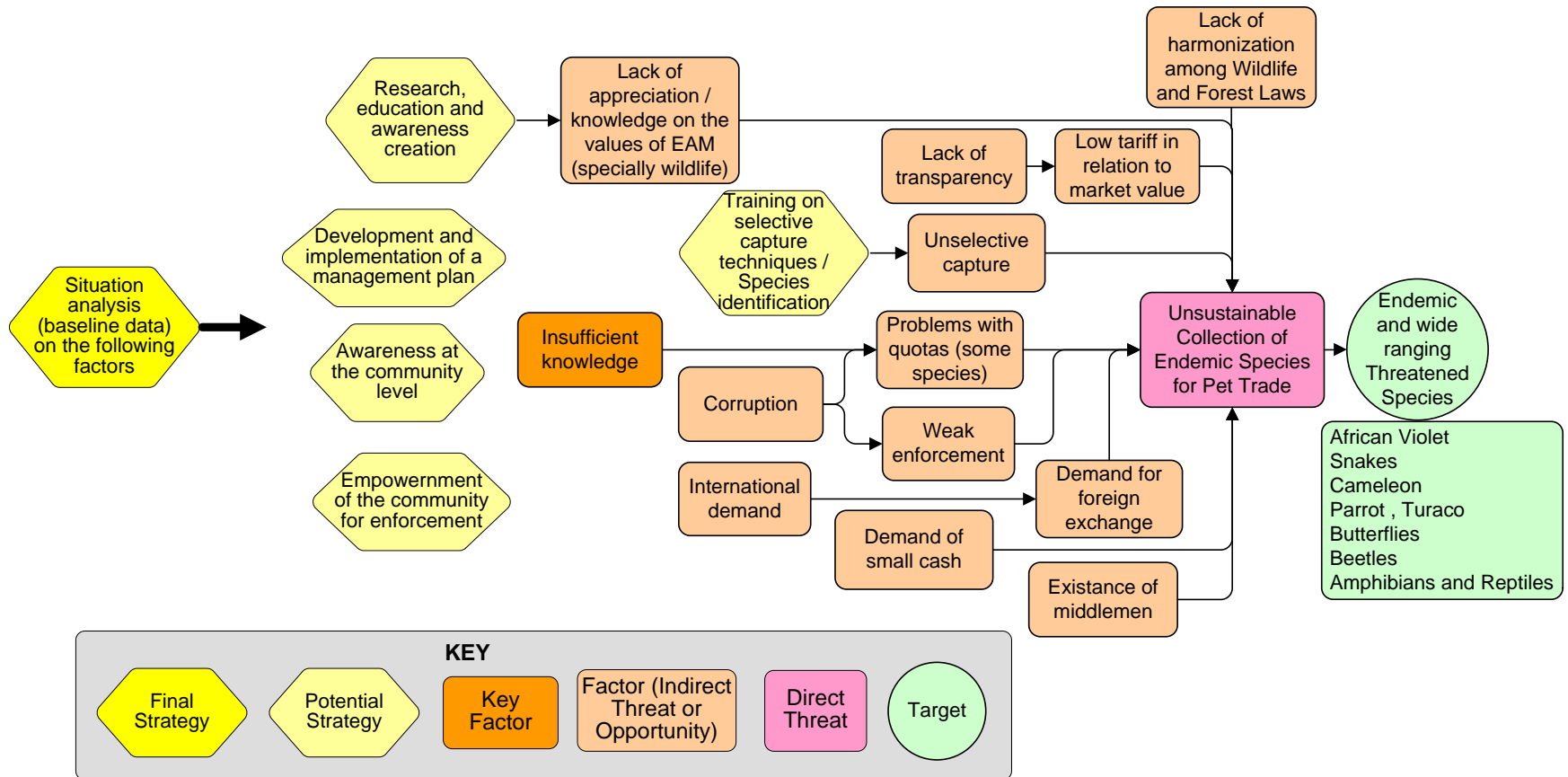
Tanzania sets quotas for the export of these various types of animals, and these quotas are enforced by the Wildlife Division in Dar es Salaam. The animals being exported are inspected prior to being allowed out of the country. The scientific basis for some of the quotas is not especially clear as some are species of chameleons that are only known from one or two mountain blocks where the populations, and hence the levels of sustainable offtake, are unknown.

The October 2006 planning meeting developed a mini-conceptual model that identified the key factors that impact on the unsustainable collection of Eastern Arc endemic and near-endemic animals and plants for the pet trade. The key factors are:

- Insufficient knowledge
- Economic benefits of the trade to involved individuals
- Weak law enforcement and trade regulation mechanism
- Low royalty tariffs
- Lack of transparency in the business, including issuing of permits
- Poor management, lack of inventory

A pictorial representation of the mini-conceptual model for addressing the pet trade is presented below, followed by results chains for the main strategies that are selected as priorities for intervention. Further details of the species under trade in the Eastern Arc Mountains are found in the CMEAMF thematic strategy on 'biodiversity conservation'. This document can be downloaded from www.easternarc.or.tz.

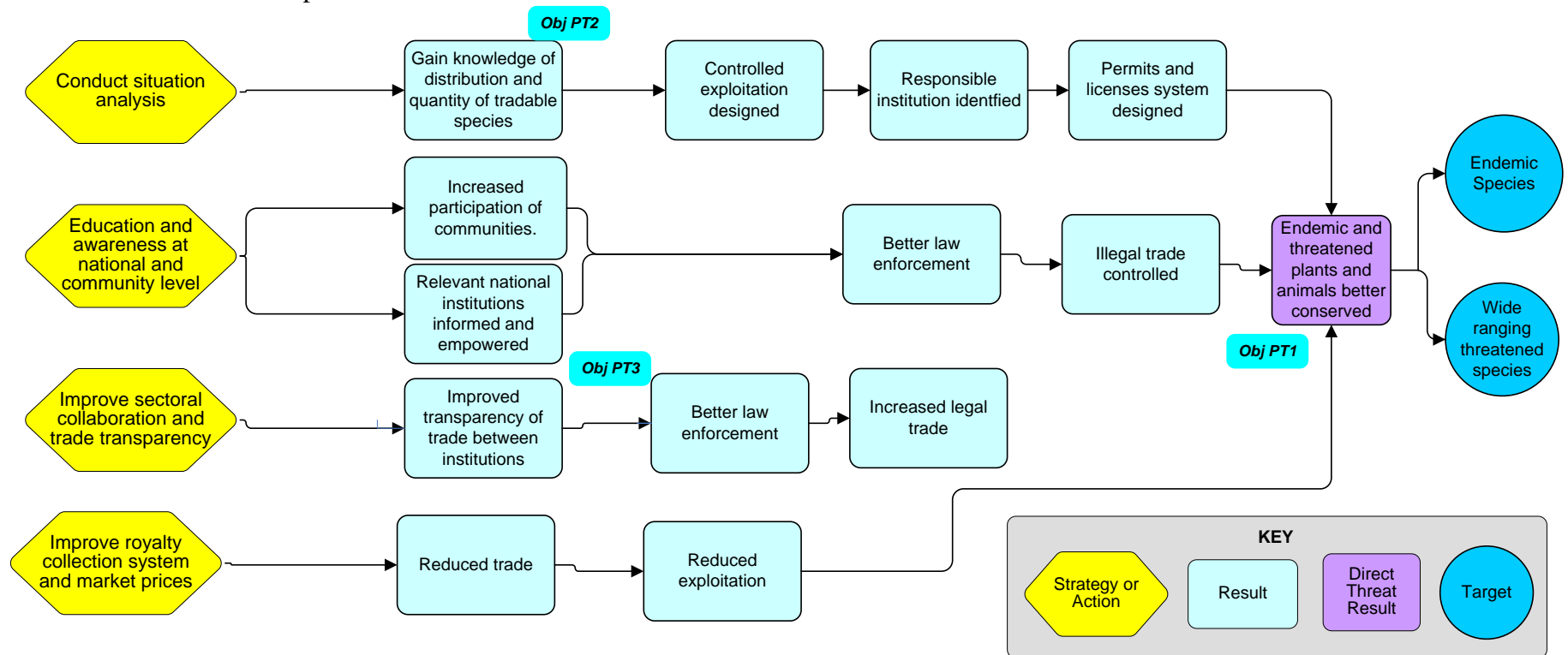
Mini-conceptual model for the pet trade in wildlife species from the Eastern Arc Mountains



12.2 Strategy for reducing impact of pet trade on endemic and threatened species

Results Chain

This results chain outlines the sequence of events that needs to occur from each of the identified sub-strategies in order to tackle the threat to the Eastern Arc Mountains endemic and threatened species of animals and (to a lesser extent) plants. If implemented then it is expected that these strategies would lead to a reduction of the threat posed by collectors for the international pet trade, thus assisting the conservation of several species.



Objectives, Activities and Monitoring

Objective PT1: Controlled exploitation effected by 2017

Objective PT2: Inventory of the exploited animals in place by 2012

Objective PT3: Streamlined and transparent licensing mechanism reviewed

Activities

- Complete JFM guidelines and ensure that they allow the exploitation of invasive species
- Include the exploitation of invasive species within JFM agreements
- Investigate methodologies for the control of Invasive Species
- Map the extent of distribution and severity of invasion of natural habitats by invasive species

Monitoring plan for pet trade

<i>WHAT (Indicators)</i>	<i>HOW (Methods & Tasks)</i>	<i>WHEN</i>	<i>WHO</i>	<i>WHERE</i>	<i>Comments</i>
Objective PT1: Controlled exploitation effected by 2017					
Controlled exploitation effected by 2017	Law enforcement Awareness creation	2008	WD, FBD, Local community, District councils, NGO, Other stakeholders	Eastern Arc Forest	Further details of the species under trade in the Eastern Arc Mountains are found in the CMEAMF thematic strategy of 'biodiversity conservation'. This document can be downloaded from www.easternarc.or.tz
Objective PT2: Inventory of the exploited animals in place by 2012					

Inventory of the exploited animals in place by 2012	Animal survey Plant survey Mapping of the distribution	2012	TAWIRI, TAFORI, SUA, FBD, ANR	Forest blocks of Eastern Arc Mountains	
Objective PT3: Streamlined and transparent licensing mechanism reviewed					
Licensing mechanism reviewed	Gather information Involve stakeholders Develop pricing policy	2010	MNRT, Local government, NGO, Traders, Trade and Industries	WD	

Cross cutting issues

During the course of the strategy development process a number of issues were identified that were not a threat and hence were not picked up using the primarily threat-based strategy development process. However, several of these issues are regarded as so important that they deserved their own section within this Eastern Arc conservation plan.

Declining Water quantity and quality

One of the important attributes of the Eastern Arc Mountains is their provision of clean water all year round. This is particularly important because the mountains are the source of water for large urban areas, such as Dar es Salaam, Tanga and Morogoro, but also because they are also the sources of the majority of the water that flows to the main hydroelectrical power generation plants at Kihansi, Kidatu and Mtera. As such, the maintenance of these values is of critical importance. An outline of how these should be addressed is presented below, derived from the results of the June 2006 strategic planning meeting for the Eastern Arc. In addition to the work done at the June 2006 planning meeting relevant information was also contained in the CMEAMF consultancy report - a 'Hydrological Analysis for the Eastern Arc Mountain Forests' and 'mechanisms for payments for water ecological services in the Rufiji Basin' that are available on www.easternarc.or.tz. These documents also provide some concrete recommendations on what needs to be done in the Eastern Arc region, and we have used these recommendations in this section.

Desired State	Objectives and Activities	Indicators / Targets
Water quality/quantity improved in rivers flowing from Eastern Arc	<p>Objective: To develop a hydrological monitoring system for key Eastern Arc rivers to monitor water flows and water quality.</p> <p>Activities</p> <ul style="list-style-type: none"> ▪ Provide training to technicians responsible for the gauging stations and for water quality sampling and analysis. ▪ Rehabilitate the non-operational hydrological and climatological monitoring stations and establish new stations in critical areas. ▪ Sensitize communities not to tamper with water gauging stations. 	Number of rivers which are measured and data compiled on a regular basis increased from 19 (2005) to 30 by year 2016 (has to be done by Water Ministry River Basin Authorities)
	<p>Objective: To improve conservation and management of water sources in the EAM.</p> <p>Activities</p> <ul style="list-style-type: none"> ▪ Support water user associations in Eastern Arc communities to manage local water sources. ▪ Promote agroforestry as a sustainable agricultural practice. 	Number of critical water sources which are not disturbed by human activities within 60m from water sources (no baseline)

	<p>Objective: To improve river bank protection along rivers flowing from the EAM.</p> <p>Activities</p> <ul style="list-style-type: none"> ▪ Plant appropriate species along river banks. ▪ Relocate people farming within 60 m of the river banks. ▪ Demarcate areas to be protected along river banks. ▪ Raise awareness on the importance of not farming within 60 m of water sources. 	<p>Number of kilometers of river bank originating from the EAM forests with no human activities likely to compromise conservation within 60m of river (no baseline)</p>
	<p>Objective: To raise awareness of stakeholders on issues of water source protection.</p> <p>Activities</p> <p>Included within Education and Awareness – see below</p>	<p>90% of EAM community representatives (increased from 2004 baseline of 79%) mention water as a forest value by 2016.</p>

Insufficient Awareness

A strategy for Information, Education and Awareness for the Eastern Arc Mountains has already been developed by the Tanzania Forest Conservation Group and is already under implementation (see document on www.easternarc.or.tz). Implementing this strategy is a clear priority for the coming years, as is measuring the progress to achieve the goal of enhanced awareness, leading to better management decisions within the Eastern Arc. The Information, Education and Awareness document also provides a baseline on the levels of knowledge of the Eastern Arc Mountains within various villages and districts. A summary of what needs to be done across the Eastern Arc is outlined below:

Desired state	Objectives	Indicators / Targets
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<p>Stakeholders at local, national and international level have sufficient knowledge of the values and threats of the EAM forests and are using this knowledge to participate in the conservation of the Eastern Arc Mountain forests.</p>	<p>Objective. To increase key stakeholder’s understanding of the value of Eastern Arc Mountain forests, the threats that they currently face and the importance of investing in their sustainable management.</p> <p>Activities</p> <ul style="list-style-type: none"> ▪ Publish Arc Journal and Komba (TFCG) ▪ Publish posters, leaflets etc ▪ Programmes on radio and television ▪ Newspaper articles ▪ Technical reports and papers 	<p>40 % of village government leaders (from 30 % in 2004), 85 % of district officers (from 72% in 2004), 30 % of MPs (no baseline) and 30 % of central government staff in relevant ministries (from less than 30% in 2004) are familiar with the term ‘Eastern Arc Mountains’ or ‘Milima ya Tao la Mashariki’ and are aware of key biological, economic and hydrological values as well as the threats to the EAM forests.</p>
	<p>Objective. To raise awareness on the National Forest Policy and Forest Act and to encourage feedback and participation from Eastern Arc Mountain stakeholders.</p> <p>Activities</p> <ul style="list-style-type: none"> ▪ Hold seminars at District, Ward, Village ▪ Distribute policies at District and lower levels ▪ Translate English versions into Kiswahili ▪ Promote policies and laws in popular media such as the newspapers ▪ Make policies and laws available on the internet 	<p>80% of District Natural Resource Officers, District Planning Officers and District Executive Directors (from 50% in 2004) and 30% of village government leaders (from 9% in 2004) in Eastern Arc Mountain districts are familiar with the National Forest Policy and Forest Act by 2016.</p>
	<p>Objective. To guide stakeholders to implement formal and informal environmental education and information sharing activities in a more effective and coordinated way within the Eastern Arc Mountains.</p>	<p>Environmental education activities relating to the values of and threats to the EAM forests are being undertaken in all Eastern Arc districts.</p>

	<p>Activities</p> <ul style="list-style-type: none"> ▪ Establish an environmental education network for Tanzania ▪ To hold joint seminars ▪ To develop joint education materials that can be used by different actors 	
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Insufficient Finance

Another critical issue within the context of the Eastern Arc Mountains is the development of one (or a set of) sustainable financing mechanisms that will provide a greater level of funds for management and for community actions than are currently available. A number of different existing and potential mechanisms exist to enhance the sustainable finances available within this ecoregion. The various ways to generate sustainable finance that are regarded as feasible in the Eastern Arc are as outlined below. This work builds on CMEAMF consultancies to develop ‘mechanisms for payments for water ecological services in the Rufiji Basin’ and ‘mechanisms for carbon payments for the Eastern Arc Mountains’ that are available on www.easternarc.or.tz. They also build upon the recommendations of a CEPF funded consultancy to identify sustainable funding opportunities in the region (see www.cepf.net).

Desired State	Objectives and Activities	Indicators
Sustainable funding mechanisms for forest conservation established through payments for environmental services schemes (water, carbon and biodiversity)	Objective: To develop and implement transparent mechanisms for water payments to support management of catchment forests and local community development.	System agreed and established for water revenue sharing by 2010 Percentage of revenue paid by water users to water basin authorities returned to catchment forest managers and local communities to support forest conservation activities by 2010
	Objective: To identify and operationalise ‘afforestation’ and ‘deforestation-reduced’ carbon payments for the benefit of local communities and catchment forest managers.	Percentage of revenue generated from carbon payments returned to catchment forest management and local communities by 2010

	<p>Activities</p> <ul style="list-style-type: none"> ▪ Awareness raising on carbon payments at local and national levels. ▪ Establish accurate baseline data on carbon stored in the EAM and deforestation rates. ▪ Support dialogue on roles, responsibilities and the flow of benefits related to carbon trading on EAM forests. ▪ Establish pilot projects in the EAM. 	
	<p>Objective: To expand and scale up the activities of the existing EAMCEF.</p> <p>Activities</p> <ul style="list-style-type: none"> ▪ Align EAMCEF investment with the Eastern Arc strategy. ▪ International fund raising to increase capital of EAMCEF. 	<p>Conservation endowment fund capital base increases from \$7 million to \$14 million by 2016</p> <p>Annual disbursement to field projects increased in line with increase in capitalisation</p>
	<p>Objective: To tap other sources of funding e.g. tourism, research for investment in the</p> <p>Activities</p> <ul style="list-style-type: none"> ▪ Support dialogue with research agencies such as TAWIRI and COSTECH so that research funds from work in the EAM is used for the benefit of the EAM. ▪ Plan and implement fund raising activities complementary to those recommended by the CEPF sustainable financing strategy. 	<p>10% of revenue from research and tourism feeding back into conservation of the EAM.</p> <p>Complementary fund raising activities being undertaken to those outlined in the CEPF sustainable financing strategy.</p>

	Objective: To operationalise the forest fund outlined in the Forest Act so that funds generated from the forests can be reinvested in research, patrols and management of the reserves.	System in place and functioning to channel funds from Forest Fund to management of the EAM.
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Adverse climate change

The issue of climate change is one that might have dramatic consequences for the Eastern Arc Mountains – particularly as it may render the mountains unsuitable climatically for some of the endemic species that are currently found there. However, at this time, the existing climate models seem imprecise for the Eastern Arc region and further work is required in order to make them more useful and relevant for the area. Hence, at this time, the main activity that is proposed on climate change in the Eastern Arc Mountains is further research and the development of locally relevant models. However, there is one practical issue that can be done to address the potential impacts of climate change, which is to work to enhance the connectivity of the forests in the Eastern Arc as that will allow species a better chance to move along climatic gradients as the climate changes.

Desired State	Objectives	Indicators
Climate change mitigation measures in place	To model the predicted effects of climate change on the forest habitats and on the communities living around the mountains.	Monitoring model in place and providing predictions on the effects of climate change on Eastern Arc Mountains in place by 2008
	To support participation of Eastern Arc stakeholders in negotiations on CDM to include deforestation reduced.	Funds for deforestation reduced are flowing into the Eastern Arc Mountains.
	To develop capacity in Tanzania to tap into the voluntary carbon market for deforestation reduced.	Pilot project operational channeling funds for deforestation reduced from the voluntary market to Eastern Arc Mountains.
	To increase forest connectivity to enhance the natural resilience of remaining forests to the predicted effects of climate change	Reduction in forest fragmentation statistics (as calculated by GIS methods) by 2016.

	To develop mitigation measures to reduce the impact of climate change on the communities living in the Eastern Arc.	Mitigation strategy in place and functioning.
	To create awareness amongst local and national stakeholders on the nature, causes, impacts and mitigation measures for climate change in the Eastern Arc Mountains.	30% of village leaders and 60% of district officers aware of the impact of climate change on Eastern Arc Mountains.
	Using the results of research currently ongoing develop a strategy to address climate change in the Eastern Arc mountains and link this with the national climate change strategy.	Strategy in place and functioning to address the impact of climate change on the Eastern Arc mountain forests.

Management and Implementation

It is proposed that the implementation of this strategy is coordinated by an inter-Ministerial committee made up of representatives of the key stakeholders managing the Eastern Arc and who rely upon the ecological services it delivers. Proposed members are as follows:

Vice Presidents Office (Environment)
Ministry of Natural Resources and Tourism
Ministry of Lands
Ministry of Livestock and Water
TANESCO
Ministry of Agriculture
Ministry of Mines
Prime Ministers Office – Local and Regional Government

The group should be convened to assist with the smooth implementation of the strategy, and to monitor the achievement of its established indicators over time. It is suggested that an annual meeting, convened by the Vice Presidents Office (Environment) would provide the relevant forum to achieve the goal of overall coordination.

Strategy implementation

The implementation of this strategy is the responsibility of all those who helped in its development, this includes various Ministries, Departments within Ministries, and a number of local and international NGOs. Each agency has a role to play, but there are several issues that form pre-requisites for successful implementation:

- District Councils need to incorporate elements of the strategy into the District Development Plans for each of the 15 Eastern Arc Districts.
- Forestry and Beekeeping Division – especially the ‘Catchment and Mangroves Management Programme’ also needs to take up the various forestry challenges raised here, and in particular needs to implement the elements relating to PFM (JFM and CBFM) and the development of a comprehensive protected area network.
- The Eastern Arc Mountains Conservation Endowment Fund should be encouraged to adopt the basic elements of this strategy and align its grant making capacity to help implement Eastern Arc strategy elements
- The various NGOs and private sector actors that support the work of the Forestry and Beekeeping Division and the local government authorities are encouraged to help take on elements of the strategy to assist in its implementation (and monitoring).

Back inside page

Key documents produced by Conservation and Management of the Eastern Arc Mountain Forests (CMEAMF)

Baseline reports

FBD 2005a. *Hydrological Values*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2005b. *Education and Awareness*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2005c. *Biodiversity*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2005d. *Forest Area*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2005e. *Forest Condition, Threats and Management Effectiveness*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

Thematic strategies

FBD 2005. *Information, Education and Awareness*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2006a. *Biodiversity Conservation*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2006b. *Monitoring*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2006c. *Protected Area Network*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2007a. *Sustainable Forest Use*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2007b. *Fire Reduction*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2007c. *Water Ecological Services*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

FBD 2007d. *Carbon Ecological Services*. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Dar es Salaam. www.easternarc.or.tz

BACK PAGE

The “Conservation and Management of the Eastern Arc Mountain Forests” (CMEAMF) Project (GEF-UNDP URT/01/32) has its roots in the 1997 International Conference on the Eastern Arc Mountains, organised by TAFORI in Morogoro.

Following the recommendations from that conference the Forest and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (MNRT) initiated the process of developing a full project proposal for the GEF. The GEF project is for \$12 million and contains two major elements: one developed through the World Bank for an endowment trust fund and the second developed through the UNDP to assist FBD in its work to improve conservation in the Eastern Arc Mountains.

The Eastern Arc Mountains Conservation Endowment Fund (EAMCEF) contains \$7 million World Bank GEF funds. It also has \$2 million from World Bank IDA funds that will run the establishment of the secretariat for the first 5 years.

The UNDP GEF project support through FBD contains the development of a holistic conservation strategy for the Eastern Arc (\$2.14 million), and a site-based project in the Uluguru Mountains (\$2.86 million).

Both the World Bank GEF and the UNDP GEF project elements are based in the same office complex in Morogoro.

The GEF support has been fully integrated into the Tanzania Forest Conservation and Management Project (TFCMP), which is the primary financial mechanism that has been mobilized to implement the National Forest Program (NFP). TFCMP is a \$50.1 million initiative (which includes US\$ 31.1 million in IDA financing) and it supports: the processes of institutional reform for the FBD; community-based forest and woodland protection and management; improved forest governance; and increased involvement of the private sector in the management of industrial plantations. Other donors include DANIDA, FINNIDA, and GTZ.

CMEAMF has adopted a partnership approach with all Eastern Arc stakeholders to facilitate the development and implementation of the strategy. Strong partnerships are already developed with the Catchment Forestry Programme and Monitoring and Evaluation Unit of FBD, with the Eastern Arc Mountains Conservation Endowment Fund, with the Critical Ecosystem Partnership Fund (www.cepf.web) and with environmental NGOs and projects operating in the area.

Conservation and Management of the Eastern Arc Mountain Forests (CMEAMF)

The CMEAMF project aims to improve the prospects for long term sustainable conservation of the globally important forests of the Eastern Arc. It is coordinated by the Government of Tanzania Forest and Beekeeping Division in the Ministry of Natural Resources and Tourism, with technical inputs from two NGOs - CARE and Tanzania Forest Conservation Group. The project will run for 5 years (2004-2008) and is part of a larger funding programme to assist FBD with the better management of its forest resources. CMEAMF is funded by the Global Environment Facility through UNDP.