

SUB-CATCHMENT MANAGEMENT **PLAN (SCMP)**

Version: 1

NAME OF WRUA: UPPER TURASHA KINJA

REGION: RIFT VALLEY

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TABLE OF CONTENTS

1 INTRODUCTION	1
1.1 Overview of SCMP Development	1
2 OVERVIEW OF SUB-CATCHMENT.....	1
3 WATER RESOURCE PROBLEMS.....	2
4 MANAGEMENT APPROACH.....	8
5 WATER BALANCE.....	9
5.1 Current Status	9
5.2 Targets	9
5.3 Proposed Outputs	9
5.4 Proposed Activities	9
6 WATER ALLOCATION.....	10
6.1 Current Status	10
6.2 Targets	10
6.3 Proposed Outputs	10
6.4 Proposed Activities	10
7 RESOURCE PROTECTION	11
7.1 Current Status	11
7.2 Targets	12
7.3 Proposed Outputs	12
7.4 Proposed Activities	12
8 CATCHMENT PROTECTION	13
8.1 Current Status	13
8.2 Targets	13
8.3 Proposed Outputs	13
8.4 Proposed Activities	14
9 INSTITUTIONAL DEVELOPMENT	16
9.1 Current Status	16
9.2 Targets	17
9.3 Proposed Outputs	17
9.4 Proposed Activities	17
10 INFRASTRUCTURE DEVELOPMENT.....	19
10.1 Current Status	19
10.2 Targets	19
10.3 Proposed Outputs	19
10.4 Proposed Activities	19
11 RIGHTS BASED APPROACH / POVERTY REDUCTION.....	21
11.1 Current Status	21
11.2 Targets	21
11.3 Proposed Outputs	21
11.4 Proposed Activities	21
12 MONITORING AND INFORMATION	22
12.1 Current Status	22
12.2 Targets	22

12.3 Proposed Outputs	Error! Bookmark not defined.
12.4 Proposed Activities	Error! Bookmark not defined.
13 FINANCING AND IMPLEMENTATION	23
13.1 Current Status	23
13.2 Targets	24
13.3 Proposed Outputs	24
13.4 Proposed Activities	24

APPENDICES

- Appendix A Maps
- Appendix B Work Plan and Budget

1 INTRODUCTION

1.1 Overview of SCMP Development

Upper Turasha-Kinja SCMP was developed in April 2008. This was developed by use of participatory focused group discussions with the help of WRMA staff, WWF staff, WRUA members and other relevant stakeholders in the sub catchment.

2 OVERVIEW OF SUB-CATCHMENT

General description of sub-catchment including:

- **Hydrology**

Upper Turasha Kinja is one of upper catchments of the Lake Naivasha basin. The sub catchment borders the Aberdare National Park on the East, Mukungi/Kitiri WRUA to the north, Tana catchment and Lower Malewa to the south east and west respectively

There are two major tributaries in the sub catchment i.e. Turasha and Kinja which mainly drain other small streams and springs originating from the Aberdares. It has an average annual rainfall of 1500mm and an average altitude of 2600m a.s.l.

- **Land use**

The main land use activities in the area are livestock and crop farming, agroforestry and urban settlements. The main crops are vegetables and potatoes grown both for subsistence and commercial purposes.

Poor farming practices especially on the riparian land and sloppy areas, charcoal burning and logging for posts has contributed to the depletion of the land cover and water resource in the sub catchment. Continuous land sub division occasioned by population increase is putting great pressure on the water resources and land ownership remains affordable to only able members of the community.

- **Population**

The area is composed of various settlement schemes which took place in 1963. The area covers six sub locations within Engineer, North Kinangop and Njabini locations of Nyandarua South district.

The population is as tabulated below:

No.	SUBLOCATION	AREA Km ²	DENSITY	POPULATION
1	Kinja	40.20	197.46	9,455
2	Gathaara	64.47	141.05	10,821
3	Tulaga	19.37	108.49	2,501
4	Muruaki	22.98	247.02	6,755
5	Kahuru	95.39	158.01	17,936
6	Murungaru	72.62	159.72	13,803

- **Economic activities**

The area is highly agricultural potential area. The main source of income is dairy farming. They also grow vegetables and potatoes which are highly perishable. Floriculture and horticulture has started been practiced too. This affects the prices of the commodities and the communities have no control of the prices.

3 WATER RESOURCE PROBLEMS

What are the main water resource problems?

PROBLEMS (ISSUES)

1. Water shortage
2. Draught
3. Deforestation
4. Soil erosion
5. River bank cultivation
6. Overgrazing
7. Slope cultivation
8. Poor farm management
9. Ignorance
10. Pollution by agrichemicals
11. Lack of Ownership
12. Encroachment
13. Over abstraction(Legal and illegal)
14. Storm Water Pollution
15. Lack of Law Enforcement
16. Water resource use conflicts
17. Poor sanitation
18. Conflicting Acts
19. Washing, Bathing, and washing farm produce in the rivers
20. Fishing activities/Intake interference
21. Lack of storage facilities
22. Lack of managerial skills
23. Siltation of rivers, Dams and Pans
24. Inaccessibility to the water resources
25. lack of security of the Intakes/forests/Dams

The issues brought out were then clustered into groups and the following major problems were identified

1. Inadequate water resources
2. Catchment degradation
3. Water pollution
4. Undemarcated riparian lands

Problems, Causes and Effects

After grouping the specific problems identified, possible causes and effects were clustered from the list of the issues listed above.

Item	Problem	Cause	Effect
1	Inadequate water resources	Draught Over abstraction Siltation Lack of water storage facilities Interference of intakes	Water use conflicts
2	Catchment degradation	Deforestation Overgrazing Poor farm management Watershed Encroachment Poor law enforcement mechanisms Lack of skill and knowledge	Soil erosion Siltation of the storage facilities Pollution of water sources Flooding
3	Water pollution	Agrochemicals inappropriately used Bathing, Washing and cleaning of farm products in water sources Storm water Poor urban sanitation Direct animal watering in water sources	Water borne diseases
4	Undemarcated riparian lands	Conflicting acts of various government departments Disregarding of laws	Water use/Land use disputes Degradation of riparian land Lack of access to water sources, grabbing of wetlands

Problem Ranking (Pair Wise)

The major problems were ranked to establish the problems that are more pressing and which should be given priority if they are to be implemented. By applying the pair wise tool the participants were lead through the process of comparing and contrasting and ultimately picking on the problems preferred to be of paramount importance.

The frequency of the problems was counted and indicated in the score column and the ranking determined by the recurrence of the problem i.e. the more the times the higher the rank

	Inadequate water (IW)	Catchment degradation (CD)	Water pollution (WP)	Un demarcated Riparian land(RL)	Score	Rank
Inadequate water (IW)		CD	IW	IW	2	2
Catchment degradation (CD)			CD	CD	3	1
Water pollution(WP)				WP	1	3
Un demarcated Riparian land(RL)					0	4

Who is affected by these problems and how?

Problem	Who is affected	How
Inadequate water (IW)	Community, Water Service Providers, Flower farmers around L. Naivasha, ranchers in the middle catchment, environment	Community, service providers and ranchers do not get enough water for domestic use Flower farmers and other irrigators do not enough water for irrigation Volume of water in L. Naivasha and feeding rivers has reduced hence affecting the ecosystem e.g. disappearance of papyrus and other plants around the lake
Catchment degradation (CD)	Community, Water Service Providers, Flower farmers around L. Naivasha, ranchers in the middle catchment, environment	Sources of water for communities, service providers and ranchers are threatened to dry up due to reduced flows Water levels and volume in the lake have reduced due siltation Climatic changes and flush floods are experienced in the catchment
Water pollution(WP)	Community, Water Service Providers,	Increased water borne diseases, disappearance of indigenous species of flora and fauna
Un demarcated Riparian land(RL)	Water bodies Community	Siltation and pollution of the water bodies Reduction of water levels/flows due to planting of Eucalyptus along the water bodies Grabbing of communal water points

STAKEHOLDERS IDENTIFIED AND ANALYSIS

Stakeholder analysis aims at establishing and analyzing the stakeholders in the plenary using focused group discussions.

The following stakeholders were identified:

1. Kenya Forest Service (KFS)
2. Water Resources Management Authority (WRMA)

3. Kenya Wildlife Services (KWS)
4. Caritas Nyeri
5. Rift Valley Water Services Board (RVWSB)
6. World Wide Fund for Nature (WWF)
7. Ministry of Agriculture (MoA)
8. Provincial Administration (PA)
9. National Environment Management Authority (NEMA)
10. Ministry of Lands
11. Water Resources Users Association (WRUA)
12. Local Authorities (LA)
13. Learning Institutions (Inst.)
14. Social Services (SS)
15. Community Forest Association (CFA)
16. Power generating companies(KenGen)

STAKEHOLDER ANALYSIS

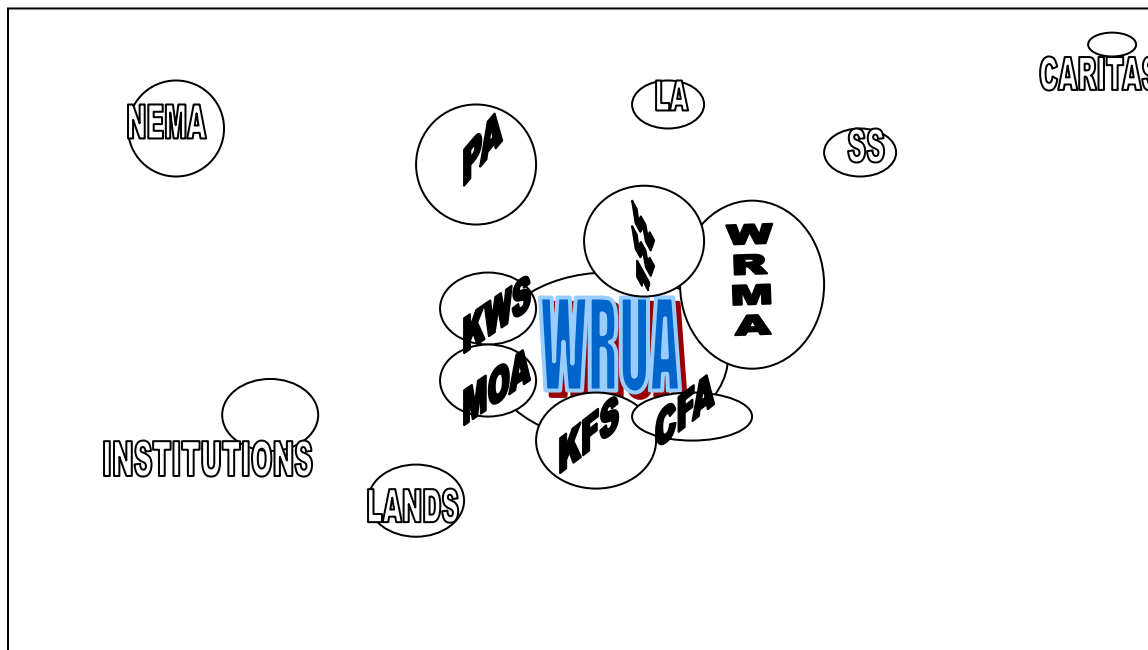
STAKEHOLDER	ROLE	ISSUES
WRUA	Water resource management Conflict resolution	
KFS	Forest rehabilitation, protection and conservation Re-forestation	Part of Mutarakwa forest left outside the Aberdares fence hence posing a danger to future destruction of major water sources
MoA	Pegging of Riverine Promotion of proper land use practices	Riparian land pegging
WRMA	Lead agency in water resource management <ul style="list-style-type: none"> • Capacity building of WRUA • Law enforcement 	Link collaboration between CFA and WRUA
KWS	Protection of wildlife and biodiversity	<ul style="list-style-type: none"> • Relocation of Aberdares fence to cover the left out portion of Mutarakwa forest • Provision of gates to access intakes and traditional shrines
RVWSB	<ul style="list-style-type: none"> • Licensing of Water Service Providers • Monitoring of WSP • Design and supervision of water structures 	<ul style="list-style-type: none"> • Delay in registration of Njabini Ngwataniro and Tulaga Ngwataniro Water Project as Water Service Provider • Interference of community project management by Nyandarua North Water company • Insufficient and discrimination of funding

Caritas Nyeri	<ul style="list-style-type: none"> • Monitoring of Catholic funded community water projects • Capacity building of water project management committees 	Tulaga Ngwataniro constructed on a seasonal stream hence does not provide water
WWF	<ul style="list-style-type: none"> • Capacity building on environmental conservation. • Project promotion • PES project 	Lack of proper coordination Lack of community/WRUAs in the project area identification and formulation
Prov.Admin	<ul style="list-style-type: none"> • Assist in solving of water use conflicts • Provide Security • Community mobilisation 	
NEMA	<ul style="list-style-type: none"> • Environmental protection • Vetting of EIAs 	
Lands	Demarcation of boundaries	Harmonization of land act to conform with the other acts on riparian demarcation
Local Authorities	<ul style="list-style-type: none"> • Avail land for water sanitation facilities • Solid waste disposal to avoid pollution • Proper urban planning 	<ul style="list-style-type: none"> • Pollution control facilities • No sewerage development plan • Solid waste dumped in the river
Institutions (Health Institutions and Schools)	Capacity building on water quality and environmental conservation	Should have enough water storage facilities Introduction of environmental. issues in the curriculum
Social Services	Registration of water projects Capacity building on management of community projects	Should be fully involved with groups after registration (Follow up of the groups)
CFA	Link between the community and KFS on matters of : <ul style="list-style-type: none"> • Catchment protection and conservation • Tree planting both in and out of gazetted forests 	Should help in solving the Mutarakwa forest boundary with KFS and KWS Link CFA with WRUA for them for work together

The Venn diagram (Chapatti) shows the key institutions and individuals in the community and their relationships and importance in decision making process. Taking into consideration the popularity and influence of the stakeholder over the resource issues, the each stakeholder was allocated a chapatti as shown in the diagram below:

Relationship Far
 Close
 Overlap

Influence Large
 Medium
 Small



What is the strategy to solve these problems?

SOLUTIONS

Out of the problems and causes identified, possible solutions or interventions were discussed as listed below

PROBLEMS	CAUSES	POSSIBLE SOLUTIONS
Inadequate water	Draught	Tree planting, Protection and conservation of existing ones
	Over abstraction	Enforcement of the law e.g. Installation of measuring devices Common intake construction
	Siltation	Soil conservation measures up hill and down hill Desilting of the existing
	Lack of storage facilities	Awareness creation on rainwater harvesting e.g. roof catchment, Pans, water holes, dams
	Intake interference	Fencing of the intake
Catchment degradation	Deforestation	Afforestation
	Overgrazing	Discourage grazing in the catchment area Controlled grazing Set grazing areas, seasons

		Maintain carrying capacity
	Lack of protection catchment Vegetation	Fencing of the catchment area
	Human encroachment	Restrict activities which negatively affect the catchment e.g. Logging, grazing,
	Cultivating along river banks and slopes	Create awareness on riparian conservation Pegging of riparian land Plant water friendly trees, natural vegetation,
	Poor law enforcement	Sensitization on legal requirement and benefits Continuous liaison with relevant departments on law enforcement

4 MANAGEMENT APPROACH

Key Themes:

- Management Unit
- Upper Turasha/Kinja is in Lake Naivasha basin in the upper catchment in 2GC management unit
- Classification
- The water in the catchment is mainly used for ecological and livelihood support
- Status of WRUA
 - **When was WRUA formed**
 - Upper Turasha/Kinja was formed in the year 2006
 -
 - **By whom?**
 - It was formed by all water users along Turasha and Kinja rivers sub catchments in collaboration with WRMA, PA, WWF, and LNGG
 -
 - **Why?**
 - The WRUA was formed as a forum for conflict resolution and cooperative management of water resources
 -
 - **What is WRUA registration status?**
 - It was registered under the societies act on 12th March, 2008
 -
 - **What is the boundary of the WRUA area?**

Upper Turasha Kinja is one of the sub catchments in Lake Naivasha in the Upper catchment of the basin. The sub catchment borders the Aberdare National Park on the north, Mukungi/Kitiri WRUA, Tana catchment, Lower Malewa to the west, east and south respectively

○

Resource map for the sub catchment is found in appendix A

5 WATER BALANCE

Key Themes:

- Assessment of water resource potential
- Assessment of Reserve
- Assessment of Water Demand
- Assessment of water balance

5.1 Current Status

Abstraction survey of all the abstractors in the sub catchment has been undertaken which gives us the water demand

5.2 Targets

To assess, the water resources potential, reserve and balance

5.3 Proposed Outputs

- Water resources potential
- Reserve
- Demand
- Balance

5.4 Proposed Activities

Gauging of rivers Turasha and Kinja

Computation of the potential, demand, reserve and the balance

Water Balance			
Target	To assess, the water resources potential, reserve and balance		
Output	Water resources balance and reserve maintained		
Activity	Sub-Activity	Timeframe	Budget
Assess the water resources potential	Identification of gauging points along Turasha and Kinja rivers & their tributaries	5 days	Fuel –30ltrs/d*5*110 = 16500 Lunches – WRUA 2*300*5 = 3000 Total - 19500
	Gauging of Turasha and Kinja rivers	12 days per yr	Fuel –50ltrs/d*1*110= 5500*12= 66000 Lunches – WRUA 1*300 = 300*12 = 3600 Total - 69600
	Computation of demand, reserve and balance	12months	Stationeries =3000

6 WATER ALLOCATION

Key Themes:

- Current abstraction
- Compliance with permits
- Development of Water Allocation Plan
- Improvements to Water use efficiency

6.1 Current Status

Abstraction survey of all the abstractors in the sub catchment has been undertaken which does not give us the current abstraction as all water abstractors have not fitted measuring devices.

Some of the abstractors are permitted but none is compliant because they have not installed measuring devices.

No allocation plan is in place

Water use efficiency cannot be determined since all consumers are not metered

6.2 Targets

To develop a water allocation Plan

6.3 Proposed Outputs

Water allocation plan

6.4 Proposed Activities

Verification/determination of the actual abstraction

Enforcement of compliance to permit conditions

Development of a water allocation plan

Capacity building of community/PMC on water use efficiency

Water Balance			
Target	Development of a Water allocation plan		
Output	Water allocation plan		
Activity	Sub-Activity	Timeframe	Budget
Verification/determination of the actual abstraction	Measurement of actual water abstracted e.g. volumetric, flow meter	5 days	Fuel – 30ltrs/d*5*110 = 16500 DSA – WRUA 2*300*5 = 3000 Total=19500
Enforcement of compliance to permit conditions	Issue of WRMA orders, disconnections, prosecutions,	Quarterly	Lump sum = 60000
Development of a water allocation plan	Hire a consultant	-	Lump sum 1,000,000
Capacity building of community/PMC on water use efficiency	8 public Barazas	8days	Fuel –30ltrs/d *8*110= 26400 DSA – WRUA 5*300*8 = 12000 PA 1*8*450=3600 Total =42000

7 RESOURCE PROTECTION

Key Themes:

- Protection of Reserve - Quantity
- Protection of Reserve – Quality
- Pollution Surveys
- Environmental Impact Assessments
- Pollution & effluent control
- Catchment and groundwater protection areas

7.1 Current Status

No activities are being undertaken currently on protection of the reserve both quality and quantity.

Pollution surveys are yet to be done comprehensively

Every homestead is required to have a pit latrine and solid waste disposal pit otherwise no business permit is issued by the public health department for business and plot owners in urban areas.

No EIA was undertaken when most of the projects were initiated but all new projects are supposed to submit an EIA before implementation

Aberdare National Park has been fenced off and gazetted by KWS as a protected area though a part of Mutarakwa forest has been left out which is an important catchment area

7.2 Targets

Protection of the reserve quantity and quality in Turasha, Kinja and tributaries

7.3 Proposed Outputs

Protected reserve quantity and quality

Pollution survey reports and effluent control plans

EIA reports

Gazetted catchments and ground water conservation areas

7.4 Proposed Activities

Resource protection			
Target	To have a well protected reserve quantity and quality		
Output	Protected reserve quantity and quality Pollution survey reports and effluent control plans EIA reports Gazetted catchments and ground water conservation areas		
Activity	Sub-Activity	Timeframe	Budget
Protect reserve quantity	River flow gauging for analysis of Q95	1day*12Months	Covered in chapter 5 (water balance)
	Review of existing data (Turasha 2GC7)	2days	2lunches *450 =900
	Computation of existing data	2days	2lunches *450 =900
	Preparation of flow duration curves	2days	2lunches *450 =900
	Installation of traffic light system gauges/signboards along the rivers and at a significant public place	6No gauges 1No Sign post Painting and panel beating of the gauges 5days	No cost 10,000 Painting 5000 Fuel – 50ltrs/d*1*110 = 5500 Lunches – WRUA 5*300*5 = 7500 Total = 30700
Protect reserve quality	Enforce Maintenance of the reserve quantity	Quarterly	Fuel – 50ltrs/d*1*110 = 5500*4= 22000 Lunches – WRUA 1*300 = 300*4 1200 Total - 23200
Establish the current WQ status	Identified points Identify the hotspots in the sub catchment Carry out sampling and analysis at Carry out a pollution	2days	Fuel – 50ltrs/d*1*110 = 5500 Lunches – WRUA 5*300*2 = 3000 Total = 8500

	survey Map/Locate/ identify point & non point sources of pollution		
Preparation EIA	Capacity Building 8 barazas		Covered in chapter 6 (water balance)
Gazetted catchments and ground water conservation areas	Lobbying for fencing of the left out part of Mutarakwa forest	6No meetings	Transport l/sum1000 DSA WRUA 25000 Total = 26000

8 CATCHMENT PROTECTION

Key Themes:

- Surveys & conservation of Riparian areas
- Erosion/sediment surveys
- Soil and water conservation plans
- Catchment rehabilitation

8.1 Current Status

Surveys and conservation of Riparian areas undertaken in Tulaga area and about 50,000no tree seedlings planted as catchment rehabilitation measure

8.2 Targets

Marking of riparian land 48 Kms

Plant 2.5m tree seedlings

8.3 Proposed Outputs

Controlled soil erosion

Increased water flow

Controlled evaporation rate

8.4 Proposed Activities

Catchment Rehabilitation

Afforestation

Pegging of riparian land

Catchment Protection			
Target	Plant 2.5m tree seedlings		
Output	Controlled soil erosion Increased water flow Controlled evaporation rate		
Activity	Sub-Activity	Timeframe	Budget (KShs.)
<i>Catchment Rehabilitation</i>	<ul style="list-style-type: none"> Identify areas 	5 days	Fuel –50ltrs/d*5*110 = 27500 Lunches – WRUA/CFA 3*300*5 = 3000 Lunches= Forester/Agric 2*500*5 = 5000 Total - 35500
	<ul style="list-style-type: none"> Mobilization/Sensitization of community (8 barazas) 	8 days	Fuel=30ltrs/d*8*110= 26400 Lunches = WRUA/CFA 5@300*8dys = 12000 PA=1*8*450=3600 Total = 38400
<i>Afforestation</i>	<ul style="list-style-type: none"> Pitting 	5 years	2.5 Million holes @ 5/- = 7.5 million
	<ul style="list-style-type: none"> Purchase of tree seedlings 	5 years	2.5 million seedlings @ 15/- = 37.5 million
	<ul style="list-style-type: none"> Transport 	5 years	350000 (lump sum) i.e. 35000/trip, 2 trips/year
	<ul style="list-style-type: none"> Planting of the seedlings 	5 years	2.5 million seedling @ 2/- = 5.0 million
	<ul style="list-style-type: none"> Spot weeding 	5 years	2.5 million seedling @ 2/- = 5.0 million
	<ul style="list-style-type: none"> Monitoring and follow up 	5 years	20000/- per season * 10 seasons=200,000 Total =55.55million
<i>Pegging of Riparian lands</i>	<ul style="list-style-type: none"> Identify areas 		See catchment rehabilitation (identify areas)
	<ul style="list-style-type: none"> Sensitization of all actors to avoid conflicting acts 	1 day	Lunch = 15 persons @ 500/- = 7500 Transport = 5 persons @ 200/- = 1000 Fuel: =

			Fuel=30ltrs/d*1*110=3300 Venue: = 1500 Total = 13300
	<ul style="list-style-type: none"> • Pegging Kinja and Turasha rivers (12km per river) 	2 months	Lunches = 10 people @ 500 for 60 days= 300000 Agric, Lands, WRUA, PA Total =300000
	<ul style="list-style-type: none"> • Planting of live fence to mark riparian boundary 		See afforestation budget
	<ul style="list-style-type: none"> • Planting of water friendly vegetation on the riparian land 		Covered under afforestation
	<ul style="list-style-type: none"> • Marking of eroded areas 	2 days	Lunches – WRUA/PA 3*300*2 = 1200 Lunches - Agric 1*500*2 = 1000 Total =2200
	<ul style="list-style-type: none"> • Restoration of eroded areas 	2 months	500000/- lump sum
	<ul style="list-style-type: none"> • Follow up of above issues 	5 years	Covered under monitoring and follow-up under afforestation Total 815 500

9 INSTITUTIONAL DEVELOPMENT

Key Themes:

- WRUA Capacity Building
 - Mobilization
 - Membership sensitization
 - Communication
 - Human Resource Development
 - Facilities
- Stakeholder Coordination Activities
 - Roles and responsibilities

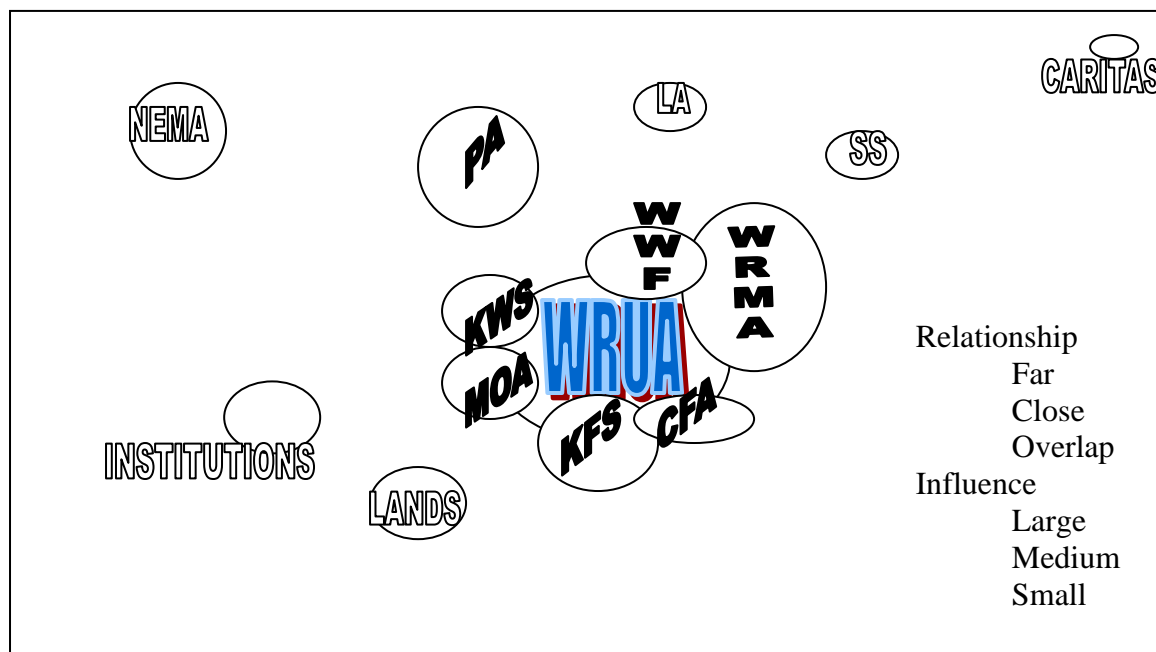
9.1 Current Status

- WRUA Capacity Building

Membership mobilization and sensitization undertaken during the formation stage
Capacity building has been done on water sector reforms; however there is need to conduct a Training Needs Assessment for the WRUA to undertake a comprehensive Capacity building Programme. The WRUA lacks facilities for office operations such as office block, computers, furniture, communication, etc.

- Stakeholder Coordination Activities

The WRUA is currently working in collaboration with partners such as WRMA, WWF, KFS, CFA, Agriculture, Provincial Administration e.t.c as illustrated in the diagram below



9.2 Targets

Conduct Training needs and implement them

9.3 Proposed Outputs

WRUA capacity building conducted

9.4 Proposed Activities

Conduct TNA

Conduct Trainings

Institutional Development			
Target	Conduct Training needs and implement them		
Output	WRUA capacity building conducted		
Activity	Sub-Activity	Timeframe	Budget (KShs.)
Conduct TNA	Develop assessment tool	2 days	Office stationery = 2000/-
	Distribution/collection of the TNA tool	1 week	Fuel=30ltrs/d*1*110= 3300 Transport WRUA= 2000 Lump sum Lunch WRUA= 4 dys@300=1200 Total = 8500
	Produce TNA report	1 week	Office stationery = 2000/-
Conduct Trainings	Prepare Training Plan	2 days	Office stationery = 2000/-
	Carry out training	3 days	Hall hire: 3dys@1500=4500 Fuel: 30ltrs/d*3*110= 9900 Meals: 30@500*3=45,000 Facilitators: 5@3500 *3= 52500

	Prepare Training Report	1 week	Office stationery = 2000/- Total = 113,900
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10 INFRASTRUCTURE DEVELOPMENT

Key Themes:

- Storage at different levels (household, farm, sub-catchment)
- Groundwater storage
- Flood mitigation

10.1 Current Status

There are no water harvesting facilities in the area and about 70% have piped water. There are a few dams in the area though encroached and highly silted up. No ground water storage has been identified however there are some few community and individual boreholes. The area is not prone to floods due to its topography

10.2 Targets

To increase water storage facilities

10.3 Proposed Outputs

Increased water storage

10.4 Proposed Activities

Rain water harvesting

Dam desiltation

Reclamation of encroached areas

Construction of dams/pans

Rehabilitation and equipping of existing boreholes

Construction of common intakes

Infrastructure Development			
Target	To increase water storage facilities		
Output	Increased water storage		
Activity	Sub-Activity	Timeframe	Budget (KShs.)
Rain water harvesting	Demonstration on water harvesting technologies	1 month	Tank: 30,000 Guttering materials: 10,000 Transport: 10000 Labor: 12500 (community) Total = 62500
Dam desiltation	Identify the dams	2 days	Lunch WRUA: 3@300*2= 1800 WSB: 2@500*2= 2000 Total = 3800
	Survey of dams	20 days	Fuel: 30Lts@110*20=66000 Lunch: 3 @500*20=30,000 Total 96000
	Float quotation	2 days	Postage: 5@200= 1000
	Desiltation	40 months	10 dams @ 5,000,000=50,000,000

			Total = 50.1008Million
Reclaiming of encroached dam land	establish status/boundary/ownership of dam	10 days	Lunch WRUA: 3@300*10= 9000
	Verification of titles from relevant offices (lands and settlement)	10 days	Lunch WRUA: 3@300*10= 9000 Search fee: 10@100=1000 Total= 10000
	Processing of legal documents(gazettment)	6 months	10 dams @5000 = 50,000
	Fencing		10 dams @ 20,000 = 200000 Total 269000
Construction of dams/pans	Feasibility study	2 days	Fuel: 30Lts@110*2=6,600 Lunch: 3 @500*2= 3,000
	Survey of the area	10 days	10 days@3500*3 = 105,000 10@200*5 = 10,000 (community)
	Carry out design	2 month	Stationary=50,000 (lump sum)
	Conduct EIA	10 days	100,000 lump sum
	Tendering	2 days	Postage: 2000
	Construction of dams/pans	2 months	2 dams @ 10,000,000 = 20,000,000 Total = 20.277million
Rehabilitation and equipping of existing boreholes	Borehole inventory and information collection	1 month	2@300*10 days = 6000 1@ 2500*10 days = 25,000
	Mobilization for rehabilitation work	5 years	10 Bhs @ 2.5million=25million Total = 25.031 million
Construction of common Intakes	Site identification	2 weeks	Fuel and lunches – L/sum 10,000
	Mobilization of the water projects to have a consensus	2 months	Fuel costs-L/sum 20,000 Lunches -10@500*2=10000
	Surveying and designing of intake works	6 Months	Technical experts L/sum =100,000 WrUA lunches 1@20 days*300=6000
	Construction of 2No common intakes and distribution mains	1 year	12 Million Total =12.146milliom

11 RIGHTS BASED APPROACH / POVERTY REDUCTION

Key Themes:

- Threats to water rights
- Conflict issues
- Gender issues
- Environment issues
- Sustainable livelihoods

11.1 Current Status

In the area everybody has a right to access water. Conflict on ownership of water projects and equitable allocation of water are experienced in the area. Women are responsible in searching and usage of water but they are not in management of projects. Youths are never available in water matters and they need to be encouraged to take initiative.

There are several point source pollution aspects denying the downstream users the right to use quality water. Deforestation at the Aberdare forest in preparation of fencing encouraged siltation polluting the water.

The area has enough rainfall and the farmers practice dairy and subsistence farming sustaining their livelihoods. A few farmers practice irrigation during dry seasons. Bee keeping, growing trees for commercial purposes are also issues sustaining livelihood and reducing poverty level and in doing this awareness on HIV/Aids is necessary.

11.2 Targets

Everybody to have access to quality water equitably (gender in consideration)

11.3 Proposed Outputs

Healthy community

11.4 Proposed Activities

Awareness creation

Encourage good farming methods

Enforce mitigation measures on effluent discharging

Right Based Approach/Poverty Reduction			
Target	Everybody to have access to quality water equitably (gender in consideration)		
Output	Healthy community		
Activity	Sub-Activity	Timeframe	Budget (KShs.)
Awareness creation	8 barazas	8 days	Fuel=30ltrs/d*8*110= 26400 Lunches = WRUA 5@300*8dys = 12000 PA=1*8*450=3600

			Total 42 000
Encourage good farming methods	Demonstrations/field visits	8days	Fuel=30ltrs/d*8*110= 26400 Lunches = WRUA 5@300*8dys = 12000 PA=1*8*450=3600 Agriculture =8* 500=4000 Total 46000
Enforce mitigation measures on effluent discharging	Sensitization of the community	8days	Covered above
	Identifying defaulters	2days	Fuel=30ltrs/d*2*110= 6600 Lunches = WRUA 5@300*2days = 3000 PA=1*2*450=900 Public Health. =2* 500=1000 Total 11500
	Issue warnings to non compliant		Fuel=30ltrs/d*2*110= 6600 Lunches = WRUA 5@300*2days = 3000 PA=1*2*450=900 Public Health. =2* 500=1000 Total = 11500
	Sue the offenders		Court expenses 100,000 (lump sum)

12 MONITORING AND INFORMATION

Key Themes:

- Water resource monitoring
- Water quality monitoring
- Water use monitoring
- Pollution monitoring
- Information sharing arrangements

12.1 Current Status

There is 2 No gauging station (2GC7 and 2GC 5) in the sub catchment which is being monitored and has some data. However it doesn't give the representation of the whole catchment for it is on Turasha River and on the upper part of the sub catchment. There are 5 No of rainfall stations. The annual average rainfall of the area is about 1500mm.

Water quality monitoring has been initiated and samples collected upstream and downstream of the polluter.

12.2 Targets

Proper water resource monitoring by the WRUA/WRMA

12.3 Proposed Outputs

Quality and quantity of water determined

12.4 Proposed Activities

Monitoring of quantity, quality and water use

Monitoring and Information			
Target	Proper water resource monitoring by the WRUA/WRMA		
Output	Quality and quantity of water determined		
Activity	Sub-Activity	Timeframe	Budget (KShs.)
Monitoring of quantity, quality and water use	Site identification	5days	Fuel=40ltrs/d*5*110= 22000 Lunches = WRUA 5@300*5dys = 7500 Total 29500
	Sampling	2days/quarter	Fuel=40ltrs/d*2*110 *4= 32200 Lunches = WRUA 3@300*2dys*4 = 7200 Laboratory Fee=36000*4=144000 Total=183400
	Gauging	2days	Covered in chapter 5 (water balance)
	Determination of the actual water use	10days (quarterly)	Fuel=40ltrs/d*10*110 *4= 176000 Lunches = WRUA 3@300*10dys*4= 36000 Total=212000
	Creation of a water resource monitoring data base	1 week	Stationery 1000 lump sum Computer 45,000 Lunches 5*5*300 = 7500 Total = 53500
	Sharing the information	Quarterly	Transport= 8000 lump sum Lunches= 12000 lump sum Stationary=4000 lump sum Total= 24000

13 FINANCING AND IMPLEMENTATION

Key Themes:

- WRUA operational budget
- Mechanisms to meet WRUA operational budget
- SCMP investment budget
- Mechanisms to raise SCMP investment budget

13.1 Current Status

WRUA operational budget

The WRUA has a savings Bank account with Equity bank at Engineer. Sources of income for the WRUA are:

Contributions from the Members.

There are a total of 15 member projects and all are active currently

Mechanisms to meet WRUA operational budget

The WRUA expenses are higher than the income. Members offer voluntary services e.g. buying stationary, sitting allowance and transport.

- membership registration fee 2000/=
- monthly contribution 1000/= per member project
- Development partners contributions Nothing

SCMP investment budget

The SCMP investment budget has been prepared as per appendix B below

Mechanisms to raise SCMP investment budget

This is expected to be achieved through proposal to WSTF, GOK, CDF, development partners, well wishers and community contribution both in kind and material.

13.2 Targets

To Ensure WRUA is financially sustainable

13.3 Proposed Outputs

Financially sustainable WRUA

13.4 Proposed Activities

Capacity building on:

- Financial management
- Resource mobilization
- Project management

Financing and Implementation			
Target	To Ensure WRUA is financially sustainable		
Output	Financially sustainable WRUA		
Activity	Sub-Activity	Timeframe	Budget (KShs.)
Capacity building on:	<ul style="list-style-type: none"> • Financial management 	2 days	Fuel=40ltrs/d*2*110= 8800 Lunches = WRUA 15@300*2dys = 9000 Venue:1500*2=3000 Consultant fee =1@10000*2=20000 Total = 40800

	• Resource mobilization	1 day	Fuel = 40ltrs/d*1*110= 4400 Lunches = WRUA 15@300*1dys = 4500 Venue:1500*1=1500 Consultant fee =1@10000*1=10000 Total =20400
	• Project Proposal preparations	5 years(2 proposals per quarter)	10000*4*5*2= 400000
	• Project management	2 days	Fuel=40ltrs/d*2*110= 8800 Lunches = WRUA 15@300*2dys = 9000 Venue:@ 1500*2=3000 Consultant fee =1@10000*2=20000 Total =40800

APPENDIX A

MAPS



APPENDIX B WORKPLAN AND BUDGET

(Use Excel Worksheet)

SUB-CATCHMENT MANAGEMENT PLAN										TIMEFRAME (STARTING XX/YY)																					
WRUA:					FINANCING					YE AR		YEAR				YEAR															
C H	TOPIC	ACTIVITY	SET	BUDGET	WDC FUNDS	WRU A FUNDS	WRU A IN- KIN D	OTHERS FUNDS																							
									1	2	3	1	2	3	4	1	2	3	4	1	2	3	4								
3 Catchment Characteristics																															
	Target																														
	Output																														
	Activity																														
	1																														
	2																														
	3																														
4 Management																															
	Target																														
	Output																														
	Activity																														
	1																														
	2																														
	3																														

5 Water Balance																					
Target	To assess, the water resources potential, reserve and balance																				
Output	Water balance, reserve maintained																				
Activity	Assess the Water resources potential																				
1	Identification of gauging points along Turasha and Kinja rivers & their tributaries	1	19500	16575	0	2925	0														
2	Gauging of Turasha and Kinja rivers	2	69600	59160	0	2440	8000														
3	Computation of demand, reserve and balance	3	3000	2550	450	0	0														
6 Water Allocation																					
Target	Development of a Water allocation plan																				
Output	Water allocation plan																				
Activity	Verification/determination of the actual abstraction																				
	Measurement of actual water abstracted e.g. volumetric, flow meter		19500	16575	0	2925	0														
Activity	Enforcement of compliance to permit conditions																				
	Issue of WRMA orders, disconnections, prosecutions		60000	51000	0	9000	0														
Activity	Development of a water allocation plan																				
	Hire a consultant		1000000	850000	0	15000	0														
Activity	Capacity building of community/PMC on water use efficiency																				
	8 public Barazas		42000	35700	0	6300	0														
7 Resource Protection																					

Target	To have a well protected reserve quantity and quality																								
Output	Protected reserve quantity and quality Pollution survey reports and effluent control plans EIA reports Gazetted catchments and ground water conservation areas																								
Activity	Protect reserve quantity																								
	River flow gauging for analysis of Q95	1	0	0	0	0	0																		
	Review of existing data (Turasha 2GC7)	2	900	0	0	900	0																		
	Computation of existing data	2	900	900	0	0	0																		
	Preparation of flow duration curves	3	900	900	0	0	0																		
	Installation of traffic light system gauges/signboards along the rivers and at a significant public place	3	28000	23800			4200	0																	
Activity	Protect reserve quality																								
	Identified points Identify the hotspots in the sub catchment Carry out sampling and analysis at Carry out a pollution survey Map/Locate/ identify point & non point sources of pollution	1	8500	7225			3480	0																	
	Enforce Maintenance of the reserve quality	2	23200	19720	0		1275	0																	
Activity	Preparation EIA reports						3480	0																	
	Sensitization meetings 8 barazas	1	0	0																					

	Activity	Gazetted catchments and ground water conservation areas				0	0	0												
		Lobbying for fencing of the left out part of Mutarakwa forest	1	26000	22100															
8	Catchment Protection					0	3900	0												
	Target	Plant 2.5m tree seedlings																		
	Output	Controlled soil erosion Increased water flow Controlled evaporation rate																		
	Activity	<i>Catchment Rehabilitation</i>																		
		• Identify areas		35500	30175	0	5325	0												
		• Mobilization/Sensitization of community (8 barazas)		38400	32640	0	5760	0												
	Activity	<i>Afforestation</i>																		
		• Pitting		7500000	6375000	0	1125000	0												
		• Purchase of tree seedlings		37500000	31875000	0	5625000	0												
		• Transport		350000	297500	0	225875	0												
		• Planting of the seedlings		5000000	4250000		750000	0												
		• Spot weeding		5000000	4250000	0	750000	0												
		• Monitoring and follow up		55550000	47217500	0	4166250	4166250												
	Activity	<i>Pegging of Riparian lands</i>																		
		• Identify areas		0	0	0	0	0												
		• Sensitization of all actors to avoid conflicting acts		13300	11305	0	1995	0												
		• Pegging Kinja and Turasha rivers (12km per river)		300000	255000	0	45000	0												
		• Planting of live fence to mark riparian boundary		0	0	0	0	0												

		• Planting of water friendly vegetation on the riparian land	0	0	0	0	0												
		• Marking of eroded areas	2200	1870	0	330	0												
		• Restoration of eroded areas	500000	425000	0	75000	0												
		• Follow up of above issues	815500	693175	0	122325	0												
9	Institutional Development																		
	Target	Conduct Training needs and implement them																	
	Output	WRUA capacity building conducted																	
	Activity	Conduct TNA																	
		Develop assessment tool	2000	1700	0	300													
		Distribution/collection of the TNA tool	8500	4930	0	430													
		Produce TNA report	2000	1700	0	300													
	Activity	Conduct Trainings																	
		Prepare Training Plan	2000	1700	0	300													
		Carry out training	52500	44625	0	3570													
		Prepare Training Report	2000	1700	0	17085													
10	Water Infrastructure Development																		
	Target	To increase water storage facilities																	
	Output	Increased water storage																	
	Activity	Rain water harvesting																	
		Demonstration on water harvesting technologies	62500	53125	0	9375	0												
	Activity	Dam desiltation																	
		Identify the dams	3800	3230	0	570	0												
		Survey of dams	96000	81600	0	14400	0												
		Float quotation	1000	850	150	0	0												
		Desiltation	5000000	4250000	0	100000	6500000												
	Activity	Reclaiming of encroached dam land																	

	consideration)																			
Output	Healthy community																			
Activity	Awareness creation																			
	8 community barazas		42000	35700	0	6300	0													
Activity	Encourage good farming method																			
	Demonstrations/field visits		46000	39100	0	6900	0													
Activity	Enforce mitigation measures on effluent discharging																			
	Sensitization of the community		0	0	0	0	0													
	Identifying defaulters		11500	9775	0	1725	0													
	Issue warnings to non compliant		11500	9775	0	1725	0													
	Sue the offenders		100000	85000	0	15000	0													
1																				
2	Monitoring & Information																			
	Target																			
	Output																			
	Activity	Monitoring of quantity, quality and water use																		
		Site identification		29500	25075	0	4425													
		Sampling		183400	155890	0	2751	0												
		Gauging		0	0	0	0													
		Determination of the actual water use		212000	180200	0	3180	0												
		Creation of a water resource monitoring data base		53500	45475	0	8025													
		Sharing the information		24000	20400		3600													
	Financing & Implementation																			
1	Target	To Ensure WRUA is financially sustainable																		
3																				
	Output																			

Activity																								
1																								
			Financ																					
		2	ially																					
			sustain																					
			able																					
			WRUA																					
	3	Capacity building on:																						
	4	Financial management		40800	34680																			
		Resource mobilization		20400	17340	0	6120	0																
		Project Proposal preparations		400000	340000	0	3060	0																
		Project management		40800	34680	10000	0	50000																
		SUMMARY					0	6120	0															
		Total Budget Activity Set	1																					
		Total Budget Activity Set	2																					
		Total Budget Activity Set	3																					

