

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

**Version: 1**

**NAME OF WRUA: UPPER MALEWA  
REGION: RIFT VALLEY**

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## **APPENDICES**

Appendix A	Maps
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## 1 INTRODUCTION

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### 1.1 Overview of SCMP Development

Upper Malewa SCMP started being developed in August 2008. This has been through use of participatory focused group discussions and workshops with the help of WRMA staff, WWF staff, WRUA members and other relevant stakeholders in the Sub catchment.

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## 2 OVERVIEW OF SUB-CATCHMENT

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### General Description of Sub-Catchment

- **Hydrology**

Upper Malewa WRUA lies in the upper most catchment area of the Lake Naivasha basin. The sub catchment borders the Aberdare National Park on the East, Wanjohi Wrua to the South and, Ewaso Ngiro catchment to the North and Middle Malewa to the North West.

The Malewa is main river in the sub catchment and mainly drains other small streams and springs originating from the Aberdares range. It has an average annual rainfall of 1600mm and an average altitude of 2800m a.s.l.

- **Land use**

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

There are poor farming practices especially on the riparian land and sloppy areas, charcoal burning and logging for posts has contributed to the degradation and depletion of the water resources in the sub catchment. Continuous land sub division occasioned by population increase is putting great pressure on the water resources and land 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 one sub location Gatondo in Wanjohi location in Nyandarua South District.

The population is as tabulated below:

No.	SUBLOCATION	AREA Km <sup>2</sup>	DENSITY	POPULATION
1	Gatondo	49.42	71.52	4,206

- **Economic activities**

The Upper Malewa is a highly potential agricultural area. The main source of income is dairy farming. Vegetables, snow peas, onions, carrots and potatoes are grown though they are highly perishable. This affects the prices of the commodities and the communities have no control of the prices for there is no

reliable market. Poor road infrastructure contributes highly to the poor prices as this makes the would be buyers and investors shy away.

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### **3 WATER RESOURCE PROBLEMS**

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What are the main water resource problems?

#### **PROBLEMS (ISSUES)**

The following problems were identified:

1. Deforestation
2. overgrazing
3. water wastage
4. wild fire
5. inadequate water supply during draught
6. poor farming methods
7. lack of water storage
8. soil erosion
9. lack of common intake
10. lack of technical knowledge on management of water projects
11. water pollution
12. water conflicts
13. demarcation of riparian areas
14. river bank protection
15. undesirable trees
16. lack of employment among the youth
17. charcoal burning
18. poor drainage
19. poor infrastructure
20. ignorance on water resource management

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

1. Water scarcity
2. Water pollution
3. Water use conflicts
4. Undemarcated riparian lands boundaries

### 3.2 Problems, Causes and Effects

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

Item	Problem	Cause	Effect
1	Water Scarcity	<ul style="list-style-type: none"> <li>• Deforestation</li> <li>• Planting undesirable trees e.g. eucalyptus</li> <li>• Wild fires</li> <li>• Water wastage</li> <li>• Poor land use/practices along the slopes</li> <li>• Over abstraction</li> <li>• Population increase</li> <li>• Climatic changes</li> </ul>	<ul style="list-style-type: none"> <li>• Poverty/hunger</li> <li>• Drying of rivers</li> <li>• Disappearance of fish &amp; other aquatic life</li> <li>• Conflicts</li> </ul>
2	Water Pollution	<ul style="list-style-type: none"> <li>• Poor drainage</li> <li>• Poor farming methods</li> <li>• Poor/unmaintained storage facilities</li> <li>• Soil erosion</li> <li>• Washing of farm produce/vehicles in the river</li> <li>• Watering of livestock in the river</li> </ul>	<ul style="list-style-type: none"> <li>• Water borne diseases</li> <li>• Disappearance of fish &amp; other aquatic life</li> <li>• Soil infertility</li> </ul>
3	Water use conflicts	<ul style="list-style-type: none"> <li>• Improper water resource management</li> <li>• Greed over available water</li> <li>• Lack of employment</li> <li>• Population pressure</li> <li>• Lack of common intake/permanent intake</li> </ul>	<ul style="list-style-type: none"> <li>• Law enforcement</li> <li>• Court cases</li> <li>• Physical fight &amp; injuries</li> <li>• Destruction of infrastructure</li> <li>• enmity</li> </ul>
4	Undemarcated of riparian land boundaries	<ul style="list-style-type: none"> <li>• encroachment/grabbing of land</li> <li>• lack of clear policies on riparian land</li> <li>• logging along riparian lands</li> </ul>	<ul style="list-style-type: none"> <li>• deforestation</li> <li>• wild fires</li> <li>• erosion</li> <li>• insecurity of the resources</li> </ul>

### 3.2 Pair wise Ranking of Problems

The major problems were ranked to establish the problems that are more pressing and which should be given priority if they are to implement. By applying the pair wise tools 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

	Water Scarcity (WS)	Water Pollution (WP)	Water Conflict (WC)	Demarcation of riparian land (DR)	Score	Rank
Water Scarcity (WS)		WS	WS	DR	2	2
Water Pollution (WP)			WC	DR	0	4
Water Conflict (WC)				DR	1	3
Demarcation of riparian land (DR)					3	1

## SOLUTIONS

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

PROBLEMS	CAUSES	POSSIBLE SOLUTIONS
Water Scarcity	Deforestation	<ul style="list-style-type: none"> <li>• Tree planting (indigenous seedlings)</li> <li>• Establishment of tree nurseries</li> </ul>
	Planting Undesirable trees	<ul style="list-style-type: none"> <li>• Creation of awareness</li> <li>• Replacement of eucalyptus tree with water friendly trees</li> </ul>
	Wild Fires	<ul style="list-style-type: none"> <li>• Creation of awareness on dangers of wildlife</li> <li>• Law enforcement</li> <li>• Train honey gatherers on modern ways of honey harvesting</li> <li>• Encourage use of alternative energies e.g. biogas</li> </ul>
	Water Wastage	<ul style="list-style-type: none"> <li>• Creation of awareness on water conservation</li> <li>• Encourage construction of storage facilities and common intake</li> <li>• Install control devices</li> </ul>
	Poor land use practices along the slopes	<ul style="list-style-type: none"> <li>• Training farmers on contour farming</li> <li>• Terraces</li> <li>• Planting of Napier grass &amp; agro forestry</li> </ul>
	Over abstraction	<ul style="list-style-type: none"> <li>• Law enforcement</li> <li>• Construction of common intake</li> <li>• Metering devices on abstractions</li> </ul>

	Population increase	<ul style="list-style-type: none"> <li>• Awareness creation on family planning methods</li> </ul>
	Climatic Change	<ul style="list-style-type: none"> <li>• Planting trees</li> <li>• Promotion of alternative sources of energy</li> <li>• Increase storage facilities</li> </ul>
Water Pollution	Poor drainage	<ul style="list-style-type: none"> <li>• Creation of awareness</li> <li>• Construct check pans</li> <li>• Drainage galleys</li> </ul>
	Poor farming methods	<ul style="list-style-type: none"> <li>• Awareness creation on farm management</li> <li>• Organic farming</li> </ul>
	Poor/unmaintained storage facilities	<ul style="list-style-type: none"> <li>• Periodic cleaning</li> <li>• Repair &amp; maintenance of water tanks</li> <li>• Construction of modern storage facilities</li> </ul>
	Soil erosion	<ul style="list-style-type: none"> <li>• Terracing</li> <li>• Contour farming</li> <li>• Plant grass e.g. Napier</li> <li>• Agro forestry</li> </ul>
	Washing of vehicles/farm produce in the river	<ul style="list-style-type: none"> <li>• Create awareness</li> <li>• Stop washing</li> <li>• Law enforcement</li> </ul>
	Watering of livestock in the rivers	<ul style="list-style-type: none"> <li>• Construction of watering points</li> <li>• Law enforcement</li> </ul>
Water Conflicts	Improper water management	<ul style="list-style-type: none"> <li>• Awareness creation on water management</li> <li>• Employ qualified staff to manage water resources</li> <li>• Law enforcement/By laws</li> </ul>
	Greed over available water	<ul style="list-style-type: none"> <li>• Awareness creation</li> <li>• Law enforcement</li> <li>• Controlling devices</li> <li>• Rationing</li> </ul>
	Population pressure	<ul style="list-style-type: none"> <li>• Enhance rainwater harvesting at household level</li> <li>• Awareness creation on water management</li> <li>• Increase storage</li> <li>• rationing</li> </ul>
	Lack of employment	<ul style="list-style-type: none"> <li>• proper management of resource</li> </ul>
	Lack of common intake/permanent	<ul style="list-style-type: none"> <li>• construction of the intake</li> </ul>
Demarcation of riparian boundaries	Encroachment/grabbing of land	<ul style="list-style-type: none"> <li>• identify boundaries</li> <li>• reclaim all grabbed areas</li> <li>• law enforcement</li> <li>• plant trees (water friendly)</li> <li>• replace eucalyptus with water friendly trees (indigenous)</li> </ul>
	<ul style="list-style-type: none"> <li>• Lack of clear policies on riparian</li> </ul>	<ul style="list-style-type: none"> <li>• harmonization of different policies (convene stakeholders meetings)</li> </ul>



	land	
	<ul style="list-style-type: none"> <li>• Logging along riparian land</li> </ul>	<ul style="list-style-type: none"> <li>• Create awareness on danger of logging</li> <li>• Law enforcement</li> <li>• Encourage planting of tree in farms</li> </ul>

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## 4 MANAGEMENT APPROACH

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### Key Themes:

- Management Unit  
Upper Malewa Wrua is in the Lake Naivasha basin and covers part of the upper most part of the catchment in 2GB management unit
- Classification  
The water in the catchment is mainly used for ecological and livelihood support. However the community is being encouraged in future to use the water commercially e.g. for irrigation, fish farming and mineral water bottling.
- Status of the WRUA
  - **When was WRUA formed**
    - Upper Malewa WRUA was formed in the year 2006
  - **By whom?**
    - It was formed by all water users in the upper Malewa river sub catchment in collaboration with WRMA, Provincial Administration, Rural Focus (working for the Lake Naivasha Growers Group for the development of Water Allocation Plan) and other key stakeholders.
  - **Why?**
    - The WRUA was formed as a forum for conflict resolution and cooperative management of water resources within the area.
    - Water use conflicts are normally experienced. Several court cases are recorded where those involved have been fined up to Kshs 350,000 by the courts
  - **What is the WRUA registration status?**
    - It was registered under the Societies Act (Laws of Kenya) on 10<sup>th</sup> May, 2007
  - **What is the boundary of the WRUA area?**
    - The Wrua sub catchment borders the Aberdare National Park on the East, Wanjohi Wrua to the South and, Ewaso Ngiro catchment to the North and Middle Malewa to the North West.

For the Community Resource map and the WRUA boundary map of the sub catchment (Refer to Appendix A)

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## 5 WATER BALANCE

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Key Themes:

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

### 5.1 Current Status

The water resource potential in the area is mainly surface water. Due to high amount of rainfall received in the area, there is potential for rain water harvesting structures to ease the pressure on river water. Ground water potential has not been exploited for there is only one public borehole (Gatondo) in the area.

The reserve is not adequate because the river does not flow throughout the year. However during a dry spell it is threatened by the destruction of the catchment and over abstraction by WSPs because many of them have no measuring devices which encourage misuse of the resource.

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

### 5.2 Targets

To assess & promote exploitation of the water resources potential, water demand, balance and maintain the reserve

### 5.3 Proposed Outputs

- Water resources potential
- Demand
- Balance
- Reserve

### 5.4 Proposed Activities

Gauging of river Malewa

Computation of the potential, demand, balance and the reserve

Water Balance			
Target	To assess, the water resources potential, reserve and balance		
Output	Established water resource potential, reserve and balance		
Activity	Sub-Activity	Timeframe	Budget
Gauging of rivers Malewa at 2GB3 and other streams	Identification of gauging points along Upper Malewa river & its tributaries	2 days	Fuel: 20ltrs/d*2*110 = 4400 Lunches: WRUA 3*300*2 = 1800 Total: 6200
	Gauging at the identified points	2day*12Months	Fuel: 20ltrs/d*2*110*12=52800 Lunches: WRUA 3*300*2 *12 = 21600 Total: 74400

Computation of demand, reserve and balance	Computation of demand, reserve and balance	12months	Stationeries 2500 (lump sum)
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## 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 actual abstraction because none of the abstractors have fitted measuring devices.

A few of the abstractors are permitted though majorities have started the process to through the WRUA to have their permits issued. No water allocation plan is in place Water use efficiency cannot be determined since all consumers at household level are not metered

Due to over abstraction both by legal and illegal abstractors, many cases of water use conflicts have been occurring thus necessitating the establishment of a WRUA and the development of a SCMP.

### 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

<b>Water Balance</b>			
<b>Target</b>	To develop a water allocation Plan		
<b>Output</b>	Water allocation plan		
<b>Activity</b>	<b>Sub-Activity</b>	<b>Timeframe</b>	<b>Budget</b>
Verification/determination of the actual abstraction	Measurement of actual water abstracted e.g. volumetric, flow meter	6 days	Fuel: 20ltrs/d*6*110 = 13200 Lunches: WRUA 4*300*6 = 7200 Security: 2*500*6=6000 Equipments and stationery = 2000

			Total = 28 400
Enforcement of compliance to permit conditions	Issue of WRMA orders, disconnections, reconnections, prosecutions	Quarterly	Lump sum 20000 per qtr*4*5yrs=400000
Development of a water allocation plan	Hire a consultant	1.5 months	Lump sum 700,000
Capacity building of community/WSPs on water use efficiency	10 public Baraza meetings	10 days	Fuel: 20 ltrs/d*10*110= 22000 Lunches: WRUA 9*300*10 = 27000 PA 1*10*500=5000 Stationery = 1000 Total 55 000

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## 7 RESOURCE PROTECTION

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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

- **Protection of reserve – Quantity&quality**

Tree planting initiatives will be undertaken in the catchment and along the riparian land towards protection of the reserve quantity and quality. The WRUA has been sensitizing members on maintenance of natural vegetation along the river-rine riparian lands and water sources and removal eucalyptus in these areas

- **Pollution surveys**

Pollution surveys are yet to be done however some water sampling has been done at the RGS 2GB3.

- **Environmental Impact Assessment**

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

- **Pollution & effluent control**

The area has a few urban centers that have no sewerage systems and treatment works. The effluent from these urban centres is discharged indirectly into the river.

- **Catchment and groundwater protection areas**

Aberdare National Park part falling under this area has not been fenced off although it is gazetted by KFS as a protected area. The community needs to be capacity build on good land use practices, though there is some initiative to identify degraded areas and plant trees. The new PELIS (Plantation Establishment for Livelihood Improved Scheme) system is envisaged that it will be introduced later in the area.

### 7.2 Targets

Protection of the reserve, quantity and quality in Upper Malewa river and its tributaries

### 7.3 Proposed Outputs

- Protected reserve quantity and quality
- Pollution survey reports and effluent control plans
- Gazetted catchments and ground water conservation areas

## 7.4 Proposed Activities

- Protect reserve quantity

Resource protection			
Target	Protection of the reserve quantity and quality in Upper Malewa river and tributaries		
Output	<ul style="list-style-type: none"> <li>• Protected reserve quantity and quality</li> <li>• Pollution survey reports and effluent control plans</li> <li>• Gazetted catchments and ground water conservation areas</li> </ul>		
Activity	Sub-Activity	Timeframe	Budget
Protect reserve quantity	River flow gauging for analysis of Q95 at the identified points	1day per month for 12 Months	Covered in chapter 5 (water balance)
	Review of existing data (2GB3 and rainfall stations)	1 Week	Stationery =1000 No Wrua cost
	Computation of existing data	1 week	Stationary: =1000 No Wrua cost
	Preparation of flow duration curves	1 week	Stationary: =1000 No Wrua cost
	Installation of traffic light system gauges/signboards along the rivers and at a significant public place	5 days	2 gauges: No Wrua cost 1 sign post:10,000 Painting &panel beating 5000 Fuel: 50ltrs *1*110= 5500 Lunches: WRUA 5*300*5 = 7500  Total: 28 000
Protect reserve quantity/quality	Enforce Maintenance of the reserve quantity/quality	Quarterly for 1 year	Fuel: 50ltrs *1*110*4= 22000 Lunches: WRUA 3*300*4=3600 Total - 25600
Establish the current WQ status	<ul style="list-style-type: none"> <li>• Identified points and the hotspots in the sub catchment (Conduct Pollution survey)</li> </ul>	6 days	Lunches: WRUA 4*300*6 = 7200  Stationery = 1000  Total = 8200
	<ul style="list-style-type: none"> <li>• sampling, and analysis</li> </ul>	To be done concurrently with the above	Transport to labs=2000 Laboratory fees = 20,000 Stationery = 2500 Total 24 500
	<ul style="list-style-type: none"> <li>• Mapping of point &amp; non point sources of pollution</li> </ul>	1 week	Stationery: 5000

			No direct Wrua cost Total 37700
Sensitization on EIA	Capacity Building (10 barazas)	10 days	Covered in chapter 6 (water balance)
Gazetted catchments and ground water conservation areas	Sensitization on PELIS and good land use practices	2 weeks	Fuel: $40\text{lbs} * 110 * 2 = 8800$ Lunch: WRUA $5 * 300 * 12 = 18000$ PA, Agric, KFS: $3 * 500 * 12 = 18000$  Total: 44800

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## 8 CATCHMENT PROTECTION

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Key Themes:

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

### 8.1 Current Status

- Surveys & conservation of Riparian areas

Sensitization of communities along the riparian land on river bank has been done.

Pegging has not been done. Removal of eucalyptus trees along the rivers is being carried out approximately 3 kms cleared already in the main Malewa river.

- Erosion and sediment surveys

Initiatives have started on erosion and sediment surveys. Farmers have been sensitized on terracing and putting grass strips

- Soil and water conservation plans

Process on preparation of land use plans is yet to start but WRUA is willing to start off upon proper sensitization by the relevant government departments.

- Catchment rehabilitation

No activity has been started yet.

### 8.2 Targets

To protect & conserve the catchment

### 8.3 Proposed Outputs

- Controlled soil erosion
- Increased water flow in quality & quantity
- Controlled evaporation rate

### 8.4 Proposed Activities

- Catchment Rehabilitation
- Pegging & protection of riparian land: .....Km
- Soil conservation

<b>Catchment Protection</b>			
<b>Target</b>	To protect & conserve the catchment		
<b>Output</b>	<ul style="list-style-type: none"> <li>• Controlled soil erosion</li> <li>• Increased water flow in quality &amp; quantity</li> <li>• Controlled evaporation rate</li> </ul>		
<b>Activity</b>	<b>Sub-Activity</b>	<b>Timeframe</b>	<b>Budget (KShs.)</b>
Catchment rehabilitation( afforestation)			
Awareness creation	Mobilization of the community	2 weeks	Stationery postage and air time costs= 4 000



	Capacity building	12 site meetings	Lunch: forester, agric 12*2*500=12,000 Transport: 2*150*12=3600 Lunches Wrua 5*300*12=18000 Prov.admin 1*500*12= 6000 Total 39600
	Law enforcement quarterly for a year		Lunch:(AP&PA) 3*1000*4=12,000 Transport = 10,000 Wrua off. 5*300*4=6000 Total = 28 000 Grand total =61000
Tree planting (indigenous and exotic)	Identification of sites for planting	1 month	Wrua lunches 5*12dys*300=18 000 PA , MoA , KFS, 500*3*6days=9000 Total 27000
	Purchasing of Seedlings	3 years	45 million
	Pitting	3 years	15 million
	Planting	3 years	6 million
	Monitoring and maintenance of seedlings	3 years	3 million
	Promotion of alternative sources of energies e.g biogas)	1 field day/year for 3 yrs	MoA, PA, lunches5*500*3f/days=7500 Fuel 30ltrs/d*3dys*110 =9900 Stationery and equipments -lump sum = 50000/yr*3= 150000 Total =167400 Grand total=69.1944million
Establishment of tree nursery	Identification of site	1 week	Lunch WRUA: 9*1*300 = 2700
	Site preparation-3 sites	3 months	Ploughing: ¾acre*5000=3750 Harrowing: 2200*2=4400 Raking/seedbed: Casuals: 5*200*4 days*3 sites=12000 Total = 20150
	Spreading of seeds	1 day	Casuals: 3*3*200=1800
	Fencing	1 week	Chain link: 4*3*2000 = 24,000 Posts: 50*3*70=10500 Labour: 4*3*200=2400 Total=36900
	Soil sourcing/importation	3 days	Lunch: 3 WRUA*300*3= 2700  Soil and transport: 7tons*3*1000=21000  Total 23700

	Packing	3 wks	Labour: $5*18days*3sites*200=54000$
	Transplanting	3 wks	Labour: $5*18days*3sts*200=54000$
	Maintenance	9 months	Casual: $2000*9\ months*3sites=54000$ Grand total=244550
Wild Fires in forest area	Awareness creation on dangers of wild fire	Refer awareness creation on tree planting	Refer awareness creation on tree planting
	Law enforcement	Refer awareness creation on tree planting	Refer awareness creation on tree planting
Train farmers on proper land use practices along the slopes	Mobilization/sensitization	Refer awareness creation on tree planting	Refer awareness creation on tree planting
	Train farmers	Quarterly	Lunch: forester/agric $12*2*500=12,000$ Transport: $10*120*12=14400$ Others $5000*12=60000$ Total=86400
Identify riparian land boundaries	Check/search the official forest boundaries with the Ministry of land	2Weeks	Lunch WRUA: $3dys*2*300 = 1800$ Transport $200*3*2=1200$ Search fees= 500 Total = 3500
Protect riparian land Peg and fence off the delineated riparian land.	Delineate boundaries on map sheets	1 day	WRUA lunches $3*300= 900$ KFS, MoA, Lands lunches $3*500= 1500$ Transport $200*2=400$ Total = 2900
	Verification of ownership	1 week	3 WRUA executive $3*300*7 = 6300$ PA, MoA $500*7*2 = 7000$ Total 13300
	Reclaiming/processing of title deeds (reclaim riparian land)	1 year	WRUA executive, PA, Councilor, Lump Sum – 100,000/-
	Pegging of riparian land	1 Month	WRUA lunches $20*5*300= 30000$ KFS, MoA, $2*20*500=20000$ Total 50000
	Planting of live fence	Refer to tree planting	Refer to tree planting
	Fencing off forest boundary	5 years	KFS and KWS Grand total = 166200
Harmonize	Organize stakeholders	2 days	$200,000*2 = 400,000$

riparian land policies of various government institutions	workshops on riparian land law concerning the riparian lands	workshops	
	Community sensitization meetings on policy guidelines	Quarterly	WRUA lunches 300*5*4*3=18000 MoA,KWS,KFS,NEMA,PA,Lands lunches 6*500*4*4= 48 000 Total = 66000 Grand total = 466 000

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## 9 INSTITUTIONAL DEVELOPMENT

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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 but there is need to sensitize new members to join the WRUA.

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 does not have an office but currently is housed by the Assistant Chief. They require an office, furniture, computer, communication facilities, mobility and stationery etc. Therefore there is need to acquire land and construct a permanent office.

### **Stakeholder Coordination Activities**

The WRUA is currently working in collaboration with partners such as WRMA, WWF, KFS, CFA, Agriculture, local Authorities and Provincial Administration.

### **Identification**

The main objective of SCMP is to enhance stakeholder's participation on catchment areas and water resources management.

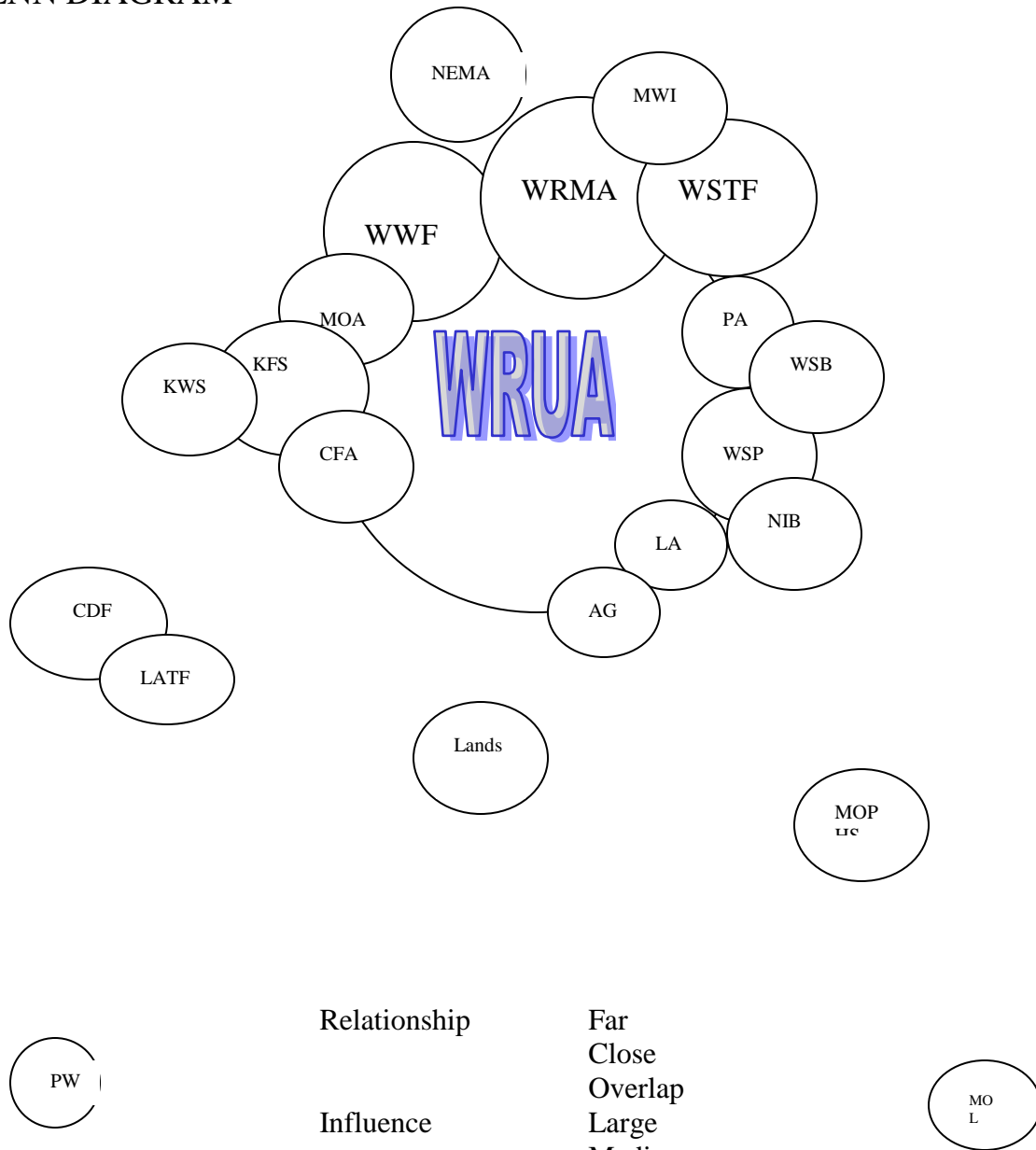
The following stakeholders were identified:

1. Water Resources Users Association (WRUA)
2. Kenya Forest Service (KFS)
3. Attorney General(AG)
4. National Environment Management Authority (NEMA)
5. Water Resources Management Authority (WRMA)
6. Kenya Wildlife Services (KWS)
7. Provincial Administration (PA)
8. Ministry of Agriculture (MoA)
9. Ministry of livestock(L)
10. Ministry of Water and Irrigation(MWI)
11. National Irrigation Board(NIB)
12. Ministry of Lands
13. Local Authorities (LA)
14. Community Forest Association (CFA)
15. World Wide Fund for Nature (WWF)
16. Ministry of Roads
17. Water Service Trust Fund(WSTF)
18. Constituency Development Fund(CDF)
19. Local Authority Trust Fund(LATF)
20. Water Service Providers(WSP)
21. Ministry of Public Health and Sanitation(MoPHS)
22. KenGen

### **Stakeholder Analysis (Chapatti Method)**

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:

# VENN DIAGRAM



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

## 9.2 Targets

Strengthen the WRUA through capacity building

To understand and promote stakeholders roles and responsibilities

## 9.3 Proposed Outputs

Strong and effective WRUA

## 9.4 Proposed Activities

Conduct TNA

Conduct Trainings

<b>Institutional Development</b>			
	<b>Target</b>	Strengthen the WRUA through capacity building To understand and promote stakeholders roles and responsibilities	
	<b>Output</b>	Strong and effective WRUA	
<b>Activity</b>	<b>Sub-Activity</b>	<b>Timeframe</b>	<b>Budget (KShs.)</b>
Conduct TNA	Develop assessment tool or checklist	2 days	Office stationery = 2000/-
	Distribution and collection of the TNA tool	1 week	Transport WRUA:25 members@200= 5600 Lunch WRUA= 25 members@300= 8400 Total=14000
	Produce TNA report	1 week	Office stationery = 2000/- Grand total =18000
Conduct Trainings	Prepare Training Plan	2 days	Office stationery = 4000/-
	Carry out training	3 days	Hall hire: 3days@1500= 4500 Fuel: 30ltrs/d*3*110= 9900 Meals: 35@500*3=52,500 Facilitators: 5@3500 *3= 52500 WRUA transport - 25 members@200*3 = 15000 Stationery:5000 (Lump sum ) Total=139 400
	Prepare Training Report	1 week	Office stationery = 2000/-

			Grand total 141400
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## 10 INFRASTRUCTURE DEVELOPMENT

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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 60% of the population has piped water. There are 2no public earth dams in the area though they are highly silted up. No ground water storage has been identified however there is 1no individual borehole. The area is not prone to floods due to its topography

### 10.2 Targets

To increase water storage facilities

### 10.3 Proposed Outputs

- Improved infrastructure leading to increased water quantity
- Reduced water use conflicts

### 10.4 Proposed Activities

- Rain water harvesting
- Reclamation of encroached areas
- Dam/Pan desilting
- Construction of new dams/pans
- Construction of common intakes for the projects

<b>Infrastructure Development</b>			
<b>Target</b>	To increase water storage facilities		
<b>Output</b>	Increased water storage		
<b>Activity</b>	<b>Sub-Activity</b>	<b>Timeframe</b>	<b>Budget (KShs.)</b>
Rain water harvesting	Sensitization/Demonstration on water harvesting technologies at household level	1 month	3 No. Plastic Tanks:@ 30,000=90000 Guttering materials: 10,000*3=30000



			Transport: 6000 Labor: 12500 lump sum (community) PA $1*3*500=1500$ Wrua lunches $5*300*3=4500$ Total = 144500
	Sourcing of storage plastic tanks for household level	3 years	500 tanks*25000= 12.5million Support structures and guttering=500*5000=2.5million Total = 15million
Encourage construction of water storage facilities	Awareness creation	Refer awareness creation on tree planting	Refer awareness creation on tree planting
	Identify existing sites for storage facilities	1 day	1 committee meeting $5*300 = 1500$
	Verification of ownership	1 week	3 WRUA executive $3*300*7 = 6300$ PA $500*7*1 = 3500$ Total =9800
	Searching of land documents -Title deeds	1day	1 WRUA member (Nyahururu), lunch 300 Search fee=1,000 Transport $200*2= 400$ Total =1700
	Reclaiming/processing of ownership (reclaim public access paths to the river-)	1 year	WRUA executive, PA, Councilor, Lump Sum – 100000
	Feasibility study and surveying of identified dams	3 wks	Fuel $20\text{ltrs/day} * 110 * 18 = 39600$ 5 WRUA- $5*300*18\text{days} = 27000$ WSB - $2*2500*18= 90000$ Stationery reports – lump sum = 10000 Total = 166600
	Construction of 1 earth dam and rehabilitation of 2 pans	3 yrs	6 million
	Dam site maintenance and cleaning	Continuous	500,000
Install controlling devices (valves, meters, weirs, V notches)	Awareness creation on the need to install controlling devices	Refer awareness creation on tree planting	Refer awareness creation on tree planting
	Law/ By law enforcement	Continuous	Lump sum $50000/\text{yr} * 3 = 150000$
Construction of a common intake	Mobilization/sensitization	1 day	Lunches $5*300=1500$ PA Lunch = 500 Total = 2000
	Site identification	1 day	Lunches $5*300=1500$ PA lunch = 500 Total 2000
	Process legal documents	6 months	Application fees=92000

			Lunches 1*2days/month*6*300=3600 Transport 1*2*6*400= 4800 Total 100400
	Feasibility, survey & design	3 months	Lump sum 100,000/=
	Construction of common intake	1 year	Lump sump 3.5 million
4No Borehole construction and development	Site identification	1 day	Wrua lunches =5*300=1500
	Land acquisition	3 weeks	Lump sum = 900,000
	Borehole siting	1 week	Lump sum = 120 000
	Drilling permit application	3 months	Application fees=37 500 Transport = 1 *700*2=1400 Lunch 1*1200*2= 2400 Total 41300
	Drilling and well equipping	3 years	4No Bhs*2.5= 10 million

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## 11 RIGHTS BASED APPROACH / POVERTY REDUCTION

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Key Themes:

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

### 11.1 Current Status

Everybody in the area has a right to access of water. Water use conflicts are experienced in the area.

Women are included in decision making in water matters though in low percentage while the youths are actively involved in all matters of water resources management in the area. The disabled and the disadvantaged are included in the decision making on environmental matters.

For the greater part of the year the ecosystem is not that threatened but during the dry season (January – March) the reserve water is almost depleted due to over abstraction for irrigation purposes.

The area has enough rainfall and the farmers practice dairy and subsistence farming to sustain their livelihoods. Nearly all farmers practice irrigation during dry seasons. Subsistence bee keeping, small holder floriculture farming, and tree growing for commercial purposes are activities that have emerged as alternative sources of livelihood and reducing poverty levels. Awareness on HIV and Aids and behavior change is being carried out by various local groups

### 11.2 Targets

- Equitably access to quality water (gender in consideration) to enhance sustainable livelihoods

### 11.3 Proposed Outputs

- Equitable access to water

### 11.4 Proposed Activities

- Awareness creation
- Encourage good farming practices
- Enforce mitigation measures on effluent discharging

<b>Right Based Approach/Poverty Reduction</b>			
<b>Target</b>	Equitable access to quality water (gender in consideration) to enhance sustainable livelihoods		
<b>Output</b>	Equitable access to water		
<b>Activity</b>	<b>Sub-Activity</b>	<b>Timeframe</b>	<b>Budget (KShs.)</b>
Awareness creation	2 barazas (in the sub location)	2 days	Fuel=20ltrs/d*2*110= 2200 Local groups, WRUA Lunches 10@300*2days = 6000 PA=1*2*500=1000 Total 9200

Encourage good farming practices	Demonstrations/field visits	6days	Fuel=20ltrs/d*6*110= 1320 Lunches = WRUA 5@300*6days = 9000 Prov.Adm=1*6*500=3000 Agr officer. = 6*500=3000 Total 16320
Enforce mitigation measures on proper sanitation	Sensitization of the community		Covered above (Awareness creation)
	Identifying defaulters	2days	Fuel=40ltrs/d*2*110= 8800 Lunches = WRUA 5@300*2days = 3000 Prov.Adm=1*2*500=1000 Public H. =2* 500=1000 Total13800
	Issue warnings to non compliant people/institutions	2days	Fuel=40ltrs/d*2*110= 8800 Lunches = WRUA 5@300*2days = 3000 PA=1*2*500=1000 Public Health. =2* 500=1000 Total 13800
	Sue the offenders	quarterly	Court expenses 150,000 (lump sum)

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## 12 MONITORING AND INFORMATION

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### Key Themes:

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

### 12.1 Current Status

There is a 1No gauging station (2GB3) in the sub catchment which is being monitored and data is available. However the collected doesn't give the correct representation of the whole sub-catchment. There are 4No of rainfall stations. (Huhirio Primary, Mureranjau Primary, Kirima secondary and Huhirio secondary schools) which are all currently operational). The annual average rainfall of the area is about 1500mm.

Water quality/pollution monitoring has not been initiated and no samples have collected so far.

Abstraction survey was undertaken however the actual water use could not be determined for none of the abstractors are fitted with measuring devices.

WRUA and WRMA share information on water sector reforms and policy matters through capacity building forums, barazas and exchange visits/tours.

Inter WRUA meetings in the Lake Naivasha basin are currently held after every two months.

Water resource monitoring is currently being undertaken by WRMA. However the WRUA (Upper Malewa) makes comments on water use permit applications from its area.

## 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 use of water	Site identification	2days	Lunches = WRUA 5@300*2dys = 3000 Total= 3000
	Sampling	2days per quarter	Fuel=20ltrs/d*2*110 *4= 17600 Lunches = WRUA 3@300*2dys*4 = 7200 Laboratory Fee=4000*2*4=32000 Total=56800
	Gauging	2days	Covered in chapter 5 (water balance)
	Determination of the actual water use	Done in chapter 6	Done in chapter 6
	Creation of a water resource monitoring data base	continuous	Stationery ,computer & software lump sum 60,000 Total= 60,000
	Sharing the information	continuous	Transport= 15000 lump sum Lunches= 12000 lump sum Stationary=4000 lump sum Total= 31000

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## 13 FINANCING AND IMPLEMENTATION

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Key Themes:

- Mechanisms to meet WRUA operational budget

SCMP investment budget

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

### 13.1 Current Status

#### WRUA operational budget

The WRUA has a savings Bank account with Equity Bank Olkalou branch AC/No. 0160101252626.

Sources of income for the WRUA are:

There are a total of 600 members but only 450 are active currently

### Mechanisms to meet WRUA operational budget

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

- membership registration fee is 500/=
- There is no provision for monthly contribution
- No contributions from Development partners have been received

### 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"> <li>• Financial management</li> </ul>	2 days	Fuel=20ltrs/d*2*110= 4400 Lunches = WRUA 13@300*2dys = 7800 Venue:@1500*2= 3000 Consultant fee =1@10000*2=20000 Total =35200
	<ul style="list-style-type: none"> <li>• Resource mobilization</li> </ul>	2 day	Fuel=20ltrs/d*2*110= 4400 Lunches = WRUA 13@300*2dys = 7800 Venue:@1500*2= 3000 Consultant fee =1@10000*2=20000 Total =35200

	<ul style="list-style-type: none"> <li>• Project Development and Management</li> </ul>	2 days	Fuel=20ltrs/d*2*110= 4400 Lunches = WRUA 13@300*2dys = 7800 Venue:@1500*2=3000 Consultant fee =1@10000*2=20000 Total =35200

## APPENDIX A

### MAPS

**APPENDIX B**  
**WORKPLAN AND BUDGET**

*(Use Excel Worksheet)*

		SUB-CATCHMENT MANAGEMENT PLAN			FINA
WRUA:					
CH	TOPIC	ACTIVITY	SET	BUDGET	
3	<b>Catchment Characteristics</b>				
	Target				
	Output				
	Activity				
	1				
	2				
	3				
4	<b>Management</b>				
	Target				
	Output				
	Activity				
	1				
	2				
	3				
5	<b>Water Balance</b>				
	Target	To assess, the water resources potential, reserve and balance			
	Output	Established water resource potential, reserve and balance			
	Activity	Gauging of rivers Malewa at 2GB3 and other streams			
	1	Identification of gauging points along Upper Malewa river & its tributaries	1	6200	



	<b>2</b>	Gauging at the identified points	2	74400
	<b>Activity</b>	Computation of demand, reserve and balance		
	<b>1</b>	Computation of demand, reserve and balance	2500	2125
<b>6</b>	<b>Water Allocation</b>			
	<b>Target</b>	To develop a water allocation Plan		
	<b>Output</b>	Water allocation plan		
	<b>Activity</b>	Verification/determination of the actual abstraction		
	<b>1</b>	Measurement of actual water abstracted e.g. volumetric, flow meter	1	28400
	<b>Activity</b>	Enforcement of compliance to permit conditions		
	<b>1</b>	Issue of WRMA orders, disconnections, reconnections, prosecutions	1	400000
	<b>Activity</b>	Development of a water allocation plan		
	<b>1</b>	Hire a consultant	1	700000
	<b>Activity</b>	Capacity building of community/WSPs on water use efficiency		
	<b>1</b>	10 public Baraza meetings	1	55000
<b>7</b>	<b>Resource Protection</b>			
	<b>Target</b>	Protection of the reserve quantity and quality in Upper Malewa river and tributaries		
	<b>Output</b>	Protected reserve quantity and quality Pollution survey reports and effluent control plans Gazetted catchments and ground water conservation areas		
	<b>Activity</b>	Protect reserve quantity		
	<b>1</b>	River flow gauging for analysis of Q95 at the identified points	1	0
	<b>2</b>	Review of existing data (2GB3 and rainfall stations)	2	1000
	<b>3</b>	Computation of existing data	3	1000
	<b>4</b>	Preparation of flow duration curves	3	1000
	<b>5</b>	Installation of traffic light system gauges/signboards along the rivers and at a significant public places	1	28000
	<b>Activity</b>	Protect reserve quantity/quality		
	<b>1</b>	Enforce Maintenance of the reserve quantity/quality	1	25600
	<b>Activity</b>	Establish the current WQ status		
	<b>1</b>	Identified points and the hotspots in the sub catchment (Conduct Pollution survey)	1	37700
	<b>2</b>	Sampling, and analysis	2	24 500

	3	Mapping of point & non point sources of pollution	3	8200	
	<b>Activity</b>	Sensitization on EIA			
	1	Capacity Building (10 barazas)	1	0	
	<b>Activity</b>	Gazetted catchments and ground water conservation areas			
	1	Sensitization on PELIS and good land use practices	1	44800	
<b>8</b>	<b>Catchment Protection</b>				
	<b>Target</b>	<b>To protect &amp; conserve the catchment</b>			
	<b>Output</b>	<b>Controlled soil erosion Increased water flow in quality &amp; quantity Controlled evaporation rate</b>			
	<b>Activity</b>	<b>Awareness creation</b>			
	1	Mobilization of the community	1	4000	
	2	Capacity building	2	39600	
	3	Law enforcement quarterly for a year	3	61000	
	<b>Activity</b>	<b>Tree planting (indigenous and exotic)</b>			
	1	Identification of sites for planting	1	27000	
	2	Purchasing of Seedlings	2	45000000	38
	3	Pitting	3	15000000	12
	4	Planting	3	6000000	5
	5	Monitoring and maintenance of seedlings	3	3000000	2
	6	Promotion of alternative sources of energies e.g. biogas)	3	69194400	58
	<b>Activity</b>	<b>Establishment of tree nursery</b>			
	1	Identification of site	1	2700	
	2	Site preparation-3 sites	2	20150	1
	3	Spreading of seeds	3	1800	
	4	Fencing	3	36900	
	5	Soil sourcing/importation	1	23700	
	6	Packing	3	54000	
	7	Transplanting	3	54000	
	8	Maintenance	3	244550	20
	<b>Activity</b>	<b>Wild fires in forest area</b>			

	1	Awareness creation on dangers of wild fire	1	0
	2	Law enforcement	2	0
	<b>Activity</b>	<b>Train farmers on proper land use practices along the slopes</b>		
	1	Mobilization/sensitization	1	0
	2	Train farmers	2	86400
	<b>Activity</b>	<b>Identify riparian land boundaries</b>		
	1	Check/search the official forest boundaries with the Ministry of land	1	3500
	<b>Activity</b>	<b>Protect riparian land (Peg and fence off the delineated riparian land)</b>		
	1	Delineate boundaries on map sheets	1	2900
	2	Verification of ownership	2	13300
	3	Reclaiming/processing of title deeds (reclaim riparian land)	3	100000
	4	Pegging of riparian land	3	50000
	5	Fencing off forest boundary	3	166200
	<b>Activity</b>	<b>Harmonize riparian land policies of various government institutions</b>		
	1	Organize stakeholders workshops on riparian land law	1	400000
	2	Community sensitization meetings on policy guidelines	2	466000
<b>9</b>	<b>Institutional Development</b>			
	<b>Target</b>	Strengthen the WRUA through capacity building To understand and promote stakeholders roles and responsibilities		
	<b>Output</b>	Strong and effective WRUA		
	<b>Activity</b>	<b>Conduct TNA</b>		
	1	Develop assessment tool or checklist	1	2000
	2	Distribution and collection of the TNA tool	2	14000
	3	Produce TNA report	3	2000
	<b>Activity</b>	<b>Conduct Training</b>		
	1	Prepare Training Plan/modules	1	4000
	2	Carry out training	2	139400
	3	Prepare Training Report	3	2000

<b>10</b>	<b>Water Infrastructure Development</b>			
	<b>Target</b>	To increase water storage facilities		
	<b>Output</b>	Increased water storage		
	<b>Activity</b>	<b>Rain water harvesting</b>		
	<b>1</b>	Sensitization/Demonstration on water harvesting technologies at household level	1	144500
	<b>2</b>	Sourcing of storage plastic tanks for household level	2	15000000
	<b>Activity</b>	<b>Encourage construction of water storage facilities</b>		
	<b>1</b>	Awareness creation	1	
	<b>2</b>	Identify existing sites for storage facilities	2	1500
	<b>3</b>	Verification of ownership	3	9800
	<b>4</b>	Searching of land documents -Title deeds	3	1700
	<b>5</b>	Reclaiming/processing of ownership (reclaim public access paths to the river-)	3	100000
	<b>6</b>	Feasibility study and surveying of identified dams	3	166600
	<b>7</b>	Construction of 1 earth dam and rehabilitation of 2 pans	3	6000000
	<b>8</b>	Dam site maintenance and cleaning	3	500000
	<b>Activity</b>	<b>4No Borehole construction and development</b>		
	<b>1</b>	Mobilization/sensitization	1	2000
	<b>2</b>	Site identification	2	2000
	<b>3</b>	Land acquisition	3	900000
	<b>4</b>	Borehole siting	1	120000
	<b>5</b>	Drilling permit application	2	41300
	<b>6</b>	Drilling of well and equipping	3	10000000
	<b>Activity</b>	<b>Install controlling devices (valves, meters, weirs, V notches)</b>		
	<b>1</b>	Awareness creation on the need to install controlling devices	1	
	<b>2</b>	Law/ By law enforcement	2	150000
	<b>Activity</b>	<b>Construction of a common intake</b>		
	<b>1</b>	Mobilization/sensitization	1	2000
	<b>2</b>	Site identification	2	2000
	<b>3</b>	Process legal documents	3	100400
	<b>4</b>	Feasibility, survey & design	3	100000



		<b>Total Budget Activity Set</b>	<b>1</b>		
		<b>Total Budget Activity Set</b>	<b>2</b>		
		<b>Total Budget Activity Set</b>	<b>3</b>		

**APPENDIX C LIST OF ATTENDANTS**

<b>No.</b>	<b>Name</b>	<b>Area/Project</b>	<b>Contact</b>	<b>M</b>	<b>F</b>
1.	Enock Okemwa	WRMA/NSA	0722627281	M	
2.	Peter Kamau Ng'ang'a	Chair – Mukuru WP	0710581976	M	
3.	Mathanga Gachigi	Bondo WP	0726342775	M	
4.	Mwangi Kihara	Malewa WP	0720960003	M	
5.	John Karanu	Munyaka WP	0727076220	M	
6.	Philip Mwangi Kiiru	Kianda WP	0726343610	M	
7.	Francis G. Ruku	Chabuthwa Ph11 WP	0725354084	M	
8.	John Githinji	KiandaWP	0727797607	M	
9.	Peter Mwangi	Mutamaiyu	0726859167	M	
10.	Simon Gachicho	Mutamaiyu	0713459825	M	
11.	James K Mwangi	Ass. Chief	0236324	M	
12.	Paul Kang'ethe	Councillor	0721650667	M	
13.	Simon Macharia G	Mutarakwa	0728148132	M	
14.	Reuben Gachau	Ihiga		M	
15.	John Macharia K.	Chabuthwa	0726110695	M	
16.	Joseph Kamunya	Mutarakwa		M	
17.	Beth Wangari	Malewa			F
18.	Jane Wambui	Murata			F
19.	Paul Kanyeki kariuki	Chair Murata	0728274016	M	
20.	Michael Kariuki	Upper Malewa		M	
21.	Bedan Kahuthu Kamime	Malewa	0727082127	M	
22.	Harun Gichora Gachau	Treasurer Murata	0720590127	M	
23.	David Mwangi Ng'ang'a	Chair Munyaka	0720376694	M	
24.	Geofrey Mbugua Njuguna	Sec Thome	0725905678	M	
25.	Sammy Michira	Chair Upper Malewa	0725329136	M	
26.	Peterson Ndegwa Mwangi	Malewa	0724373335	M	
27.	Daniel Macharia Wairimu	Witeithia	0721733314	M	
28.	Anne Wambui Mwangi	Malewa	0726782901		F
29.	Anne Wanjiru Kuria	Mwiteithia	0725275267		F
30.	Lydia Wangeci	Rwara			F
31.	John Maina Ndung'u	Munyaka WP	0726766271	M	
32.	Patrick Wahome	Baraka WP	0722522556	M	
33.	Joseph Marichu	Munyaka WP	0711509187	M	
34.	David Muriithi	Munyaka WP	615 Ol kalou	M	
35.	Amos Kagwe	Kianda WP		M	
36.	Daniel Mwangi Mugo	Chair Thome WP	0721398093	M	
37.	Harun Njuguna Wambiru	Treasurer Thome WP	0727144841	M	
38.	Francis Muchiri Gicheru	Chair Waiteithie WP		M	
39.	Regina Githua	WRMA	0721256238		F
40.	Adeline Akinyi Oduor	WWF	0728600154		F
41.	Catherine Wachira	WWF	0725976022		F
42.	Amos Kagui Njoroge			M	
43.	Canute M. Mwakamba	SRM-WRMA	0720540554	M	

44.	Jackson G. Mwangi	WRMA	0723259534	M	
45.	Dominic Wambua	WRMA	0722 646051	M	
46.	Michael Wachira	WRMA	0722286767	M	

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**APPENDIX D ABBREVIATIONS AND ACRONYMS**

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CAAC	Catchment Area Advisory Committee
CMS	Catchment Management Strategy
KWS	Kenya Wildlife Service
MWI	Ministry of Water and Irrigation
NWRMS	National Water Resources Management Strategy
SW	Surface Water
WQ	Water Quality
GW	Groundwater
WRMA	Water Resources Management Authority
WSB	Water Service Board
WRUA	Water Resources User Association
WSP	Water Service Providers
LA	Local Authority
WWF	World Wide Fund
CFA	Community Forest Association
MoA	Ministry of Agriculture
NEMA	National Environmental Management Authority
MoH	Ministry of Health
KFS	Kenya Forest Service
PA	Provincial Administration
Inst	Institutions
LANAWRUA	Lake Naivasha WRUA
TARDA	Tana and Athi Rivers Development Authority