

KITUI RIVER DAMS

**WATER SUPPLY, SANITATION AND
CATCHMENT CONSERVATION**

PROJECT PROPOSAL

SASOL FOUNDATION

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SASOL FOUNDATION

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1. NAME OF PROJECT

Kitui River Sand Dams and Catchment Conservation Project.

2. IMPLEMENTING NGO

SASOL (Sahelian Solutions Foundation).

3. LOCATION OF PROJECT

Central and Kyuluni Divisions of Kitui District.

4. PROJECT OBJECTIVES

Reduction of poverty through development of water resources with catchment and conservation approaches.

(A) PROJECT OUTPUTS

1. 100 functional river sand dams with improved offtake wells
2. 4 conserved catchment areas
3. 10 trained community sanitation extensionists per village.
4. 40 water community based organisations.

(B) PROJECT ACTIVITIES

1. Construction of river sand dams
2. Terracing of catchments for conservation
3. Training in community organisation to improve existing structures.
4. Training village extensionists in hygiene and sanitation.

5. DURATION OF PROJECT

3 years

6. TOTAL BUDGET FIGURE for 1st Year

KShs. 8,739,230

7. AMOUNT REQUESTED FROM SIDA (Year 1)

KShs. 5,888,930 (67%)

8. ESTIMATED COSTS FOR YEAR 2 AND 3

Year 2: KShs 10,924,000

Year 3: KShs 12,562,000

Total project costs: KShs 32,225,230

Total contribution requested for 3 years from SIDA: KShs 21,600,000

2. BACKGROUND INFORMATION

2.1 Situational Analysis

The project is based at the Central and Kyuluni Divisions in Kitui District.

2.11 Social - Economic status of the project area.

The economic activity in the area is dominated by subsistence agriculture and livestock production. Sale of agricultural produce and livestock generate the bulk of incomes. Additional family income is generated through labour export. This factor results in many female headed households. 50% of the working males are wage earners outside the area. 65% of the household are female headed.

Population density in Central and Kyuluni Divisions are given as 161 and 134 respectively per sq Km.

The project area is a rainfall deficit region receiving between 500 - 800mm per year. Furthermore this rainfall is irregularly distributed and there is generally a total failure in 1 out of 3 rainy seasons. The land is that prone to droughts and frequent crop failures. This land is semi-arid and is classified as Agro-Ecological zone 4/5 according to the Jaetzold classification. The rainfall is bimodal, the first rains occur in April to June and a highly unreliable. The second rains regarded as the major rains start in October and tail off indeterminately in late December/early January.

The project area is in the heart of Kamba country. The population is nearly wholly Kamba with a sprinkling of other immigrants working as teachers traders. The basic cultural organisation is thus based on the Kamba tradition which has a strong Mwethia organisation tenet (an informal voluntary organisation which includes all members of the community irrespective of gender and/or age for communal work).

2.2 Purpose Statement

The main problem in the area is poverty as a direct result of reliance on agricultural and livestock production which in turn is dependent highly unreliable rainfall.

The problem of communal poverty is thus basically a water based problem. To address the poverty problem the water needs in the project area must thus be addressed.

Addressing increased access to water resources is a major objective in the Kitui District plan 1994-1996. Two major methods of improving water availability in the area is through catchment protection and construction of sand dams on sandy river beds to retain received precipitation on the land.

This project seeks to lead with the construction of sand dams on ephemeral rivers to retain water in these coupled with creation of environmental awareness and action toward terracing and tree planting. The measures taken together can realistically

transform a catchment and improve the incomes from agriculture and livestock production.

2.3 History of the Project

SASOL River Sand dams project was started as a vehicle to put into practice the ideas of a development manager, a development planner and a ground water expert. The originators realised that water could be harnessed cheaply if the proper structures are instituted with the help of the community. To be able to do this, however, a river catchment should be developed in total.

The catchment approach depends on the Cupertino by the community in developing sequential sand dams in their dry rivers coupled with terracing and tree planting on individual plots. Thus there is an element of communal and individual work.

The sand dams construction started in 1995 March with a pilot project on the Kiindu river. The pilot enabled SASOL to test the initial thinking and the practicality of instituting the system. It was also a test of the technology involved and the working systems in community organisation in this type of work. The pilot project was completed in August 1995. The sand dams constructed during this period received water in the October rains that year. We have observed a dramatic increase of water level at Kamumbuni sand dams where the scoop holes used to go down to 12ft but now the water level after the last long drought was only at 4ft.

The pilot was followed by "25 sand dams projects" on the same Kiindu river catchment. The main sand dams construction and their associated offtake wells was completed in November 1996.

Estimated water holding capacity on this river after the project is estimated at more than 1.1 million Cubic Metres. This water supplies drinking and vegetable irrigation water for 26100 people in Mulango and 8000 people in Kisasi. Extensive terracing has been carried on in this catchment. Records of this terracing is being recorded together with the community and results will be available in February 1997. Tree planting has lagged behind in the area due to lack of water for raising tree seedlings. A series of nurseries in the community are due to be started. Numbers and types of trees which will be planted will be reported on an "Impact Assessment PRA for Kwa Muli/Kyangunga sub-locations" scheduled for October 1997. Just prior to the tree planting season.

This project compliments the work SASOL does on providing school based shallow wells. The shallow wells provide clean water to the community within a 2km distance from the school. Through the complimentary projects a water-net is created. This ensures that each household eventually has access to a waterpoint near the household.

2.4 Background documentation

1. " Baseline data on environmental Impact Assessment of Kiindu and Kyuusi rivers in Kitui District".
2. This environmental study is designed to show the changes of vegetation type and cover in the project area as a result of the water stored by the created sand dams. Other issues under investigation are the affection soil salinity and acidity as a result of the anticipated raising of the water table. This survey was commenced on March 1996 and first year report will be ready by February 1997.
3. " Kiindu River Basin Sand dams System constructed under the pilot and 25 sand dams projects report".
4. This report shows the methods used in running the projects and gives some of the results of water stored in the river system. Additional information on the number of terraces constructed will be added when this data is due in February 1997.
5. " Sand dams Project Impact Assessment using PRA for Kyangunga/Kwa Muli sub-locations".
6. This assessment gives the baseline data for 2 sub-locations at the end of the sand dams construction period. This was carried out before most of the sand dams were filled with water. A subsequent assessment planned after a years time will show the changes achieved by the project.

3. PROJECT DESCRIPTION

3.1 Overall Goal

The goal of this projects is the reduction of poverty in the community.

This would be achieved by harvesting and storing rainfall water for human, livestock consumption and production. The availability of water will impact directly on health and incomes of the community.

3.2 Purpose of the Project

The project aims to increase the supply of available water to the community through the adoption of the catchment development and conservation approach. The elements of this approach include construction of river sand dams, terracing and tree planting on the agricultural lands, as well as hygiene and sanitation education.

At the end of the project the community should have a source of adequate water throughout the year and not only for a short time after the rains. Less time in the household should be spent on water chores as water points increase and are nearer to the community. Also the quantity of water reduces time spent at a waterpoint waiting for slow seepage to collect only a tiny amount of water in the hole.

Impacts of the project will be measured by PRA type of data collection. At the onset of the project baseline data will be established showing the existing situations against which future assessments can be gauged to establish changes.

3.3 Outputs

This project aims to produce an increased number of river sand dams whose water losses below a depth of 30 cm is negligible. Offtake wells constructed on the sand dams, enable the community to access a better quality of water than that found in scoop holes which are contaminated by all nature of extraneous matter. Increased awareness and practice of water catchment management and conservation on the farms, increased number of effective CBO's involved in water and adoption of additional water technologies.

It is anticipated that 100 river sand dams, 75 offtake water wells, 40 water-based CBO's, 1 alternative technology where dams are not possible, 25% of households made aware of catchment approach and hygiene and sanitation, will be achieved in 3 years.

Most of these outputs will be assessed through actual monitoring and reporting.

3.4 Activities

The project will identify sand dams and well sites, organise the community through an entry PRA, and construct the sand dams and wells.

It will also train the community to create formal organisations based on the informal Mwethia groups enabling them to institute viable constitutions thus strengthening the organisations. These organisations will be able to raise funds when formalised such as to purchase a pail and chain for lifting water using the windlass and lead to a transformation into effective water CBO's. The CBO's who will be responsible for organisation of community labour for the facility and maintenance and accommodation of the artisans at site and will plan the long-term maintenance of the facility. It will also identify and test a new technology for applicability in the community.

The CBO will in effect be a forum through which hygiene and sanitation activities can be undertaken to reach the whole community. From previous experience, SASOL has found that Community Based Health Attendants are an effective way of transmitting sanitation messages. For a wholesome development sanitation will be included in the overall CBO training.

The activities in the project are to be carried between SASOL and the community. It is paramount that sites are located by community together with SASOL to satisfy both technical and practical needs of the facility. It is only in this case will the community identify with and have complete ownership of the facility. This allows for care and maintenance as necessary.

3.5 Inputs

Personnel - 1 Field Manager, Mr S M Mutiso

- 1 Office assistant, Miss M Maingi
- 1 Technical Field Supervisor, Mr D N Kithuku
- 1 Training Supervisor
- 12 Artisans
- PRA Trainers hired per training
- Accounting services subcontracted

Material Inputs

Construction material external - SASOL
Cement, Iron bars

Construction material local - Community
Sand, stone, water

Equipment - SASOL

Community inputs

Organisation
Accommodation and welfare for artisan
Labour
Maintenance

No other donors are involved in the project.

4. SOCIAL ASPECTS OF THE PROJECT.

4.1 Beneficiaries

The beneficiaries of the project will be the following communities, having a population of

Mulango	26,000
Kisasi	20,000
Itoleka	11,000
Nzambani	41,000
Total	98,000

Out of these we estimate that 50% will be constantly using the facilities throughout the year, while in drought periods more than 100% will make use of the water, as people from outside these areas will be coming to fetch water. Amongst these, the women who together with children bear the brunt of the water chores will gain maximum benefits.

Time for fetching water would be shortened from about 6 - 12 hours in dry season to a maximum of 2 hours for those furthest from the river. In the short run also the women and children gain from the better nutrition stemming from vegetable growing on river valleys which follows immediately after there is enough water for bucket irrigation as observed in the previous project on the Kiindu. In the long run the whole community gains as the land productivity improves from the sale of vegetables and farm products

coupled with water related economic activities such as brick making thus improving income.

4.2 Involvement of beneficiaries in the project

The beneficiaries have right from the beginning been involved in the project. A meeting with community leaders through the Chiefs Office which contacted SASOL have explained to the people the need for water management in the community. The community as a whole has given a commitment to undertake the project.

Together with community representatives the sites for the initial part of the project the Kisiio/Mwiwe river have been identified. These are the sites where the community has agreed to develop sand dams and offtake wells. Their commitment to collect stone for the construction has already been demonstrated by collecting stone at the specific sites.

4.3 The role of women in the project.

Women play a major role as the water managers in the household. As the project is mainly on water, they have a large role to play in it. They decide which areas are most convenient to obtain water and the distribution of these points for maximum coverage. In the community meetings, the women voice is heard loud and clear. In fact in the project on the Kiindu, more than half of the sites developed were overseen by chair-ladies, who organised the sum total of work at the site as well as organising for increased male involvement to support their work.

4.4 Governance

The project is designed to give the community maximum responsibility in its running of its own water projects. The artisans working on the project are in the hands of the community who take responsibility of their welfare.

All material which is delivered to site is received and stored by the community who is responsible for its security. Normally stores are established at the homestead of one of the community homesteads near the site. The chairperson or member of the site committee together with the owner of the store is responsible for all store issues. Records of the store issues are kept both by the community and the artisans. It is important to note that material orders are delivered by delivery notes from the suppliers to specific sites who are the recipients. Payments are made on the strength of material receipt by the community in good order. The community certifies the receipt of material in the presence of SASOL staff. This method ensures that the community right from start create a sense of ownership and create an interest in protection of the received assets which they identify with. Under the circumstances it is difficult to tamper with the supplies as there is collective responsibility for the material. It is also an incentive to collect local material which is needed to complete work at the site.

Since material delivered to a community is for a specific purpose, it cannot be diverted into any other use. If for an unseen reason the material cannot be used at the site, SASOL has an option to transfer it to a different site in agreement with the community.

Fortunately this has not happened in the past. Also, any residual material is transferred to the next site. To do this the community releases such material with proper documentation and is advised where it will be used. This material is received at the new site using the same procedure as if it came from the supplier.

The system is designed to educate the communities to take responsibility of public goods. This should eliminate the highly destructive notion that it is not theirs and can therefore be plundered. Rather as a public asset it is for the good of the community and everyone should ensure its well-being.

5. ENVIRONMENTAL ASPECTS

The main thrust of the project is the retention of precipitation on the catchment where it is received. The direct consequence of this is increased water content in the catchment which would lead to raised water table levels both on the river beds and the adjacent land.

Raised water table levels would mean that shallow wells have water nearer to the surface and scoop holes on sandy river beds are shallower. Loss of life as a result of being buried by collapsing deep scoop holes will thus be eliminated. Thus safety at these scoop holes is improved.

Increased amount of water available throughout the year will encourage vegetable growing in river channels using bucket irrigation. Napier grass and associated plants can survive throughout the year to protect river banks during a storm at the same time providing fodder for animals during the dry season.

A raised water table will also facilitate new colonising plants which could not grow before. On the other hand some plants will die due to water logging. Overall however ground cover should be improved.

Through terracing, water should be held on higher grounds of the catchment for longer periods. This will result in the soil remaining moist for longer, facilitating a longer period conducive to crop production. Some of the water held in the higher grounds eventually flows through the ground into the river channels recharging them. This phenomenon ensures adequate supplies of water even in extended droughts.

The availability of water will mean that tree seedlings can be grown. The non availability of seedlings in the locality has been one of the biggest hurdles to tree planting in the past. Additionally when tree nurseries are developed in the community only trees people desire to plant are grown. Tree planting exercise then continues smoothly as all the community stands to gain by planting trees, the impetus once initiated is self sustaining.

With a raised water table and higher ground cover, evapotranspiration is increased. Further more increased ground cover reduces runoff, facilitating percolation and higher soil storage space recharge rates. Theoretically once the improvement cycle is started it should go on perpetually.

There is a possibility that the raised water level can result in waterlogging, salinity and sodicity. Although this is a remote chance it is a situation which we are watching closely and a major study in this area is already in progress, which would alert us to the possibility of this occurring.

Part of project proposal is a small monitoring system to observe changes in water levels and observe vegetative and water quality changes.

6. ECONOMIC ASPECTS OF THE PROJECT

District focus for development is the official policy for GoK. Thus each District Development Committee designs its own agenda for development in the district.

The Kitui District Development plan stipulated among its main objectives, two areas which are addressed in this project:

- (1) Increase of accessible water resources in the district.
- (2) Improvement of Women Group Management skills for effective economic development.

6.1 Percentage Coverage of Beneficiaries

During the rainy season, there are many temporary water points in a community. Only a few people draw water from the rivers. In the case of extended droughts, however, these river channels are the only sources of water for the community. The beneficiary coverage is therefore variable depending on the season, as stated above.

On the other hand the terracing exercise which is an integral part of the project will benefit all the beneficiaries all the time. A dramatic demonstration of this is achieved by bringing to the attention of the community, that the people who have developed terraces on their farms usually realise a harvest and reduction of erosion when their neighbours without terraces have none. All this is due to the additional moisture held on the land for production.

Further, the training involves the application of appropriate marketing strategies for produce. In the previous project it was a joy to hear one woman tell the community that as a result of the training, Mary Kimanzi realised the highest return of her produce ever by selling at the appropriate time. She reckoned that she made at least three times the returns she would have realised if she sold immediately after harvest.

The hygiene and sanitation education is expected to raise directly the health of the community.

6.2 Sustainability of the project

A very strong training element in the project using Participatory Rural Appraisal (PRA) techniques is the basis of its sustainability. Apart from identifying the site, labour

contribution in development, accommodating and feeding the artisans, a monetary contribution for the purchase of the pail with a chain or a stock of the moving parts of a pump, will give the community a strong sense of ownership through collecting money and paying for these goods as already observed in other water projects; this leads to the community maintaining and sustaining the facility.

From the onset of the project, the community takes charge. Since they develop their own asset and provide a major input in it in terms of organisation, material and work, they have the highest stake in the assets. Under the circumstances the community identify with the project and commit to protect maintain and enhance its attributes.

6.3 Exit Strategy

As the end of the project a formal commissioning of the project offers the community an opportunity to review their achievements and congratulate themselves for realisation of the goals they set out to achieve, in this ceremony a renewal of the commitment to take care of the project is made.

7 (a) ASSUMPTIONS

The success of the project is based on the following assumptions.

1. Continued political stability
2. As minimum of 50 mm rainfall is received to create sand dams with water.
3. The community has the long term will to contribute effectively towards the project and makes a commitment for catchment and water conservation approaches which would be maintained and sustained.
4. Ongoing co-operation and acceptance of SASOL staff by the community, with mutual respect being elicited between the interacting groups.

7 (b) RISKS

1. Collapsed national security - This is unlikely in the foreseeable future.
2. Flood hindering work on the river bed. Not likely
3. No rain at all, so the sand dams remain dry. Not likely.
4. Famine, making people so weak they are unable to undertake the project.
 - This is likely if there is sustained low harvest for 3 seasons continuously.
 - An allowance in contingencies for possibly feeding the work groups at lunch time has been considered.

8. (A) MONITORING AND EVALUATION

1. Baseline data to which all subsequent data will be compared will be generated through the initial PRA.
2. SASOL field staff will monitor and produce a progress report on monthly basis to SIDA.
3. SIDA will inspect work in progress and accounts according to their schedule.

8.(B) EVALUATION

1. A mid-phase evaluation is planned after every six months. This will be carried out with the community, SASOL field staff and directors with external help from a PRA trainer.
2. After one year an evaluation involving SIDA, SASOL and community will be undertaken.
3. At the end of each catchment development "Impact Assessment PRA" will be undertaken to assess the implications of the project in the catchment.
4. End of project evaluation will be undertaken with SIDA, SASOL and the communities.

SASOL BUDGET OUTLINE (Year 1)

<i>Item</i>	<i>Costs Year 1 (KShs)</i>
Personnel	
- SASOL staff	672,000
- Field staff	512,000
Capital items & equipment	430,000
Office running costs	118,500
Vehicle running costs	465,000
Supplies and materials	
- tools	129,530
- construction materials for 30 sand dams	1,592,400
- construction materials for 25 wells	435,500
- windlasses (25)	112,500
Training, Hygiene and sanitation education	1,069,000
Monitoring and evaluation	220,000
Nairobi office expenses	92,500
Audit fee	40,000
Subtotal	5,888,930
Community contribution	2,850,300
TOTAL Project costs	8,739,230

Note: It has been assumed that two projects of similar size will be executed in Kitui by SASOL. As a consequence we have assumed the SASOL overheads to be 50% for this project.

BUDGET DETAILS

1. PERSONNEL

	KShs.
1. Total SASOL staff costs (50% of total per year).	672,000
2. Field staff costs.	512,000
Total costs per year for the project	1,184,000

2. CAPITAL ITEMS

1. One new motorcycle (Suzuki 175 cc)	400,000
2. Fax Machine	30,000

3. OFFICE RUNNING COST.

	cost/month	cost/year
Office Accommodation	2,500	30,000
Stationary	1,500	18,000
Postage & freight	500	6,000
Telephone & cables	6,000	72,000

Water	150	1,800	
Power	350	4,200	
Insurance			5,000
Accommodation out of station	5,000	60,000	
Total		per	year
		237,000	
Total costs for this project (50%)			118,500

4. VEHICLE RUNNING COSTS

4WD Toyota, 2,000 kms per month @ KShs 35 / km * 6 months = KShs 420,000
 Motorbike, 1,000 kms per month @ KShs 7.5 / km * 6 months = KShs 45,000
 subtotal running costs KShs 465,000

5. SUPPLIES AND MATERIALS

5.1. Tools (consumables).

<i>Item</i>	<i>Unit</i>	<i>Qty</i>	<i>Unit cost</i>	<i>Total costs</i>
1. Mattock	pc	12	450	5,400
2. Mason Trowel	pc	12	270	3,240
3. Steel Trowels	pc	12	460	5,520
4. Gum boots	pr	15	650	9,750
5. Overalls	pr	30	950	28,500
6. Mtalimbo	pc	12	400	4,800
7. Cold chisel	pc	36	400	14,400
8. Saw	pc	6	560	3,360
9. Mason hammer 2kg.	pc	6	350	2,100
10. Stone hammer 5kg	pc	6	1,000	6,000
11. Karais	pc	24	250	6,000
12. Buckets	pc	12	450	5,400
13. Spirit level	pc	6	300	1,800
14. Hacksaw blades	doz	12	480	5,760
15. Wheel barrow	pc	4	2,000	8,000
16. Claw hammer	pc	12	250	3,000
17. Ropes	m	240	60	14,400
18. Measuring tape	pc	6	350	2,100
TOTAL				129,530

5.2 MATERIAL COST.

5.2.1. Unit sand dam.

<i>Item</i>	<i>Unit</i>	<i>Qty.</i>	<i>Unit cost KShs</i>	<i>Total cost KShs</i>
1. Cement bag	bag	100	450	45,000
2. Round iron bar 3/8 "	pc	6	460	2,760
3. Barbed wire G16	roll	1	2,250	2,250
4. Nails 4"	kg.	1	70	70
5. Timber 2" * 2"	ft.	100	6	600
6. Polythene sheeting	m.	30	50	1,500
7. Round bar 1/4"	pc	3	300	900
TOTAL per dam				53,080

Total per sand dam **KShs 53,080**
30 sand dams yr.1 **KShs 1,592,400**

5.2.2. Offtake well

<i>Item</i>	<i>Unit</i>	<i>Qty.</i>	<i>Unit cost KShs</i>	<i>Total cost KShs</i>
1. Cement bag	bag	20	450	9,000
2. Round iron bar 3/8 "	pc	2	460	920
3. Barbed wire G16	roll	1	2,250	2,250
4. Galvanised wire 3mm	kg	20	150	3,000
5. Polythene sheeting	m.	15	50	750
6. Ropes	m	25	60	1,500
TOTAL per well				17,420

Total per well **KShs 17,420**
Total 25 wells yr.1 **KShs 435,500**

5.2.4. Windlass.

<i>Item</i>	<i>Unit</i>	<i>Qty</i>	<i>Unit price</i>	<i>Total costs</i>
Windlass	Unit	25	4,500	112,500

6. TRAINING.

	KShs.
1. Artisan training Dam construction	60,000
2. Exchange visits, 3 trips @ Ksh 15,000 hire of vehicle (30 seater) DSA.for 30 people/trip @Ksh.200 each	45,000 18,000

3. PRA Training 40 people per sub-location for 8 days. (4 total)			
Trainer	36,000		
Transport	15,000		
DSA Trainer	11,000		
Lunches Trainees	30,000		
subtotal	92,000	@ 4 =	368,000
4. Hygiene and Sanitation Education			
Preparation of material	130,000		
Training 4 sessions (see above)	368,000		
Construction of demo latrines (10)	80,000		
subtotal	578,000		578,000
TOTAL training			KShs 1,069,000

7. MONITORING AND EVALUATION.

Yr.1	Ongoing Hydrological monitoring and Environmental analysis (Annual cost)	KShs	100,000
	Beginning - Baseline 1st River catchment - PRA overall as separate from sub-location PRA's		
	- Water use		
	- Spread		
	- Economic		
	- Terracing		
	- School attendance		
	Total for PRA itself		90,000
	write up document and collection of information		30,000
	Total yr. 1		220,000

8. OTHER COSTS

1. Nairobi Office Support Expenses.

	cost/month	cost/year
Bimonthly Board members visits		
Transport (360km. @ Ksh 25/km.	9,000	54,000
Board members expense @ 2000 per visit	2,000	12,000
Accountant visit -monthly	6,250	75,000
Accountant transport monthly	1,000	12,000
Board meeting expenses @ 5000 x 4/year		20,000
Telephones/faxes	1,000	12,000
Total year 1		185,000
Total costs for this project (50%)		92,500

2. Audit cost per year. (for this project) **KShs 40,000**

9. COMMUNITY CONTRIBUTION

1. Cash contribution	KShs	25,510
(accommodation, and upkeep of artisan, Food for community during work on site)		
2. Labour		
500 man days @ 80.00 / day		40,000
3. Material		
Stone 22 cum @ 1,000	22,000	

Sand 5 cum @ 500	2,500	
Water 20 cum @ 250	5,000	
subtotal	29,500	29,500
Total community contribution per sand dam		95,010
Total for 30 sand dams in Year 1	KShs	2,850,300

**SITES IDENTIFIED BY THE COMMUNITY FOR
DEVELOPMENT OF RIVER SAND DAMS ON THE
KISHIO / KILAWA CATCHMENT AREA.**

This catchment area is in Kaluva sub-location Nzambani location, Kyuluni Division of Kitui District.

The following sites have so far been identified by the community as suitable for the development of river sand dams, in order to increase the quantity of water held in the catchment. Additional sites will be added to this complement as confirmed and the list revised accordingly.

1. Kathungu
2. Ngelesani
3. Kalimu
4. Kwa Syanda
5. Kwa Malu
6. Kathini
7. Kwa Syolau
8. Kwa Ngoka
9. Kwa Kisovi
10. Kwa Maundu
11. Ngiluni
12. Ngungani
13. Itumba
14. Kwa Ndiki
15. Kiangini
16. Kisasi
17. Kwa Nyamai
18. Kwa Kyale
19. Kwa Mboo
20. Kwa Muthoka
21. Kwa Kinyungu

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18 April 1997.