PROJECT OBJECTIVES

To build sustainable community water supply in Ngunga Catchment, Kitui, to improve water and food security.

(A) PROJECT OUTPUTS
   (1) Construction of 40 sand dams and 25 off-take wells.
   (2) Community trained in
(a) Natural Resource Management
(b) Community Record keeping.

(B) PROJECT ACTIVITIES

1. 40 Sand Dam Construction
2. 25 Offtake Wells Construction
3. Community Training

5. DURATION OF PROJECT

   Nine months

6. TOTAL BUDGET
   Ksh. 20,159,980

7. COMMUNITY CONTRIBUTION

   Ksh. 5,260,000

8. REQUESTED FROM CDTF

    Ksh. 14,899,980

INTRODUCTION

The current drought in Kitui resulted from the failure of the 1999 long and short rains and 2000 long rains. Normally, Kitui has bimodal rains. The long rains start in late March and terminate in June. The short rains start in late October and tail off in December.

The short rains are more reliable and produce better harvests; their failure leads to food shortages. The long rains have more intensive storms but are highly unreliable. They however supply the water for people and their animals to survive the long dry period from July to October.

In view of the continued failure of the rains, over the last 2 years, the soil is perched and its water storage minimal. This has resulted in a severe shortage of water for human and livestock consumption. There has been very limited production on the land. Consequently there is a critical shortage of food for people and fodder for their animals. This has created a situation where people are selling of their animals below market prices, to avoid total loss. However, not all animals are sold. As the market for stock is flooded, many animals die before even reaching the market. Animals produce the bulk of farm incomes in Kitui. Food prices have increased due to shortages. People are being pushed into extreme poverty as the drought deepens.

In mitigation against this and subsequent droughts, it is important to introduce technologies which increase the retention of received rainfall on a catchment to increase the amount of water in the soil. Introducing such technologies would:
* Eliminate human and animal drinking water shortage in future droughts.
* Raise the water table thereby increasing the land's productive capacity.
* Facilitate the growing of tree seedling hence increasing the tree populations with all its environmental advantages.

To achieve the full potential of these water retention technologies, local communities must become managers rather than exploiters of the environment. Community education is therefore of paramount importance for it enables the communities to:
* Initiate effective natural resource management practices to increase water and soil conservation activities in the community.
* Institute situational analysis and community development planning based on appropriate record keeping for tackling prioritized problems.
* Expedite community capacity building for development leadership.

By implementing sustainable water technologies, one sets of a trend that helps nature to retain more water in the catchment. This will boost production in the ASALs whose major problem is not the absolute lack of rainfall but retention of available water. Characteristically rain falls in short intense storms. This leads not only to high rates of erosion but also to water being lost from ASALs through furious flash floods. This is the basic reason for the institution of water retention technologies. When the rain fails, these water retention technologies would be a reserve, which would reduce the impact of droughts. Employed over extensive areas, the waiter retentive technologies would greatly reduce the negative effects of the frequent droughts.

3.BACKGROUND

3.1 PROJECT RATIONALE AND PAST EXPERIENCE

The SASOL River Sand Dams Program 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 realized that water could be harnessed cheaply if the proper structures are built with systematic community participation. To be able to do this, however, a river catchment should be developed in total.

The catchment approach depends on the co-operation by the community in developing sequential sand dams in their dry riverbeds coupled with terracing and tree planting on individual plots. This way there are activities for the community and individual plot owner activities. All are tied to conserving water in the catchment so as to improve production.

SASOL sand dam construction started in March 1995 with a five dam pilot project on the Kiindu river. The pilot enabled SASOL to test the initial thinking about the technology including construction techniques and community participation. 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 rise of the water level upstream and downstream of Kamumbuni sand dam, the last of the Kiindu dams. Where the scoop holes used to go down to 12ft now, after a long drought, water is found before 4 ft. This fact answers the skeptics who argued that building dams would deny downstream people water. It increases its availability.

25 sand dams followed the pilot phase on the same Kiindu river catchment. Construction of these sand dams and the associated off-take wells were completed in November 1996. We have observed this catchment for four years now. We estimate that more than 1.1 million cubic meters of water are held in the dams. This water is available for human and animal use, by 26100 people in Mulango and 8000 people in Kisasi. Extensive terracing has been carried on in this catchment. Tree planting has lagged behind due to lack of water for raising tree seedlings in the past. A series of nurseries in the community were started in 1999 and 30,000 trees have been planted.

As far as long term reliability of the technology, it is worth noting that isolated sand dams constructed in Kenya in 1940's & 50's by ALDEV are still

functional. This is proof that the technology is viable. Extraction of water from the dams combines both traditional and modern methods.

SASOL has been involved in the use of this technology for 5 years. Water Aid financed 35 dams. Out of an evaluation of these, the booklet Where There Is No Water, was published. It supported the community approach and the technical parameters of construction.

It was basically on the strength of this that funding was sought from DFID. The DFID funded component, which ended in December 1999 funded 65 dams and 50 wells. An out put to purpose review was conducted by DFID in February 1999 and the review mission concluded that, SASOL had achieved the purpose of this phase of the project, and, further , that the technology was viable, affordable and sustainable. Attached is an extract of this review.

SIDA SWEDEN has funded 70 dams and 25 wells since June 1997. They also conducted an evaluation, which concluded that the work was satisfactory and met construction, community participation and long term development needs of the assorted communities. An extract of their review is appended.

Since 1994 SIMAVI has financed 118 wells and 17 water tanks for schools. These are totally separate from the wells related to sand dams. Comments on their review are appended.

Mennonite Central Committee has financed 8 dams, which are about to be completed. No evaluation is done yet. They are also financing nurseries, which are being implemented now.

In summary then there are 180 dams associated with 75 wells in assorted rivers in the project area. There are 118 wells and 17 large water tanks in schools. Nurseries are in the process of being established.

It is SASOL wish to construct sand dams and associated offtake wells on Ngunga Catchment in Mbitini, Ikanga and Voo locations which are much drier and which have been hit by the current drought. Hence this application.

3.2 POLICIES

District Focus for Rural Development is the official policy of the GOK. Thus each District Development Committee designs its own agenda for development in the district. SASOL activities have been approved by the DDC systems at the village, location, division and district level.

The current Kitui District Development Plan stipulate among its main objectives, two concerns 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.

SASOL initial project area was an area of 600sqkm of the 24000 sq. km of Kitui District. This covered Central and Kyuluni Divisions of the district.. The area was selected to cover the high population density areas, to get terrain variability so as to test construction methods and to get different soil types so as to test dam stability. This we have done now. The urgent need is to service the much drier areas where availability of water and community people for construction will be a central challenge.

The main SASOL policy has always been to shorten the distances family had to move to water, to a maximum of 2km compared to the more than 10km, on average, women and children were walking to fetch water. In this sense then the primary beneficiaries of the project are women and children.

3.3 PROJECT APPROACH

In the ASALs there always is an acute shortage of water in the dry season and during droughts. There are two rainy seasons in Kitui. The first rains occur from April to June and the second rains from November to December. Variability and unreliability characterize the rains. One in three rainy seasons is a total failure. In the long dry periods the communities experience acute shortage of water.

The few sources are far apart and unreliable. People and animals travel long distances to the water sources. Since seepage is slow, there are long waiting hours at the water sources to draw enough water. Typically, women spend from 4 to 10 hours to get 20 liters if they do not have a donkey.

Many technologies have been tried to supply water to the communities in these dry periods. Boreholes are expensive to install; they are extractive and not sustainable. Shallow wells also offer an extractive technology, which is not sustainable. Water tanks are expensive and limited by size. Earth dams suffer from extensive losses due to evaporation; they also have a high contamination potential and are risks to health.

SASOL evaluated these technologies and selected sand dams for they have superior attributes. In the sand dam technology, to facilitate ground water storage and recharge, water is stored below the sand thereby reducing evaporative losses whilst recharging bordering land. Sand filtration reduces contamination. Coupled with wells, there is dramatic improvement in the quality of available water.

The SASOL uses the Catchment Development Approach for project implementation. Construction of sand dams is the base on which the community stands on to build other things. Sand dams retain water, which flows down the ephemeral river. After dam construction, for continual supply throughout the seasons, runoff and deep percolation should be facilitated on the catchment land. Land terracing is the first step in slowing floodwaters and allowing percolation. In holding water for percolation on the land, the growing season is extended by increasing the effective moisture on the land. After the sand dams are charged and water availability assured, tree seedlings can be raised and reforestation started.

SASOL projects are community driven. The community selects the sites in accordance with user suitability and their knowledge of the area. Then, together with SASOL staff, the technical suitability of a site is assessed. Each agreed site then elects a site committee, which will supervise the implementation, operation and maintenance of the dam and well. The community mobilizes for the collection of local materials (stones and water mainly), labor, storage of external material and maintenance of artisan at site.

Using participatory methodologies, SASOL trains communities on how to organize their knowledge, establish records, and fill in gaps in community knowledge by seeking it outside the community. SASOL also brings in new ideas, knowledge and information to the training. Major areas of concern are in record maintenance, leadership, and community organization and natural resource management.

3.4 PROJECT DESCRIPTION

The Project Goal: To sustainably increase community water supply in dry areas of Kitui. This will be achieved by increasing the number of reliable water supply points during drought years from one to 40 in the Ngunga Catchment.

Project Purpose: To increase the retention of water in the dry river bed sands for use by the community. The technology exists to retain the water, which passes through these seasonal rivers for use in the time of adversity. With external support, the community can effectively utilize local materials and their labor to increase the number of reliable water points. The construction of these water points will release labor for other productive activities, mainly in agriculture and natural resource protection thereby improving their food security and health.

PROJECT OUTPUTS

1. Forty (40) sand dams, a sustainable water harvesting technology in ASALs, constructed used and adopted in Ngunga Catchment in Kitui.
2. Twenty-five (25) offtake wells will be constructed.
3. Community will be trained in catchment environmental management. Construction of sand dams in the river channels is the first step towards retention of water in the catchment. The second step is to control runoff on the land using terracing. The third step is to increase ground vegetative cover. This can go in two stages, one being the protection and maintenance of existing vegetation, which would be followed by additional new trees when the water base stabilizes.
4. Participatory Planning and Monitoring Evaluation system will be started. Records are important in developing a community. Collection of Community Baseline Data will enable the community to establish a base against which the community can measure its progress. It can fill gaps it identifies during development needs analysis. During the life of the project the community will maintain a record of the investment they are making. This data will be used at the end of the project when a Participatory Project Appraisal will enable the community to catalogue their achievements and assess changes brought about by the project. A Post Project Impact Assessment will enable the community to analyze the effect of the changes occurring as a result of the project. This will act as a spur to future planning of community development activities even without a donor as shown in other catchments.
5. Institutional strengthening of SASOL. To provide equipment and skills in areas which will enable SASOL to serve communities in the drier areas better. Among these is transport. Staff will be increased and trained. One area of concern is hygiene and sanitation where we aim to acquire skills on Primary Health and Sanitation Training.

PROJECT ACTIVITIES

The main activities of the project are:
1. Community organization.
2. Training to empower the community to:
(a) Improve local leadership.
(b) Manage their environment.
(c) Establish and maintain meaningful community records for analysis of development needs, planning and evaluating prioritized activities.
(d) Institute effective hygiene and sanitation measures in the community.
(e) Plan community development activities effectively.
3. Construction
(a) Identify suitable dam sites to serve the community effectively.
(b) Formation of site committees to supervise work at site.
(c) Construction of 40 sand dams and 25 wells.

4. APPRAISALS

4.1 SOCIAL APPRAISAL

General

The major economic activity in the area is subsistence crop agriculture and livestock production. Sale of agricultural produce and livestock generate the bulk of incomes. Additional family income is generated through labor export. This 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 in the heart of Kamba country. The population is nearly wholly Kamba with a sprinkling of other immigrants working as teachers or

traders. The basic cultural organization is thus based on the Kamba tradition which has a strong Mwethya organization tenet (an informal voluntary organization which includes all members of the community irrespective of gender and/or age for communal work).

The Role Of Women In The Project

Women play a major role as collectors and 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 planning meetings, the women voice is systematically sought. Women form 80% of the construction crews. During construction on the Kiindu river, 60% of the sites developed had chair-ladies, who organized the work at the site as well as fishing for men to support their work.

Project Governance

The project is designed to give the community maximum responsibility for the project activities. The artisans working on the project are in the hands of the community, which takes responsibility for their welfare.

It is important to note that suppliers deliver material orders with delivery notes to specific site committees who sign for the materials as the recipients. Payments are made by SASOL on the strength of community certification that the materials arrived in good order. The community certifies the receipt of material in the presence of SASOL staff. The dam committees, who are responsible for their security, store all construction materials. Normally stores are established at the homestead of a trusted member of the committee or community. The chairperson or member of the site committee together with the owner of the store is responsible for all store issues. The community and the artisans keep separate store issue records. This method ensures that the community and its site committee develop a sense of ownership of the materials. It also creates 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 them. Communities collect local materials needed for construction. Normally these are stones and water. In the Ngunga catchment, a very dry area, it will be necessary to transport construction and drinking water from afar for sources are more than 10 km. away.

Since material delivered to a community is for a dam or well, it cannot be diverted into any other use without site committee authorization. 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. Also, residual material is transferred to the next site again with site committee agreement. 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 for public goods. This should eliminate the existent 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 ensures its well being.

INSTITUTIONAL APPRAISAL

The beneficiaries of the project will be 65, 696 people according to the 1989 census. They are distributed in three locations as follows.

	Mbitini	29,893
Ikanga	22,449	
Voo	13,354	
Total	65,696	

This data does not project the population additions since this census for the area is characterized by out-migration during droughts. More up to date figures will be submitted once the 1999 census figures are released officially. The populations of the locations will be the primary users of the constructed water points. However, we are confident that the population utilizing the dams will increase during drought years for the supply will attract some people from drier bordering areas. Although we have experienced as high as 50% increase in the population utilizing water in constructed catchments, the rules and regulations put into place by site committees have prevented localized desertification for they demand that water for animals is taken by donkeys from the dams.

Among the primary users, the women who together with children bear the brunt of the water collection chores will gain maximum benefits. They will spend less labor and time in water collecting. Time for fetching water would be shortened from about 6 - 12 hours in dry season to a maximum of 2 hours for those furthest for the river. No doubt this has positive impacts on their health and security. In the short run, 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 land productivity improves from the sale of vegetables and farm products coupled with water related economic activities such as brick making thus improving income.

The beneficiaries are involved right from the beginning of the project. A meeting with community leaders, through the Chiefs' Offices, which contacted SASOL, 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.

SASOL, together with community representatives, has identified the 40 sites. These are the sites where the community has agreed to develop sand dams and offtake wells. Their commitment to mobilize is demonstrated by the fact that they have already started collecting construction stones at the specific sites although it was made clear SASOL did not have money to begin construction!

The administration, Chiefs and Assistant Chiefs, plays a major role in legitimizing the rules the site committees make about construction and use of the water. They ensure that different sites committees broadly incorporate the same rules.

4.3 FINANCIAL & ECONOMIC APPRAISAL

Sand dams first and foremost bring water near to the households of ASAL communities.
This reduces the cost of transport of water dramatically. Women and children consequently spend less time and labor on water fetching chores. There is less use of donkeys and equipment for water in close proximity does not have to be brought to the homestead. People can go to the source and bathe as well as washing clothes.

The construction of sand dams has direct bearing on the cost of commercial water in the small service centers. At Mbitini town, water drawn from Mwiwe, 8km away, used to retail at Ksh. 40 for 20 liters. After sand dams construction on the adjacent Kisiio River, the price fell to Ksh. 5 for 20 liters.

Riverine agriculture, with bucket irrigation, is possible with the sand dams. This not only improves the availability of vegetables but their prices. Sand dams also introduce new crops like arrowroot and sugarcane thereby impacting on food security whilst improving incomes. Honey production has increased dramatically in the completed catchments basically because of water availability, which also supports riverine growth.

Building industry has greatly benefited with local brick making cutting out long distance transport costs. Better housing has direct impacts on health.

Communities are able to raise tree seedlings of commercial trees from water harvested in sand dams. This guarantees the communities with the technology incomes from commercial timber, fruits and building wood in the medium and long term.

Sand dam technology is retentive rather than extractive. It increases the amount of water retained in an area, which would otherwise be lost. Maintenance cost of sand dams is quite low. To date, the Uvati sand dam, built in 1957, has consumed only 5 bags of cement for its maintenance. Additional water supply has profound impacts on hygiene according to World Health Organization worldwide.

It is useful to comment on sand dams in relation to other technologies used in rural water supply. Although water tanks are also a retentive technology, they are costly and have limits on their safe sizes. A 45 cum tank in Kitui costs Ksh 90,000 as opposed to a medium sized dam, which costs Ksh 105,000 but it would retain ten times more water- 4,000 cum. Shallow wells and boreholes are expensive extractive technologies. In the ASALs, where there is limited and unpredictable precipitation as well as deep water levels, these are not sustainable if not coupled with retentive measures like preservation of water catchment areas. Depletion of the aquifers shortens the lifetime of boreholes and wells. Furthermore the cost of sinking a 100m deep borehole in Kitui is approximately Ksh. 2,000,000 and there is a tendency to become saline with time. Add to this the necessary pumps and the cost becomes prohibitive. A 15 - 20 m deep shallow well in Kitui would cost Ksh. 60,000 to construct. There is little maintenance required for the improved design shallow well when properly utilized. One has, however, to ensure that conservation on the upstream is maintained to keep the well recharged.

4.4 TECHNICAL APPRAISAL

Kenya is among the rainfall deficit countries in the world according to the report "Sustaining Water" by Population Action International (1993). The situation is especially acute in the arid and semi-arid regions of the country.

Kitui district is semi-arid and lack of water is a perennial problem. It would be sensible therefore to employ technologies, which enhance the retention of water in the catchment, rather than those, which deplete the limited water existent in the limited number of aquifers and shatter zones.

4.5 ENVIRONMENTAL APPRAISAL

The main thrust of the sand dam technology is to increase the retention of precipitation in the catchment where it is received. The direct consequence of this is increased water storage in the catchment. This would raise water table levels both on the riverbeds and the adjacent land.

Raised water table levels would lead to viability of shallow well with water nearer to the surface. Scoop holes on sandy riverbeds would be 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 would be assured.

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

A raised water table will also facilitate new colonizing plants, which could not grow before. On the other hand some non-water tolerant plants will die due to water logging. Overall however river bank cover improves thereby reducing riverbank erosion.

Through terracing, initially with labor released from water collection chores, water is held on higher grounds of the catchment for longer periods. This results in the soil remaining moist for longer periods, 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 if the catchments are properly attended to.

The availability of water will mean that tree seedlings can be grown. The non-availability of seedlings in many Kitui localities has been one of the biggest hurdles to tree planting in the past. Additionally when tree nurseries are developed in the community only desired trees are grown. Tree planting exercises then continue smoothly as all the community stands to gain by planting trees. In the constructed catchments, different dam sites have selected hedge, carving, fruit, timber and firewood species. With improving land management seedlings planted in the fields soon grow up into trees. These affect the microclimates, due to shade, lowering the temperatures in the effective area.

With a raised water table and higher ground cover, evapo-transpiration is increased. Further more increased ground cover reduces runoff, facilitating percolation and higher soil storage. This raises 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 sodality. We are watching these developments. A major study 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.

5.0 PROGRAM MANAGEMENT

5.1 Inputs

A Board of eight, four women and four men, makes SASOL policy. Six of them, four women and two men, are based in Kitui and constitute the Executive Board. They supervise and certify fieldwork for five of them have responsibilities for specific catchments. The Executive Board Chairman, who is also the Vice Chairman of the whole Board, is the Co Signatory of all the checks for payments made by SASOL in the field.

The Program staff are:

* Field Manager
* Construction Supervisor
* Administration Assistant
* Community Organizer
* Security Guard
* 16 Artisans

Envisioned Contract emergency staff for the Ngunga Program are:

* Backstop manager
* 12 contract artisans

The Budget for this project is split up as follows:

DTF contribution	14,899,980	
Community Contribution	5,260,000	
Total Project Cost.		20,159,980

5.2 MONITORING

This project is to be run on fully participatory basis. The community picks the sites for development. The community then picks the store where the external inputs are going to be delivered. It also elects a site committee, which polices the material at site, plans and manages work.

The committee establishes by laws, which have to be followed for the work at site. The committee is trained on site management. There will be 40 site committees, which later incorporate as dam committees.

Beyond the dam committee, a general gathering in the village is called , with support from provincial administration, to establish baseline data on the village situation at the beginning of the project. Follow-up of the work is made together with the village elder and the community, who sort out any problem at any particular site. At the end of the project, the Village Development Committee sits to do a Participatory Project Appraisal with SASOL.

5.3 EVALUATION

1. CDTF, the Ngunga Community and SASOL will conduct a Milestone Evaluation

2. CDTF Staff, the Ngunga Community and SASOL will conduct an end of project review.

3. CDTF are free to conduct any other reviews, audits or evaluations, as it deems necessary.

6. INVITATION FOR FIELD VISIT TO SASOL PROJECTS

SASOL welcomes the management of CDTF or its agent visit existing SASOL projects to see for themselves what has been done and the effects. It would be worthwhile to also visit the proposed area before initiation of the project.

7. TIME FRAME

This Project will be completed in 9 months from day of receipt of funds.

8. BUDGET

ItemYear 1
(Kshs).Construction cost material and Artisanal labour.
- Tools
- Materials & Artisanal labour for sand dams.
- Materials for wells
- Windlasses
240,380
6,184,800
808,750
112,500Training
- Staff,
- Exchange visits
- Community
120,000
168,000

720,000
Participatory Monitoring & Evaluation
360,000

Institutional Support
295,000
Audit Fees
60,000
Nairobi Liaison Office Expenses
81,000
Government taxes
300,000Personnel
- Sasol staff
- Insurance & Medical
- Back stopping

1,305,000
230,000
1,350,000
Capital items & equipment
1,300,000
Office running costs
370,300

Vehicle running costs
968,000
Sub-total

14,899,980
Community Contribution
5,260,000
Total Projects Costs
20,159,980

APPENDIX 1

BUDGET DETAILS

1. SUPPLIES AND MATERIALS

1.1. Tools.
ItemUnitQtyUnit costTotal costs1. Motorcycle gloves p.c.2100020002. Motorcycle suitp.c.215000300003. Mattock p.c.204509,0004. Mason Trowel p.c.202705,4005. Motorcycle helmetp.c.25000100006. Steel Trowels p.c.204609,2007. Gum boots Pr3077023,1008. Overalls Pr32950304009. Mtalimbo p.c.16400960010. Cold chisel pcs3640014,40011. Sawp.c.125606,72012. Mason hammer 2kg. p.c.123504,20013. Stone hammer 5kg p.c.121,00012,00014. Karais p.c.242508,40015. Buckets p.c.24450720016. Spirit level p.c.123003,60017. Hacksaw blades doz.124805,76018. Wheel barrow p.c.122,00024,00019. Water monitoring unit20. Claw hammer p.c.20250500021. Ropes M240601440022. Measuring tape p.c.203507200TOTAL 240,380
1.2 MATERIAL COST.

1.2.1. One sand dam.

Item	Unit	Qty.	Unit cost KShs	Total cost KShs
1. Cement	bag	bag	1505	3079,500
2. Round iron bar 3/8 "	p.c.	64	602,760	3. Barbed wire G16
roll	32,250	67504. Nails 4"	Kg.	170705. Timber 2" * 2"
ft.	10077	006. Round bar 1/4"	p.c.	624014407. Labor month
4700	028,000	8. Fooddays	427	0029,400
9. Waterjerrycan	120	056000 Total		
		154,620		

Total 40 sand dams @ Ksh. 6,184,800

1.2.2. Offtake well

Item	Unit	Qty.	Unit cost KShs	Total cost KShs
1. Cement	bag	bag	2053	0106002. Barbed wire G16
roll	12,250	2503. Galvanized wire 3mm	kg	201503,000
4. Laborm.	170	0070005. Ropes	m	25601,500
6. Water	20 l	160	608,000	Total per well
32,350 =SUM(ABOVE) µ§				
Total 25 wells			KShs 808,750	

1.2.3. Windlass.

Item	Unit	Qty	Unit price	Total costs
Windlass	Unit	254	500	112500
25 windlass				112,500

2. TRAINING.

	KShs.
1. Artisan training	
Dam construction and community management	120,000
2.Exchange visits,	
4 Exchange visits @ 42000 each	168,000
4. 8 Participatory workshops training 40 people per sub-location	
Training fee 90,000 per training	720,000
Total	1,008,000

3. MONITORING AND EVALUATION.

Participatory Monitoring & Evaluation	360,000
Total	360,000

4. OTHER COSTS

4.1.Instititutional Support.

Monthly Board members field Visits			
Transport (360km. @Ksh 25/km.)		9,000	81,000
Board members' expense @ 2000 / visit		18,000	
Visit			
Accountant visit -monthly	9,250	83,250	
Accountant transport monthly	1,000		9,000
Board meeting expenses @ 5000			
Per meeting 4 meeting per year	10,000	30,000	
Total		221,250	
4.2 Audit cost per year		60,000	
5. Government taxes		300,000	

6. Nairobi Representation Expenses.

		Cost/m	Cost/Year
Telephones/faxes	4000	36000	
Stationery	1000		9,000
Transport	4000		36,000
Total		81,000	

7. PERSONNEL COSTS

	KShs.
1. SASOL staff costs	1,305,000
2. Medical	185,000
3. Insurance	45,000
4. Backstopping staff	1,350,000
Total	2,885,000

8. CAPITAL ITEMS

1. 1 Motorcycle	300,000
2. 1 used land cruiser	1,000,000
Total	1,300,000

9. OFFICE RUNNING COST.

	cost/month	cost/year	
Office Accommodation	3,500	42,000	
Stationary	1,800	21,600	
Postage & freight	700	8,400	
Telephone & cables	9,000		108,000
Water	150	1,800	
Power	350	4,200	
Housekeeping	2,600	31,200	
Insurance			
12,000			
Accommodation out of station	5,000	60,000	
Meals	4,500		54,000
E-mail service	2,300	27,600	
Total	370,800		

10. TRAVEL.

10.1. Vehicle Running cost

	Cost/m	Cost/y

Fuel and lubricants	25,000		225,000
Service & repair	50,000		450,000
Tires Vehicle & Motorcycles			160,000
Insurance & Licenses			133,000
Total			968,000

11. COMMUNITY CONTRIBUTION

(A) Construction material			
Stone 22 Cum @ 1000/=per Cum	22000		
Sand 5 Cum @ 500/= per Cum	2500		
Water 20 Cum @ 250/= per Cum	5000		
Subtotal		29,500	
(B) Labor			
Trenching			
Well shaft			
Artisan help			
Material shifting			
900 person days @ 100/= per day			90,000
(C) Subsistence			
Artisan accommodation & upkeep			
60 days @ 200per day			12,000
Total per site			131,500
TOTAL COST 40 Sites		5,260,000	