

824 KEKI89

Danida

**KENYA**

**KITUI INTEGRATED DEVELOPMENT PROGRAMME**

**FOR ARID AND SEMI-ARID LANDS**

LIBRARY  
INTERNATIONAL REFERENCE CENTRE  
FOR COMMUNITY WATER SUPPLY AND  
SANITATION (IRC)

**PLAN OF OPERATIONS**

**PHASE I**

**VOLUME II**

**NATURAL RESOURCE CONSERVATION**

**AND DEVELOPMENT**

September 1989

Danish International  
Development Agency

Ministry of Reclamation and  
Development of Arid, Semi-  
Arid and Wastelands

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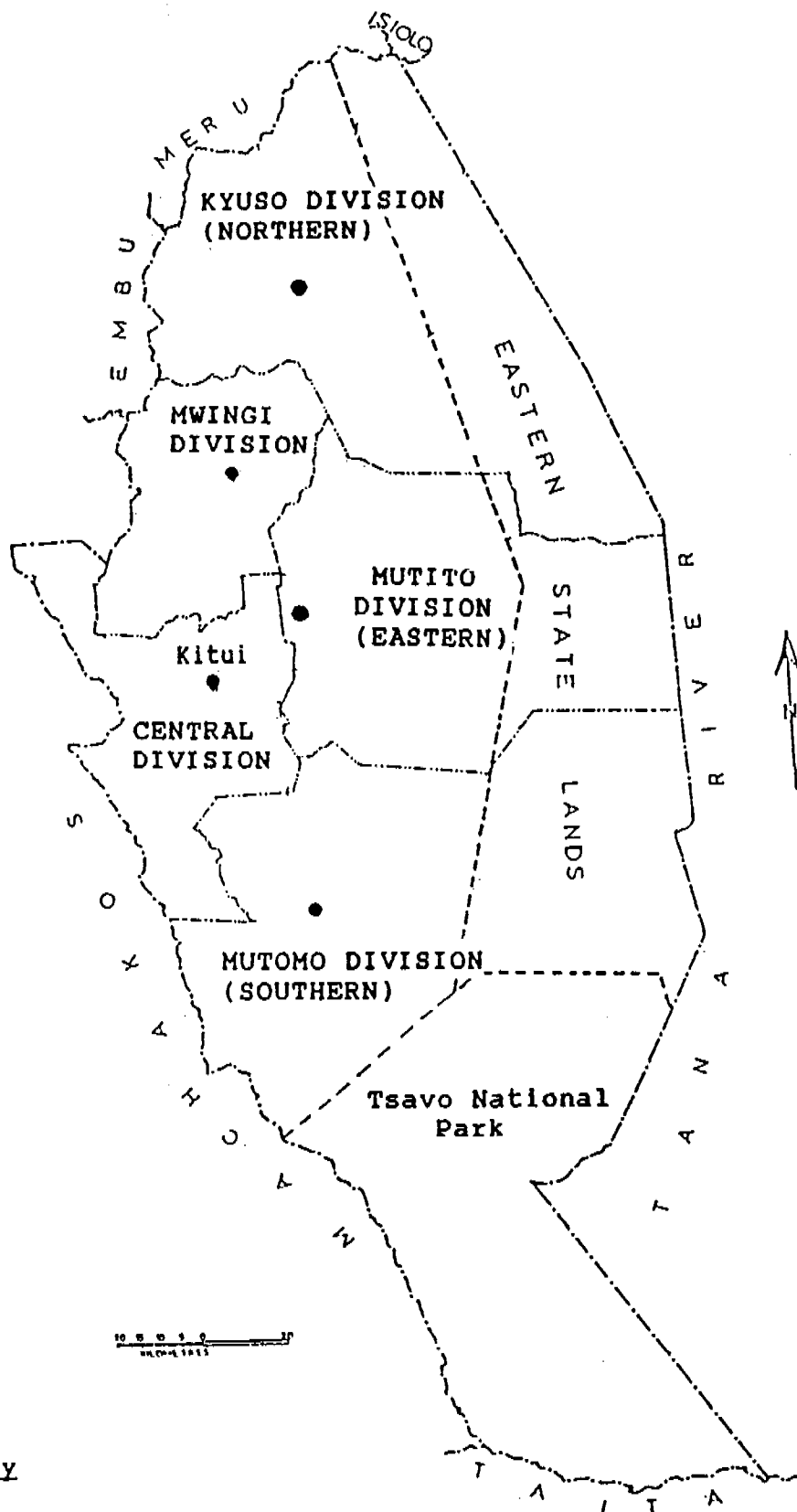
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Map 1: Location of Kitui District



Map 2: Kitui District -  
Administrative Boundaries



Key

- District Boundary
- Division Boundary
- Division Centre

## ACRONYMS AND ABBREVIATIONS

AAPO	Assistant Animal Production Officer
ACS	Assistant Construction Supervisor
AE	Adult Education
A-in-A	Appropriation-in-Aid
AHA	Animal Health Assistant
AI	Artificial Insemination
AIE	Authority to Incur Expenditure
ALDEV	African Land Development Organisation
ARO	Assistant Range Officer
ASAL	Arid and Semi-Arid Lands
ATO	Assistant Training Officer
bgl	below ground level
BLI	Better Living Institute
CBPP	Contagious Bovine Pleuro-pneumonia
CCPP	Contagious Caprine Pleuro-pneumonia
CDA	Community Development Assistant
CET	Community Education and Training
CETS	Community Education and Training Section
CF	Conservator of Forests
CPR	Common Property Rights
DAdEO	District Adult Education Officer
DAEO	Divisional Agricultural Extension Officer
DAO	District Agricultural Officer
DAPO	District Animal Production Officer
DC	District Commissioner
DDC	District Development Committee
DDO	District Development Officer
DEC	District Executive Committee
DFEO	District Forestry Extension Officer
DFO	District Forestry Officer
DLEO	District Livestock Extension Officer
DLMO	District Livestock Marketing Officer
DLO	District Livestock Officer
DLPO	District Livestock Production Officer
DPO	District Programme Officer
DPU	District Planning Unit
DRO	District Range Officer
DRP	District Range Planner
DSDO	District Social Development Officer
DSO	District Statistical Officer
DTB	District Tender Board
DWE	District Water Engineer
Dv/Div	Divisional
Div.FEO	Divisional Forestry Extension Officer
DvSCO	Divisional Soil Conservation Officer
DVO	District Veterinary Officer
E/GT	Extended Ground Storage Tank
E/DM	Earth Dam
E/DS	Small Earth Dam

FY	Financial Year
GASP	Goat and Sheep Project
GOK	Government of Kenya
G/T	Ground Tank
GWD	Groundwater Dam
ha	hectare
HQ	Headquarters
H&S	Hides and Skins
H&SI	Hides and Skins Inspector
IMMC	Inter-Ministerial Coordinating Committee
JP	Joint Project
JTA	Junior Technical Assistant
KANU	Kenya African National Union
KIDP	Kitui Integrated Development Programme
KGGCU	Kenya Grain Growers Cooperative Union
km	kilometre
KREMU	Kenya Rangeland Ecological Monitoring Unit
KTB	Kenya Top Bar (Hive)
KWIFT	Kenya Women's Finance Trust Ltd
LDC	Locational Development Committee
LDO	Livestock Development Officer
LEO	Locational Extension Officer
LPO	Local Purchase Order
lps	litres per second
LSD	Local Service Order
LWB	Long Wheel Base
MENR	Ministry of Environment and Natural Resources
MIDP	Machakos Integrated Development Programme
MOA	Ministry of Agriculture
MOALD	Ministry of Agriculture and Livestock Development (now divided into MOA and MOLD)
MOCSS	Ministry of Culture and Social Services
MOF	Ministry of Finance
MOH	Ministry of Health
MOLD	Ministry of Livestock Development
MOPND	Ministry of Planning and National Development
MOWD	Ministry of Water Development
MRDASAW	Ministry of Reclamation and Development of Arid, Semi-Arid and Wastelands
MSWCP	Mutomo Soil and Water Conservation Project
NEP	National Extension Project
NGO	Non-Governmental Organisation
OHP	Overhead Projector



PC	Programme Coordinator/Personal Computer
PMU	Programme Management Unit
PO	Programme Officer (or Post Office)
PSC	Programme Steering Committee
PY	Programme Year
RAES	Rural Afforestation Extension Service
R/C	Rock Catchment
RDF	Rural Development Fund
RO	Range Officer
RRA	Rapid Rural Appraisal
S&M	Survey and Monitoring
SC	Soil Conservation
SCO	Soil Conservation Officer
S/D	Sand Dam
SDA	Social Development Assistant
SIDA	Swedish International Development Authority
SLDC	Sub-Local Development Committee
SMA	Survey and Monitoring Assistant
SMO	Survey and Monitoring Officer
SMS	Survey and Monitoring Section
S/P	Spring Protection
SSC	Site Survey Consultant
SS/D	Subsurface Dam
STO	Senior Training Officer
S/W	Shallow Well
SWB	Short Wheel Base
SWCB	Soil and Water Conservation Branch
SWE	Senior Water Engineer
TA	Technical Assistant (MOA field staff)
TARDA	Tana and Athi River Development Authority
TO	Technical Officer
TOT	Training of Trainers
TRA	Technical Range Assistant
TTAP	Taita-Taveta ASAL Programme
T&V	Training and Visit (extension system)
USAID	United States Agency for International Development
VO	Veterinary Officer
WPCU	Water Programme Coordination Unit
W/S	Water Supply

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## CHAPTER 6

### SOIL AND WATER CONSERVATION AND CROP DEVELOPMENT

#### Objectives

- 6.1 The objectives of this component of KIDP are as follows:
- to encourage farmers to develop sustainable cropping systems through the adoption of techniques which will reduce soil erosion and the loss of water and plant nutrients from their land;
  - to help farmers build and maintain simple, local water conservation structures for domestic and livestock use;
  - to improve the capacity of the field extension service of the Ministry of Agriculture to respond to the increasing need of farmers for advice and assistance with conservation farming throughout the District.

#### Existing Resources

##### *Extension Staff*

6.2 The availability of frontline staff is summarized in Table 6.1. A detailed breakdown is given in Appendix 6A.

6.3 The MOA aims to provide one professionally qualified TA for every Sub-Location. Currently there are 157 frontline staff (Location and Sub-Location) drawn from TD, TA and JTA grades. JTAs are gradually being phased out and replaced by properly trained TAs.

6.4 Table 6.1, which shows the deployment of MOA frontline staff (Locational and Sub-Locational), indicates an overall coverage of one extension worker to about 500 farm families (the Kenya norm). Central and Mwingi Divisions have the highest density of staff per unit area, but a lower ratio of staff per family than Mutomo and Kyuso, where extension workers have fewer farm families to visit, but at least twice the area to cover. Kyuso Division is clearly the most thinly supplied with TAs (one per 1376 farm families and one per 598 square kilometres). None are posted below the Locational level because of the low potential for crop production and the remote and difficult living conditions for field staff, especially without transport.

TABLE 6.1: MOA PROFESSIONAL STAFF DEPLOYMENT  
IN KITUI DISTRICT

	DISTRICT LEVEL			DIVISIONAL LEVEL			LOCATIONAL LEVEL			SUBLOCATN'L LEVEL		FTLINE STAFF/FF	FTLINE STAFF/Km <sup>2</sup>	LRs	MCs
	AO	TO	TA	AO	TO	TA	TO	TA	JTA	TA	JTA				
DISTRICT LEVEL	8	8	6											3	0
Area km <sup>2</sup> : 20,064															
Rural Pop. 1990: 695,000															
Farm families: 86,900															
CENTRAL DIVISION				2	3	2	7	1	0	25	21	1:482	1:33	0	6
Area km <sup>2</sup> : 2,031															
Rural Pop. 1990: 235,000															
Farm families: 29,420															
MWINGI DIVISION				1	3	3	4	0	0	15	7	1:790	1:75	0	5
Area km <sup>2</sup> : 1,947															
Rural Pop. 1990: 164,000															
Farm families: 20,530															
MUTOMO DIVISION				3	2	3	7	1	0	11	21 *	1:350	1:150	2	18
Area km <sup>2</sup> : 5,980															
Rural Pop. 1990: 112,000															
Farm families: 14,000															
MUTITO DIVISION				0	3	1	1	7	2	11	6	1:346	1:153	1	3
Area km <sup>2</sup> : 4,127															
Rural Pop. 1990: 74,800															
Farm families: 9,340															
KYUSO DIVISION				0	2	3	0	10	0	0	0	1:1376	1:598	0	3
Area km <sup>2</sup> : 5,979															
Rural Pop. 1990: 110,000															
Farm families: 13,760															
<b>TOTAL DEPLOYMENT</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>6</b>	<b>13</b>	<b>12</b>	<b>19</b>	<b>19</b>	<b>2</b>	<b>62</b>	<b>55</b>	<b>1:554</b>	<b>1:128</b>	<b>6</b>	<b>35</b>

LR = Landrover, MC = Motorcycle

\* Includes 15 Project JTAs.

Source: land areas and population data from Kitui District Development Plan 1989-93; information on MOA staff deployment from MOA Annual Report for 1988, Kitui.

6.5 Mutomo Division, which currently has 31 TAs/JTAs, one in each Location, will lose 15 JTAs<sup>[1]</sup> by the end of PY2 when all Danida project-paid JTAs are due to be phased out. The degree of disruption to the extension programme will be dependent on the speed with which MDA employees can be substituted. Mutomo is also favoured by the relatively large number of professionally qualified officers (7 TOs) working at Divisional level.

6.6 The National Extension Project covers 24 Locations and 87 Sub-Locations in the higher potential areas for crop production.

6.7 A Soil and Water Conservation Officer (Technical Officer level) and two Soil Conservation Assistants are currently assigned to each Divisional office.

#### *Transport*

6.8 The deployment of the serviceable field cars and motorbikes is also shown in Table 6.1. At the end of May 1989 there was only one field vehicle at Divisional level (other than Mutomo) and only three at HQ. Details are contained in Appendix 6B. Until recently, SIDA has supplied motorbikes to Divisional SCOs, but intends to withdraw its support following Danida's involvement at District level. Mutomo is by far the best supplied, with 18 motorbikes currently used by frontline extension staff, more than the number available in the rest of the District.

#### *Budgetary Resources*

6.9 The breakdown of the GOK Recurrent Budget for the MDA Kitui for 1988/89 is shown in Table 6.2.

6.10 Annual recurrent resources amount to Ksh 1.57 million in 1988/89 (excluding salaries). The Development Budget totalled Ksh 3.58 million over the same period.

6.11 The SIDA Soil and Water Conservation Project (Ksh 1.8 million) and the National Extension Programme (Ksh 1.3 million) were the most significant items. The former is to be terminated in the coming financial year in anticipation of Danida's involvement in soil conservation at District level.

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[1] Another 2 JTAs are currently on Danida-paid study leave.

TABLE 6.2 MOA KITUI DISTRICT BUDGET 1988/89

MOA DEVELOPMENT BUDGET 1988/89

	'000Ksh
1. BLI - Farm Development	242.76
2. National Extension Programme	1301.16
3. Crop Protection	133.00
4. Smallholder Coffee Improvement	7.12
5. Soil & Water Conservation	1789.80
6. Smallholder Mech. Project	107.68
<b>Total</b>	<b>3581.52</b>

Breakdown of Development Budget under above headings

	1	2	3	4	5	6	Total
BLI Farm Development	242.76						242.76
Transport		623.36	124.00	2.00	270.00	8.80	1028.16
Travelling & accommodation		413.36	9.00	1.44	170.00	9.80	603.60
Bicycle Allowance		43.72					43.72
Farm Inputs		13.84					13.84
Training		178.28		3.68	240.00	2.80	424.76
Purchase of Stationery		4.56					4.56
Miscellaneous		9.04				6.28	15.32
Population Education		15.00					15.00
Hire of Transport and Plant					60.00		60.00
Maintenance of Plant and Machinery					28.00	20.00	48.00
Maintenance and Rehab. of SC					395.80		395.80
Maintenance of Station					30.00	60.00	90.00
Soil Conservation Works					596.00		596.00
<b>Totals</b>	<b>242.76</b>	<b>1301.16</b>	<b>133.00</b>	<b>7.12</b>	<b>1789.80</b>	<b>107.68</b>	<b>3581.52</b>

(cont....)

TABLE 6.2 (CONT.)

## MOA RECURRENT BUDGET 1988/89

	'000Ksh
1. District HQ	72.06
2. District Farm Management	152.38
3. BLI (Electricity & Water)	15.00
4. Agric. Mech. Services	493.72
5. District Land Res. Dev.	85.60
6. District Agric. Extension. Ser.	327.08
7. Crop Production	387.60
8. Agricultural Boards	39.60
<b>Total</b>	<b>1573.04</b>

## Breakdown of Recurrent Budget under above headings

	1	2	3	4	5	6	7	8	Total
Passage and leave	15.12			36.00	41.20	128.56	54.16		275.04
Transport	17.06			70.00	14.00		68.56		169.62
Travel and accommodation	12.18			90.28	14.00	93.88	53.92	39.60	303.86
Post and telecommunication	2.92			0.24		5.60			8.76
Telephone expenses	12.16			7.00		20.92			40.08
Electricity and water	2.42		15.00	3.00		2.84	6.4		29.66
Uniforms and clothing	3.66			24.00	4.40	40.08	20.4		92.54
Purchase of stationery	1.44			2.00		1.80			5.24
Miscellaneous	0.74			3.20	1.20	5.96	5.38		16.48
Maintenance of plant and equipment	1.92			230.00	8.00	0.72			240.64
Maintenance of station	2.44	19.50		28.00	0.80	8.84	18.78		78.36
Advertising and publicity		132.88							132.88
HQ Admin. Services									0.00
Training					2.00				2.00
Bicycle allowance						11.36			11.36
Farm inputs						6.52	160		166.52
Farm development									
<b>Totals</b>	<b>72.06</b>	<b>152.38</b>	<b>15.00</b>	<b>493.72</b>	<b>85.60</b>	<b>327.08</b>	<b>387.60</b>	<b>39.60</b>	<b>1573.04</b>

6.12 It is worth noting that the anticipated recurrent expenditure under KIDP for soil conservation and extension in 1990/91, amounts to Ksh 5.95 million, which doubles the MDA operating budget. This excludes the KIDP allocation under water conservation, which amounts to another Ksh 3 million.

## Soil Conservation

### *Rationale*

6.13 The scarcity of land in Kitui District is increasingly reflected in the desire of farmers to enclose holdings and to invest in soil conservation measures on their land. Over the last two decades, great strides have been made in introducing physical, cultural and biological conservation techniques. Although much has already been achieved in Kitui District, large areas of land are still cultivated without the necessary measures to reduce erosion.

6.14 Organised soil conservation works reported in the MDA Annual Report for 1988 cover no more than 2000 ha annually. However, some 3000 to 3500 ha of arable land are required every year to accommodate the growing population of the District. This expansion is occurring in areas which are either too steep or too dry for sustained crop production, both in the densely populated, more humid, upland areas of Central and Mwingi Divisions and the more arid, lowland areas of Kyuso, Mutito and Mutomo. The MDA is required to devote more and more resources to advising farmers on how to intensify production in the traditionally productive areas as well as how to gain a livelihood from the more marginal land without destroying its productive potential.

6.15 Soil conservation work in the District is mainly carried out by organised mwethya groups. These self-help groups have an average membership of 25-30, mainly women. Since the suspension of the USAID ASAL project, the supply of tools for mwethya groups in the District has markedly decreased and this has resulted in a decline in the output of soil conservation works in all Divisions except Mutomo where productivity has been maintained with Danida support.

6.16 At the same time as the cutback in the supply of incentives for groups, there has been a marked decrease in the availability of operating funds for the Ministry of Agriculture staff, particularly for transport which is necessary for routine supervision and technical back-up of frontline staff. Mutomo Division has been an exception; transport and operating expenses have not been a constraint and extension staff have been able to carry out their work without delays caused by the non-arrival of funds.

6.17 The justification for extending assistance to soil conservation and extension in the District under KIDP is based on the experience of the Mutomo Soil and Water Conservation Project. Between 1982 and 1989, Danida support in the form of capital equipment, buildings, etc. and operating costs for routine extension work, as well as the provision of incentives to self-help groups, has done much to increase the progress of soil conservation in the Division and raise the morale of MOA staff assigned to the project.<sup>[2]</sup>

#### Target Group

6.18 Danida's assistance to the ASAL programmes in Kenya is primarily aimed at the drier, more marginal parts of the two Districts involved and the resource-poor households. However, within Kitui District, it is the more humid, upland Divisions where soil erosion is the greatest threat and where the majority of the population are concentrated. Furthermore, soil and water conservation work will be most effective if all households within a catchment participate. If some fields are left out, the possibility of further soil erosion remains. By encouraging all households to take part in conservation work the poorer households are less likely to be excluded.

#### *Geographical Priorities*

6.19 MOA will commence KIDP-supported soil conservation work throughout the District as soon the necessary resources can be made available by KIDP. However, it will be necessary to draw up plans for each Location, in close cooperation with the Locational and Sub-Locational Development Committees. Where appropriate, this work will be coordinated with that of the water supply, range rehabilitation and forestry sectors of KIDP.

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[2] See Evaluation Report prepared by a joint Danida/GOK Mission, December 1987 (Banda ref. No.104.Ken.89).



**Soil Conservation Outputs**

6.20 Soil Conservation<sup>[3]</sup> will be promoted both through:

- (a) Extension: within the context of the National Extension Project, the provision of advice to farmers on land management and crop husbandry: e.g.

Season	Possible extension advice
land preparation	- promote unploughed strips - plough across the slope - river bank reserves
planting	- adequate plant population - intercropping - application of fertilizer and manures - selection of good seed - plant across the slope - mulching
weeding	- weed across the slope
harvesting	- conserve waste vegetative material for trash lines and for incorporation in the soil.

- (b) Community action: emphasis will be given to the catchment approach which involves a small focal area covering perhaps 100-200 hectares and comprising a group of farms. The aim of the catchment approach is to conserve the total area as opposed to disjointed, haphazardly laid-out conservation measures. Extension efforts will be concentrated in each area in turn while giving general extension advice in other areas as well. The community will be organized and mobilized for effective participation with the assistance of the Community Education and Training Section of KIDP (see Chapter 5).<sup>[4]</sup>

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[3] This section draws on the Plan of Operation 1989/90-1991/92, Soil and Water Conservation Project (SIDA), Agricultural Engineering Division, Soil and Water Conservation Branch, Ministry of Agriculture, Nairobi.

[4] The catchment approach, involving 100-200ha and a group of farms, is not incompatible with the adoption of a community development approach - indeed, without adopting it, little will be achieved.

- (c) Identification of the Catchment Area: soil conservation staff will develop the criteria for selecting a suitable catchment area and let the community do the selection of several areas in order of priority within each working area or Sub-Location. Thus a conservation strategy which is both technically and socially sound will be effected. Where appropriate, this work will be coordinated with that of the water supply and range rehabilitation sectors of KIDP.

The importance of catchment planning diminishes in areas with gentle slopes and where shambas are widely spaced and separated by bushland. The converse applies on intensively cultivated, densely settled steeply sloping land.

- (d) Planning and layout: a special soil conservation planning team comprising the Divisional Soil Conservation Officer and two TAs will map out or appraise the catchment area and work out a conservation plan. The two TAs, with the local TA/JTA, will lay out the lines for the proposed conservation measures. The TA/JTA will supervise the farmers implementing the recommended conservation measures and offer advice on construction and maintenance. The Divisional SCD will make regular follow-up visits to ensure correct implementation of the plan.
- (e) Conservation method: a combination of structural, biological and cultural conservation methods will be recommended and farmers encouraged to choose what is acceptable or feasible under their circumstances. A combination of methods will be encouraged. The planting of multi-purpose species for stabilizing terrace banks will be actively promoted.
- (f) Execution of the recommended measures will be the responsibility of the individual farmer. Those beyond the ability of individual farmers such as large gullies, major cut-off drains or rehabilitation of large, badly eroded areas will be handled by the affected community. Such communities will receive the necessary construction tools and technical advice from their local TA.
- (g) Range Rehabilitation: Reclamation of so-called communal grazing has not proved sustainable and, in future, rehabilitation work will focus on grazing land owned by individual farmers (about 0.4 ha per farm). Groups will be encouraged to assist members to carry out the work. Sites will be closed to grazing and reclamation will be carried out by controlling gullies, terracing, establishing grasses and agro-forestry species. Works will include: establishment of live fences, contour bunds and terracing, check dams and cut-off drains and the digging of shallow pits for tree establishment. The work will be done in close cooperation with the staff of the MOLD's Range Division which will provide seeds for fodder species and advise farmers and MOA extension staff on livestock and grazing management in the reclaimed areas.

- (h) Training: The National Soil and Water Conservation Project (SIDA) already organizes a comprehensive training programme for professional staff of the MOA, civil servants, school teachers, etc. at national and provincial level.

KIDP would support training of teachers, chiefs, group leaders and group members at Divisional level. At least four 4-day training courses a year would be conducted at Divisional HQs in close cooperation with the CETS (see Chapter 5).

At District level, KIDP would support two 5-day courses for the training of TAs at the BLI.

- (i) Physical targets: work will be carried out in cooperation with groups and in accordance with the practices recommended by the Soil and Water Conservation Branch of the Ministry of Agriculture. Physical targets for the District over the project period area are as follows:

Mutomo Division<sup>[5]</sup> (achievements 1988: 507 km; 1014 ha)

	1989/90	1990/91	1991/92	1992/93	1993/94	Total
linear (km)	400	400	300	300	200	1600
area <sup>[6]</sup> (ha)	800	800	600	600	400	3200
s'catchmts	5	5	4	4	3	21
jembes	2000	2000	1750	1750	1500	9000
shovels	1500	1500	1313	1312	1125	6750
barrows	400	400	300	300	200	1600
plough & harness	200	200	150	150	100	800

The above targets are based on assessment of the past performance under the MSWCP and the incentives currently offered to farmers.

About 20-25 per cent of the annually cultivated area (about 14,000 ha) would be conserved over the programme period. The planned annual decrease in the area to be covered is based on the assumption that the requirement for organised conservation work will decrease in line with the increasing adoption of soil conservation practices by farmers on their own initiative. The requirement for the project to provide hand tools in Mutomo

[5] The programme for 1989/90 and 1990/91 incorporates a number of activities which are specific to Mutomo Division. By PY2, these activities will either have been extended into other Divisions or have been curtailed so as to obtain a more equitable spread of KIDP activities throughout the District. Future work plans will specify additional activities in other Divisions which are consistent with the KIDP strategy.

[6] Assumes an average spacing between bunds, ditches, strips, trash lines, etc. of 20 metres.

Division is also expected to decrease. Hand tools will be distributed to groups when 0.5km (1.0ha) has been completed. Every 1km will earn a wheelbarrow and every two kilometres an ox-plough and pair of harnesses. These incentives are those currently provided to groups on the Mutomo project. They have been justified on the grounds that soil conservation makes demands on farmers' tools which have to be replaced. Care will be taken by extension staff to ensure that the offer of material incentives does not diminish the relevance of soil conservation and induce people to undertake tasks in which they have no faith.

Central Division (achievements 1988: 186km; 372ha)

	PY1	PY2	PY3	PY4	PY5	Total
linear (km)	300	600	600	600	600	2700
area (ha)	600	1200	1200	1200	1200	5400
s'catchmts	4	8	8	8	8	36
jembes	1500	3000	3000	3000	3000	13500
shovels	1125	2250	2250	2250	2250	10125
barrows	300	600	600	600	600	2700
ploughs & harnesses	150	300	300	300	300	1350

Mwingi Division (achievements 1988: 153km; 307ha)

	PY1	PY2	PY3	PY4	PY5	Total
linear (km)	200	400	400	400	400	1800
area (ha)	400	800	800	800	800	3600
s'catchmts	3	5	5	5	5	23
jembes	1000	2000	2000	2000	2000	9000
shovels	750	1500	1500	1500	1500	6750
barrows	200	400	400	400	400	1800
ploughs & harnesses	100	200	200	200	200	900

Mutito Division (achievements 1988: 120km; 240ha)

	PY1	PY2	PY3	PY4	PY5	Total
linear (km)	100	200	200	200	200	900
area (ha)	200	400	400	400	400	1800
s'catchmts	1	3	3	3	3	13
jembes	500	1000	1000	1000	1000	4500
shovels	375	750	750	750	750	3375
barrows	100	200	200	200	200	900
ploughs & harnesses	50	100	100	100	100	450

Kyuso Division (achievements 1988: 82 km; 165 ha)

	PY1	PY2	PY3	PY4	PY5	Total
linear (km)	50	100	100	100	100	450
area (ha)	100	200	200	200	200	900
s'catchmts	1	1	1	1	1	5
jembes	250	500	500	500	500	2250
shovels	187	375	375	375	375	1687
barrows	50	100	100	100	100	450
ploughs & harnesses	25	50	50	50	50	225

The above targets assume a gradual build up from PY1 (1990/91) and take account of the relative importance of cropping in the different Divisions of the District. Overall some 15 per cent of the arable area would be conserved by groups during the plan period. This would be in addition to the work carried out by individual farmers on their own land.

These targets should be reviewed annually taking account of the previous year's performance.

- (j) Semi-annual Work Plans will be prepared in November-December and in May-June in preparation for the peak periods of activity in January-February and July-September. An example of a work plan format from Danida's Taita-Taveta ASAL programme is provided in Appendix 6C.
- (k) Reporting will follow the existing MOA SWCB guidelines. The Division SCO will make monthly progress reports to the District SCO, copied to the PMU. The District will report to the PDA with a copy to Headquarters (SWCB); monthly, quarterly, half-yearly and annually.

**Agroforestry**<sup>[7]</sup>

6.21 The objective of the agroforestry programme is to encourage the planting and cultivation of trees, bushes, shrubs and grasses as measures against soil erosion, and also as a way of enhancing farm productivity and income. District-level goals for implementation include the following:

- translating the applied research work being conducted in Kitui District into an extension package and incorporating it into the routine work of the NEP;

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[7] At a meeting of the KIDP Programme Steering Committee, 26 May 1989, it was felt that nursery management was primarily the responsibility of the DFO and that MOA and MENR should reach an agreement on the rationalisation of nurseries and that KIDP should not support duplication. This issue should be reviewed by the first Annual Programming Mission.

- production of tree seedlings from the Divisional ('central') nurseries as well as from group nurseries.

(a) MOA Central Nurseries: Under KIDP, the following nurseries would be assisted to produce 50,000 seedlings per annum:

Mutomo Division: Matinga, Ikutha and Voo

Mwingi Division: Muthamo

Central: Kitho, Syokimuu

Kyuso: Usueni, Thunguthu

Mutito: Nuu and Mutito

(b) Mutomo Division, School Nurseries: 143 schools throughout the Division will be assisted by the programme to establish nurseries by the provision of materials and technical advice from extension staff and nursery foremen. This work, which is already under way (90 schools currently covered), will build up over the programme period as follows:

	PY1	PY2	PY3	PY4	PY5
seedlings ('000)	90	120	150	180	200

Each child will be encouraged to rear three shade or fruit seedlings per year in the school nursery, a sufficiently small number to be watered each day with the contents of a soda bottle. At planting-out time, two seedlings will be carried home by each pupil for establishment around the homestead. The remaining tree will be planted near the school. In addition to the educational value of the activity, the involvement of school children reduces the need to employ nursery attendants and overcomes the transport problem at planting time. Seeds (e.g. cashew nuts) will also be provided to children.

### *Soil Conservation Inputs*

6.22 Tables 2.1 - 2.2, 2.2.1 - 2.2.6 in Annex L list the budgeted items for soil conservation. The budget for PY2-5 is intended to be indicative and to be revised in the course of annual programming and budgeting exercises, scheduled to take place in March each year.

6.23 Operating costs in PY1 have been budgeted at 50 per cent of subsequent years in anticipation of a gradual start up.

6.24 At District level, KIDP will provide transport for supervision (a vehicle each for the DAD and SCD) and operating costs for up to 30,000 km per vehicle per year. Per diems are budgeted at 60 days per person per year. Incremental office operating costs will also be covered to the sum of Ksh 12,000 per year. A provision is made for 300 training days (@ Ksh 200 per person-day) at the BLI.

6.25 At Divisional level, the Div. SCO and 2 TAs (SC) and all LEOs will be provided with motorcycles and operating costs. TAs and JTAs will receive bicycles. A provision for hand tools (Nairobi prices) is included for each Division on the basis of planned physical targets. The MOA Divisional nurseries will be supported by KIDP up to Ksh 50,000 per annum for materials and casual labour. Each Division has been allocated 120 person-days (@ Ksh 150 per person-day) for training chiefs, group leaders, etc.

6.26 At Mwingi, Kyuso and Mutito, an office (22 square metres) and store (12 square metres) will be provided for the Div. SCO in the KIDP office complex to be constructed in PY1.

#### *Soil Conservation Inputs for Mutomo*

6.27 Initially Mutomo Division has a higher allocation of operating funds than other Divisions. However, no new capital expenditure is envisaged until 1991/92, when motorbikes and bicycles will be replaced according to the norms prevailing in other Divisions.

6.28 Other inputs planned specifically for Mutomo and relating to the winding up of the MSWCP are as follows:

- (a) Vehicle operating costs (incl. drivers) for the existing SCO fleet (see Table 2.2.6, Annex L) up to end of 1990/91.
- (b) 15 project-paid JTAs, to be phased out over 3 years: 15:10:5.
- (c) 2 project-paid animal traction trainers until end of 1990/91.
- (d) 3 nursery foremen until the end of 1990/91; 12 nursery attendants to be phased out by end of 1990/91.
- (e) School nursery programme to continue indefinitely; KIDP to provide tools, materials and seeds.

#### **Crop Development**

6.29 Training and Visit (T&V), an extension management procedure introduced to Kitui District in 1985 under the World Bank National Extension Project, is encountering problems. Too often contact farmers fail to turn up at the time of the scheduled visit and attendance by 'follow-up' farmers is poor. Repeated doses of the extension message are tedious for all concerned. It has proved difficult to schedule routine training in semi-arid areas because of the unreliability of rainfall and uncertainty attached to the timing of various operations in the farming calendar. Logistics are made difficult by the scattered homesteads and the low density of farms in many low-lying Locations.

- 6.30 It is necessary to breathe new life into the T&V system, by:
- improving the reliability of transport and the flow of funds to support training, crop demonstrations on farmers fields, scheduled visits, supervisions, etc.
  - placing more emphasis on contact groups rather than contact farmers and linking the crop extension programme more closely to the soil conservation and agroforestry work with mwethya groups;
  - improving practical training of extension staff (method and result demonstrations) so that they can awaken and maintain the interest of farmers and convince them of the relevance of what extension staff have to offer;
  - improving the relevance and technical content of specific aspects of the extension message by pooling the knowledge of subject matter specialists (professional groups) at monthly workshops in the District HQ and imparting this information to TAs during routine training sessions at Divisional level;
  - increasing the scope of the conservation advice by including subject matter specialists from MOLD (Range and Animal Production) and the RAES (Agroforestry) in the monthly training workshops.

#### *Crop Development Outputs*

6.31 Specific aspects of the crop development programme of the MOA to be supported by KIDP are as follows:

- (a) Demonstrations: Each field extension worker will organise three method/result demonstrations per season per working area on farmers' land. KIDP will provide insecticides and recommended seeds (e.g. Katumani and Makueni maize, sorghum, cowpeas, green grams, pigeon peas) obtained from Katumani and bulked on Divisional farms (e.g. Itumba farm in Mutomo Division, BLI in Central, the seed bulking plot at Mutito) or purchased from the Kitui Union, the KGGCU at Thika or Machakos. The harvested product will be distributed for seed bulking to groups who tend the demonstrations.
- (b) Field Days: In addition, extension staff will organise one field day per working area per season. A field day is organised on a farmer's land and will demonstrate a package of improved practices comprising a variety of crops and conservation techniques.
- (c) Divisional Farms:  
Itumba Farm, which covers about 7 ha and is located about 10 km from Mutomo town, will be retained as a Divisional centre for applied trials and demonstrations and a focal point for agronomic training for field staff, teachers (300 p.a.), chiefs and sub-chiefs (90 p.a.) and farmers (1000 p.a.). The farm has a meeting room for 30 people as well as catering facilities.



BLI Farm, Central Division, and Mutito Seed-Bulking Plot,  
Mutito Division: trials and demonstrations

- (d) Draught animal, Mutomo Division: KIDP will take not over responsibility from MSWCP for assistance with ox-training to groups of farmers until 1990/91. The annual target for ox-training is 64 pairs; donkeys, 50 pairs.
- (e) Seed Bulking, Mutomo Division: Due to occasional crop failures, there is a need to establish a seed bank for pulses to supply seed when it is not available locally. Improved seeds bulked on Itumba Farm will be distributed to selected farmers and/or groups who will bulk up the supply and sell the produce back to the project for storage against a future crop failure. In some years, this will not be necessary. For planning purposes, it is assumed that this will be done every third year when 45 tonnes (cowpeas 30 tonnes, sorghum 5 tonnes and green grams 10 tonnes) will be dressed and put in storage at Itumba farm. The current reserve of seed is expected to last two years. Future financial disbursement against this item will be dependent on the DAEO, Mutomo Division, presenting an acceptable project proposal incorporating the necessary agronomic and financial details of the scheme.

*Crop Development Inputs*

6.32 Tables 2.1 - 2.2, 2.2.1 - 2.2.6 in Annex L list the budgeted items for crop development. The budget for PY2-5 is intended to be indicative and to be revised in the course of annual programming and budgeting.

6.33 Operating costs for PY1 have been budgeted at 50 per cent of subsequent years in anticipation of a gradual start up.

6.34 At District level, KIDP will provide field transport for supervision (a vehicle for the Crops Officer) and operating costs up to 30,000 km per year. Sixty days per person per year have been budgeted for per diems. Incremental office operating costs will be covered up to Ksh 12,000 per year. Funds are included for 300 days training for Divisional staff at BLI.

6.35 At Divisional level, the Crops Officer will be provided with a motorcycle and operating costs up to 10,000 km per year. Materials for crop demonstrations are budgeted for each TA/JTA's working area on the following basis:

- 3 demonstrations, twice a year, 10kg of grain per demonstration and 6 kg of legume seed per demonstration;
- 1.7 kg of Dipterex and half a litre of pyrethrin per season per working area.

6.36 Funds for casual labour have been included for Central Division (BLI), Mutito (seed bulking plot) and Mutomo (Itumba) after the termination of project-paid farm labour.

6.37 Staffing: Per diems for field level staff (TOs, TAs, JTAs) are included under Soil Conservation.

#### *Crop Development Inputs, Mutomo*

6.38 Crop development inputs specific to Itumba Farm, Mutomo Division, are as follows:

- (a) 12 project-paid farm labourers phased out by end of 1990/91.
- (b) 2 farm foremen phased out by end of 1990/91.
- (c) Field days, farm inputs, etc. replaced by annual sum for casual labour for trials in 1991/92.

#### **Water Conservation**

##### *Rationale*

6.39 The strategy and rationale for the water conservation programme is described in Chapter 2 (paras 2.22 - 2.27).

##### *Water Conservation Outputs*

6.40 In the initial years of the Programme priority will be given to water conservation in Mutito and Kyuso Divisions - the more arid parts of the District. Water conservation activities will start in Mwingi and Central Divisions later in the Programme (see Appendixes 6E and 6F). These more densely populated areas require more reliable perennial supplies and will be a focus of attention in the proposed surveys of groundwater and spring development potential (see Annex F.VIII). The proposed water conservation programme (Appendixes 6E and 6F) and the choice of technology could be modified as a result of the findings of these surveys.

6.41 Rehabilitation. The Danida field survey of 269 USAID ABAL water structures constructed by MOA and MOWD (see Appendix 6D) showed that 149 schemes merit rehabilitation and completion. The immediate priority of the Water Conservation programme is to rehabilitate and complete these water conservation structures. This rehabilitation will form a significant part of the work in PY1 - PY4 (see Appendixes 6E and 6F).

6.42 Choice of Technology. Types of water conservation structure will be determined by local hydrological conditions. Where alternatives exist preference will be given to those options which can be constructed and maintained by local people.

6.43 Water conservation structures to be built under the Programme include the following:

- Spring protection (S/P), combined with an offtake pipeline and a number of tap-stations, storage tanks and cattle troughs, has already proved a workable low-cost supply system, though complicated by the difficulties of pipeline and tap-station maintenance. Siting is not a problem, but proper protection of the catchment area is very important. Few springs remain undeveloped in Kitui District, however. A survey of potential is proposed (see Annex F).
- Rock Catchments (R/C) are a preferred technology due to their simplicity. Siting should take into account community access and geological conditions.
- Extended Ground Storage Tanks (EG/T) are applied where extensive corrugated iron roofs exist (usually at schools).
- Subsurface and Sand Dams (SS/D and S/D) are a tried and tested technology. It is, however, considered necessary to carry out an evaluation study on Groundwater Dams (see Annex F) to determine their true effectiveness.
- Small Earth Dams (E/DS) take priority over medium-sized structures due to their relative cheapness and ease of operation and maintenance. A small reservoir can usually be constructed with an ox-scoop. Soil conservation measures are a pre-requisite for earth dams, otherwise rapid siltation will drastically shorten their life.
- Shallow Wells (S/W) are wells up to a depth of about 20m.

Ground Tanks (G/T) are no longer considered a viable option due to the real danger of children and smallstock falling in and of contamination. The MDH has recently put a ban on the construction of ground tanks.

In order to arrive at an estimate of the production of the different water conservation structures, an average yield figure has been allocated as follows: S/P, 20m<sup>3</sup>/day; R/C, 10m<sup>3</sup>/day; S/W, 5m<sup>3</sup>/day; EG/T, 0.5m<sup>3</sup>/day; E/D (small), 10m<sup>3</sup>/day; E/D (medium), 60m<sup>3</sup>/day; S/D and SS/D, 5m<sup>3</sup>/day.

6.44 Selection of new schemes will be done by the community following the referral system described in Box 6.1 and illustrated in Appendix 6G. The procedure should ensure that technical feasibility and social aspects are considered fully before any implementation starts.

6.45 Technical Appraisal. A Site Survey Consultant will be contracted (part time) by the PMU to work under the Senior Water Engineer of the Water Programme Coordination Unit (see Chapter 3, Volume I). The Consultant's role will be to assess the technical feasibility of sites proposed for development (new construction or rehabilitation) by the community, prior to final approval. He will also prepare bills of quantities for the proposed works and verify satisfactory completion (see Annex F.IX).

6.46 Designs. Construction methods will be standardised and will be laid down in a manual, currently under preparation by a Danida consultant.

6.47 Subcontracting of skilled works. Where an element of skilled work is required (e.g. masonry, form work, pipe work) local funds, acceptable to the local community and MOA, will be subcontracted to carry out the work. The recommended procedure is set out in Box 6.1.

6.48 Labour. To ensure the sustainability of the water conservation structure it is vital that the local community participates in its construction. The Programme will provide materials for construction, and funds for the contracting of skilled artisans and for transport, on condition that all unskilled labour is provided by the local group without charge.

6.49 Supervision of work. The Divisional SCU (under the supervision of the Divisional Agricultural Extension Officer and the technical control of the District SCU) will be responsible for supervising the distribution of materials to the site and the technical supervision of the works carried out by the local group committee, which will be responsible for the materials once they are delivered to the site. The project-paid Divisional Assistant Construction Supervisor will assist the Divisional SCU with controlling the quality of works and general coordination. However, responsibility for overall supervision of the MOA's water conservation work under KIDP at the Divisional level will lie with the Divisional SCU of MOA who will prepare quarterly and annual progress reports for the District SCU (copied to the PMU).

6.50 Training. The CETS (see Chapter 5) will coordinate training for SDAs and local water committees in operation and maintenance procedures as well as organise courses for maintenance technicians. Training courses will also be given to small contractors to help them acquire skills in bookkeeping, cost accounting, etc. On-the-job training of local artisans will be provided by the Assistant Construction Supervisor.

6.51 Planning and budgeting. A plan and budget for the following year will be prepared in March/April each year. The proposals in the Plan of Operations for PY2-5 will be revised on the basis of performance in PY1.

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[B] Erik Nissen Petersen.

**Box 6.1 - Procedure for Selecting and Building Water Points**

1. Self-help groups assisted by Community Development Assistants (CDAs) obtain approval in principle for their proposed water projects from the Sub-locational and Locational Development Committee (Sub-DDC).
2. Sub-DDCs consider the project in relation to, for example, their quota under KIDP and forward their proposals to the District Development Committee (DDC) via the Divisional Development Committee (Div-DDC).
3. The projects approved in principle by the DDC are referred to the Senior Water Engineer (SWE) in the KIDP Water Programme Coordination Unit (MPCU) for consideration in relation to policy, geographical priorities, etc.
4. Projects approved in principle by the SWE are then evaluated technically by the Site Survey Consultant (SSC). Designs and cost estimates of viable sites are forwarded by the SWE to the Project Steering Committee for final approval and for nomination of the implementing agency (MOWD or MOA). (Non-viable projects are also referred back to the DDC and back down to the Sub-DDC).
5. Tender documents for projects costing over Ksh 20,000 are prepared by the MPCU and submitted to the District Tender Board. Bids are assessed and contractors are nominated. For these projects as well as those projects valued at less than Ksh 20,000, the SWE on behalf of KIDP and the implementing ministry (MOWD or MOA) signs contracts with the appropriate contractor/artisan.
6. Meanwhile, the MPCU's Divisional Assistant Construction Supervisor (ACS), liaising with the local CDA and the field staff of the implementing ministry, ensures that the self-help group concerned forms a committee, collects and delivers the sand, stones and water to the construction site. The ACS ensures that the implementing ministry delivers the necessary construction materials to the site and informs the approved contractor to start work when the preparations are complete.
7. The water committee signs for all materials delivered to the site and keeps a daily account. The contractor/artisan is paid 10% of the contract value on starting work.
8. The ACS with the field staff of the implementing ministry inspects and approves the foundations or preliminary works. The contractor/artisan receives the second payment of 10% from the KIDP accounts section. The works are then inspected weekly and when half complete the contractor/artisan receives a further payment of 30% and a further 30% on completion.

*Water Conservation Inputs*

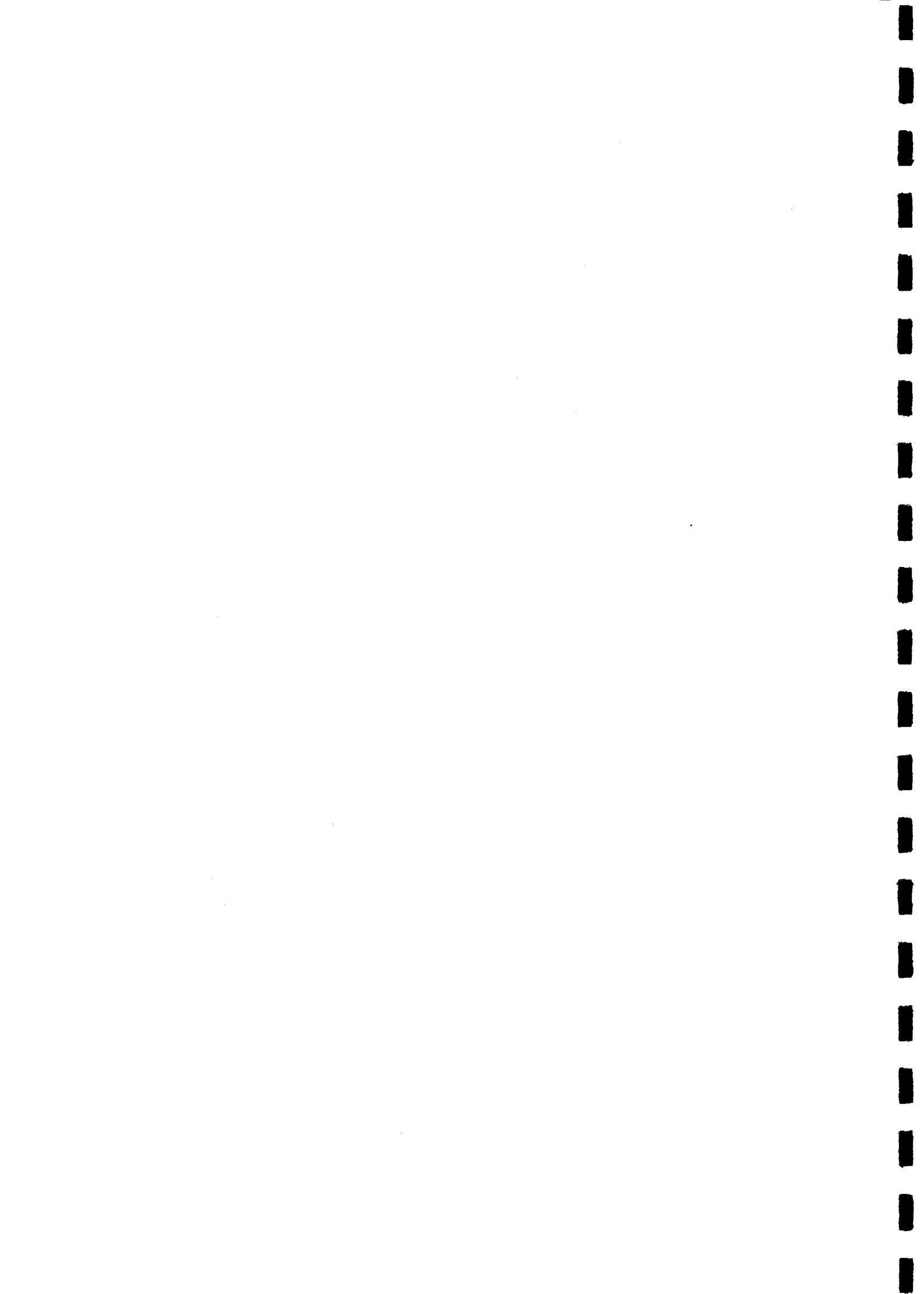
6.52 Capital costs. (See Tables 2.2.2 - 2.2.7, Annex L.) These include a materials store at Mutito, Kyuso and Mwingi. A lorry will be provided at Divisional level for the transport of cement and other building materials over long distances. Tractors and trailers (2 per Division) are intended for the haulage of construction materials over shorter distances. Concrete mixers, water bowsers and pumps etc. will also be provided, together with basic surveying equipment.

6.53 Operating costs. These include a provision for the running costs of vehicles and equipment, an allocation for materials and tools required for the construction of water conservation structures, and an annual sum for subcontracts: skilled labour and transport (ox-cart and hand-cart). Per diems for staff are included in the Soil Conservation cost tables (Tables 2.2.1 - 2.2.6).

6.54 The costs of rehabilitating and completing earlier projects will include expenditure on the following: cement, reinforcing materials, piping, skilled labour (provided by subcontractors), overhead costs for KIDP and subcontractors, and any contingencies. Transport of sand, ballast and water to the site will be done using carts (ox/donkey or hand-drawn); these are budgeted for in Tables 2.2.2 - 2.2.7, Annex L. The following items will be provided by the local groups involved in the projects, and do not need to be costed in: sand, stones, hardcore and infill, water, and unskilled labour.

6.55 Staff: MOA water conservation work funded by KIDP will be supervised by the SCD and his divisional staff who in turn will delegate authority to TOs, TAs and JTAs as appropriate.

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**APPENDIX 6A: MDA DEPLOYMENT OF FRONTLINE STAFF**

<u>Location</u>	<u>Staff</u>	<u>Sub-Locations</u>	<u>Staff</u>
<b>CENTRAL DIVISION</b>			
Changwithya	TO III	Mbusyani	TA I
		Mulutu	JTA
		Tungutu	JTA
		Mutune	JTA
		Kaveta	TA I
		Misewani	TA I
Mulango	TO III	Wikililye	TA I JTA
		Itoleka	TA II
		Kavisuni	TA II
		Kavuta	TA II
		Katulani	TA II
		Kangunga	
		Kyangwithya	TA I
Miambani	TO III	Kenze )	TA I
		Mutula)	
		Museve	JTA
		Munganga	TA I
		Nzaaya	
		Malili	
		Kasyo/Ivaini	JTA
Matinyani	TO III	Kwamutunga	TA II
		Kalimani	JTA
		Kalia	TA I
		Mutulu	JTA
		Kauma	JTA
		Kasaini	TA I
		Kalindilo	JTA
		Kithumula	JTA
Nzambani	TO III	Kaluva	TA I
		Maluma	JTA
		Ngungi	
		Kyanika "A"	TA I
		Kyanika "B"	JTA
		Ithumula	JTA



<u>Location</u>	<u>Staff</u>	<u>Sub-Locations</u>	<u>Staff</u>
Kisasi	TO III	Mosa	
		Mbitini	
		Katwala	TA I
		Kisasi/Nguuni	TA II
		Mbusyani	
		Ngiluni	
		Kitungati	TA I
		Ngangani	TA I
		Masimbini	TA I
		Katwala	TA I
Kanzau	TA I		
B2 Yatta	TA I	Kanyonyoni	
		Katoleni	
		Mwakini	
		Mikuyini	JTA
		Ilima iawe	TA I
Yatta	TO III	Ilika	TA I JTA
		Makusya	JTA
		Nyanyaa	JTA
		Syomunyu	
		Mandungo	
Kanyangi		Syomunyu	JTA
		Mandungo	JTA
MWINGI DIVISION			
Mutonguni	TO III	Kauwi	
		Mithini	TA I
		Musengo	JTA
		Kalulungo	
		Tulia	
		Kakeani	JTA
		Kaimu	TA I
		Katutu	TA I
		Ukiani	TA I
Mwingi	TO III	Mwingi	
		Kyethani	TA I
		Kiomo	
		Enziu	TA I
		Kivou	TA I (2)
		Katalwa	
		Nzeluni	JTA
Ithumba	TA I		

<u>Location</u>	<u>Staff</u>	<u>Sub-Locations</u>	<u>Staff</u>
Migwani	TO III	Nzava	
		Kanyaa	TA I
		Nzauni	TA I
		Kyamboo	JTA
		Katulani	
		Kavaini	
		Mbondoni	JTA
		Kyome	JTA
		Nzalae	TA I
		Kaliluni	TA I
		Itoloni	JTA
Endui	TO III	Mutwangombe	TA I
		Ndithi	
		Mwambui	TA I
KYUSO DIVISION			
Kyuso	TA I		
Ukasi	TA I		
Ngomeni	TA I	Ukasi	
		Kyavyuka	
		Kavuti	
		Mita misyi	
Mivukoni	TA I (2)	Kataka	
		Ngalie	
		Kauwongo	
		Kimango	
		Maseki	
		Kamula	
		Kathiani	
Katse	TA I (3)	Mutanda	
		Kakuyu	
		Ikonga	
		Konyu	
Tharaka	TA II	Katungu	
		Bakombe	
		Kanyngya	
Tseikuru	TA I	Kaivirya	
		Kasyathiuni	
		Kaningo	
		Uaueni	

<u>Location</u>	<u>Staff</u>	<u>Sub-Locations</u>	<u>Staff</u>
<b>MUTITO DIVISION</b>			
Nuu	TA I	Malawa Kyangoti Niguni Ngaani	JTA
Mui	TA I TA I (HEA)	Itiko Kitise  Ngoo Ngungi Ngiluni	TA I JTA  TA II JTA (HEO)
Zombe	TA I JTA (HEA)	Makongo Mwitiko Ngungi Thua Ngelani	JTA JTA
Endau	TA I	Katumbi Twambui Malalani Syou Ndetani Endau	TA II  JTA TA
Mutito	TO III TA I TA I JTA	Kavutei Kawala Kitoo Masasini Musukini Manyooni	   TA I TA I
Mui		Ngoo Kitise Itiko Nguluni/Ngungi	
Mutwangombe	TA I	Ngieni	TA I
<b>MUTOMO DIVISION</b>			
Ikutha	TO III	Nyoani Nzambani Ngwata Ndili Kasaala  Nzanbu	  JTA  TA I

<u>Location</u>	<u>Staff</u>	<u>Sub-Locations</u>	<u>Staff</u>
Ikanga	TO III	Kyatune	TA I
		Kathungu	
		Ithumula	TA I
		Ilusya Nyaani	TA I
Mutha	TO III	Ndakani	TA II
		Katene	
		Nguani	
		Kalia-Katune	
Mutomo	TO III	Kanelu	
		Mwala	TA I JTA
		Mibwea	
		Kamelu	TA II
Voo	TO III	Kyamatu	JTA
		Nthunguni	
		Kisasi	TA I
		Muthungue Kyanga	JTA
Mathima	TA I	Mivuni	
		Kengo	
		Kivyuni	
Kanziko	TO III	Simisi	TA I
		Kivandeni	
		Keutunda	TA I
Athi	TO III	Kalivu	TA I
		Malimu	
		Kituli	TA I



## APPENDIX 6C: SOIL CONSERVATION WORK PLAN PRO FORMA

b) Work Plan and Budget for next 6 months: (Budget figures in thousands of KSh. These generally equal those given in the Plan of Operation, July 1988)

Left 3 columns show officers responsible for each activity:

Co-ordinator  
(District-level Subject-Matter-Specialist)

Officer Responsible  
for Implementing staff } Usually Divisional Officers  
Implementing  
Officer

Mkwachunyi Catchment:			Jan	Feb	Mar	Apr	May	Jun	Target	Budget
										('000 KSh)
			-----						7	25
DSCO	DEO	SCD							14 TM's	10
									21 members	15
DSCO	DEO	SCD							45 farmers	35
DSCO	DEO	SCD								
DSCO		DSCO							100 km	60
									2 km	*30-200
DSCO	DEO	SCD							25 km	-
DSCO	DEO	SCD							100 km	-
DSCO	DEO	SCD							2,500 sdngs	50
DSCO	DEO	HO							10,000 sdngs	-
DSCO	DEO	HO							6,000 sdngs	-
DSCO	DEO	SCD								5
									Sub-total:	290-400

\* depending on community response to adopting existing structures

Mwatate Catchment:			Jan	Feb	Mar	Apr	May	Jun	Target	Budget
										('000 KSh)
DSCO	DEO	SCD	-----						6	20
DSCO	DEO	SCD							21 members	15
DSCO	DEO	SCD							600 tools	30
DSCO		DSCO							45 farmers	35
DSCO	DEO	SCD							200 km	100
DSCO	DEO	SCD							2 km	*30-200
DSCO	DEO	SCD							60 km	-
DSCO	DEO	SCD							90 km	-
DSCO	DEO	HO							6,000 sdngs	-
DSCO	DEO	SCD								60
DSCO	DEO	SCD							10,000 sdngs	-
										15
									Sub-total:	305-475

\* depending on community response to adopting existing structures

Total 6-month budget for Soil Conservation component: KSh 590,000 - 875,000



## APPENDIX 6D: ASAL WATER PROJECTS SURVEY

### Introduction

USAID funded a large number of water projects under an ASAL programme between 1982 and 1987. When the donor withdrew, many of the projects were incomplete. An evaluation of all the water projects implemented under the USAID ASAL Programme in Kitui District was undertaken by a Danida consultant in 1988/89. The consultant (Mr Erik Nissen Petersen) assessed each water project in terms of the advisability of completing, rehabilitating or abandoning it, together with a cost estimate. Out of this evaluation exercise has come the rehabilitation programme for PY1-4 within KIDP.

This summary draws extensively upon the written report submitted by Mr Petersen. For further details reference should be made to his report (June 1989).

### Classification

Following site visits and the completion of a data sheet, the sites were grouped into the following classes:

---

Class	Status	Nos
A	100% completed and functioning water projects	9
B	Diocese of Kitui completing	27
C	Danida/Mutomo WSCP completing	11
D	Other organisations completing	3
E	First priority for completion	46
F	Second priority for completion	77
G	Third priority for completion	26
H	Needing further consideration of technical/economic feasibility	32
I	Proposals for new projects	19
J	Mistakenly recorded projects	8
K	Other projects (water tanks)	11
		---
		269 <sup>[1]</sup>

---

### Project implementation

The projects were implemented by the Ministries of Agriculture (MOA), Water Development (MOWD), and Planning and National Development (MOPND) respectively.

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[1] One further project could not be located.



Structure type	Code	MOA	MOWD	MOPND	TOTAL
Rock Catchments	R/C	34	14		48
Earth Dams	E/D	42	4		46
Sand Dams	S/D	91	8		99
Subsurface Dams	SS/D	1	2		3
Shallow Wells	S/W		26		26
Spring/Pipeline	S/P	1	7		8
Boreholes	B/H		2		2
Water Tanks	W/T			37	37
<b>Total</b>		<b>169</b>	<b>63</b>	<b>37</b>	<b>269</b>

### Conclusions

149 of these projects (55%) are considered worth completing or rehabilitating, in addition to the nearly 20% that are presently being completed. These 149 form the bulk of the planned KIDP rehabilitation work for PY1-4. Projects not included (class H above, 32 projects) may be reconsidered later.

Details of ASAL water projects by Division and type are given in the table on the following page.

## Reported ASAL Projects by Type and Division/Location

Division & location	W/T	S/W	SS/D	S/D	E/D	R/C	S/P	B/H	TOTAL
<b>Mutito Division</b>									
Mui		2		1	3		1		7
Nuu		1			1	1	3		6
Mutwangombe		1							1
Nzombe		1							1
Endau		2			2	1	1		6
Mutito					3				3
<b>Total (Mutito)</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>9</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>24</b>
<b>Kyuso Division</b>									
Katse				2		5	1		8
Tharaka					1	1			2
Tseikuru	1		1						2
Kyuso	1	2		2	3	10			18
Ngomeni		1		3		2			6
Ukasi						3		2	5
Mivukoni				2	3				5
<b>Total (Kyuso)</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>9</b>	<b>7</b>	<b>21</b>	<b>1</b>	<b>2</b>	<b>46</b>
<b>Mwingi Division</b>									
Endui					1	3			4
Migwani				8		1			9
Mwingi		4			1	16			21
Mutongoni	7			42	16				65
<b>Total (Mwingi)</b>	<b>7</b>	<b>4</b>		<b>50</b>	<b>18</b>	<b>20</b>			<b>99</b>
<b>Central Division</b>									
Kanyangi				6	5				11
Matinyani	1	1		4	1				7
Yatta	3		1	3	7	1			15
Yatta B2				3					3
Changwithya	2	3	1	6	3				15
Nzambani		2		7			2		11
Miambani		3		1					4
Kisasi		3		3	1	2			9
<b>Total (Central)</b>	<b>6</b>	<b>12</b>	<b>2</b>	<b>33</b>	<b>17</b>	<b>3</b>	<b>2</b>		<b>75</b>
<b>TOTAL</b>	<b>15</b>	<b>26</b>	<b>3</b>	<b>96</b>	<b>49</b>	<b>46</b>	<b>8</b>	<b>2</b>	<b>244</b>
Additional W/T	11								11
Unknown Location	12			1					13
Other Unknowns									2
<b>GRAND TOTAL</b>	<b>38</b>	<b>26</b>	<b>3</b>	<b>97</b>	<b>49</b>	<b>46</b>	<b>8</b>	<b>2</b>	<b>270</b>



APPENDIX 6E: WATER CONSERVATION PROGRAMME - ALL DIVISIONS

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No cum/day		No cum/day		No cum/day		No cum/day		No cum/day		No cum/day	
<b>REHABILITATION</b>													
Rock catchments	R/C	4	40	4	40	6	60	1	10	0	0	15	150
Shallow wells	S/W	0	0	0	0	0	0	0	0	0	0	0	0
Ext Ground Tanks	EG/T	3	1.5	19	9.5	9	4.5	0	0	0	0	31	15.5
Earth dams (small)	E/DS	4	40	9	90	11	110	4	40	0	0	28	280
Sand Dams	S/D	1	5	30	150	20	100	10	50	0	0	61	305
Subsurface Dams	SS/D	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Rehabilitation</b>		<b>12</b>	<b>86.5</b>	<b>62</b>	<b>289.5</b>	<b>46</b>	<b>274.5</b>	<b>15</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>135</b>	<b>750.5</b>
<b>NEW CONSTRUCTION</b>													
Rock catchments	R/C	5	50	11	110	14	140	18	180	18	180	66	660
Sand dams	S/D	0	0	2	10	9	45	13	65	12	60	36	180
Subsurface dams	SS/D	0	0	2	10	9	45	14	70	14	70	39	195
Earth dams (small)	E/DS	20	200	30	300	30	300	40	400	40	400	160	1600
<b>Subtotal New Constr.</b>		<b>25</b>	<b>250</b>	<b>45</b>	<b>430</b>	<b>62</b>	<b>530</b>	<b>85</b>	<b>715</b>	<b>84</b>	<b>710</b>	<b>301</b>	<b>2635</b>
<b>SUBCONTRACTED:</b>													
Ext Ground Tanks	EG/T	10	5	15	7.5	55	27.5	90	45	90	45	260	130
Shallow wells	S/W	5	25	10	50	35	175	55	275	60	300	165	825
<b>Subtotal Subcontr.</b>		<b>15</b>	<b>30</b>	<b>25</b>	<b>57.5</b>	<b>90</b>	<b>202.5</b>	<b>145</b>	<b>320</b>	<b>150</b>	<b>345</b>	<b>425</b>	<b>955</b>
<b>TOTALS</b>		<b>52</b>	<b>366.5</b>	<b>132</b>	<b>777</b>	<b>198</b>	<b>1007</b>	<b>245</b>	<b>1135</b>	<b>234</b>	<b>1055</b>	<b>861</b>	<b>4340.5</b>



## APPENDIX 6F: WATER CONSERVATION PROGRAMME PER DIVISION

TABLE 1.1: CENTRAL DIVISION

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>REHABILITATION &amp; COMPLETION</b>													
Rock catchments	R/C	0	0	0	0	0	0	1	10	0	0	1	10
Ext Ground Tanks	EG/T	0	0	13	6.5	4	2	0	0	0	0	17	8.5
Earth dams (small)	E/DS	0	0	2	20	4	40	4	40	0	0	10	100
Sand Dams	S/D	0	0	3	15	9	45	4	20	0	0	16	80
Subtotal rehabilitation		0	0	18	41.5	17	87	9	70	0	0	44	198.5
<b>NEW CONSTRUCTION</b>													
Rock catchments	R/C	0	0	0	0	3	30	5	50	5	50	13	130
Sand dams	S/D	0	0	0	0	3	15	5	25	5	25	13	65
Subsurface dams	SS/D	0	0	0	0	3	15	5	25	5	25	13	65
Earth dams (small)	E/DS	0	0	0	0	5	50	10	100	10	100	25	250
Subtotal new construction		0	0	0	0	14	110	25	200	25	200	64	510
<b>SUBCONTRACTED:</b>													
Ext Ground Tanks	EG/T	0	0	0	0	20	10	40	20	40	20	100	50
Shallow wells	S/W	0	0	0	0	10	50	20	100	20	100	50	250
Subtotal subcontracts		0	0	0	0	30	60	60	120	60	120	150	300
<b>TOTALS</b>		0	0	18	41.5	61	257	94	390	85	320	258	1008.5

TABLE 1.2: CENTRAL DIVISION - REHABILITATION AND COMPLETION PROGRAMME

Project Name	Location	Project Type	Cost '000 Shs	Total Costs
<b>YEAR 2 - 1991/92</b>				
Katativa	Kanyangi	S/D	29.93	
Syekulu	Nzambani	S/D	33.19	
Kyambiti	Kanyangi	S/D	28.80	
Mbusyani	Changwithya	E/DS	18.68	
Ngungani	Yatta	E/DS	19.30	
Katulani Sec. School		EG/T	1.13	
Kauma A Sec. School		EG/T	1.13	
Kauma B Sec. School		EG/T	0.23	
Kauma Health Centre		EG/T	3.00	
Kithumula Sec. School		EG/T	0.23	
Kvamulungu Sec. School		EG/T	3.00	
Kyasuni Honey Centre		EG/T	0.23	
Kyuluni Sec. School		EG/T	1.13	
Mbitini Sec. School		EG/T	1.13	
Nzambani Sec. School		EG/T	1.13	
Tiva A Sec. School		EG/T	0.23	
Tiva B Sec. School		EG/T	1.13	
Tungutu Sec. School		EG/T	0.23	
		<b>Summary, Yr 2:</b>		
		S/D	3	91.92
		E/DS	2	37.98
		EG/T	13	13.93
		<b>TOTALS</b>	<b>18</b>	<b>143.83</b>
<b>YEAR 3 - 1992/93</b>				
Kamanyi	Kanyangi	S/D	23.07	
Kangulu	Nzambani	S/D	44.22	
Kiliku	Nzambani	S/D	8.10	
Kva Mvamba	Kisasi	S/D	9.90	
Mutindi	Matinyani	S/D	19.35	
Ndungoni	Nzambani	S/D	9.79	
Nguuni 2	Nzambani	S/D	23.97	
Nzukiweve	Kanyangi	S/D	9.79	
Syokilove	Kanyangi	S/D	37.35	
Itulu	Yatta	E/DS	16.43	
Katuvu	Kanyangi	E/DS	16.43	
Malimbani	Kanyangi	E/DS	16.43	
Mathunzini	Changwithya	E/DS	22.28	
Changwithya School	Changwithya	EG/T	0.23	
St Lukes Secondary Sch	Yatta	EG/T	0.23	
St Lukes Secondary Sch	Yatta	EG/T	0.23	
Yatta Dispensary	Yatta	EG/T	2.48	
		<b>Summary, Yr 3:</b>		
		S/D	9	185.54
		E/DS	4	71.57
		EG/T	4	3.17
		<b>TOTALS</b>	<b>17</b>	<b>260.28</b>
<b>YEAR 4 - 1993/94</b>				
Nguutu	Kisasi	R/C	4.73	
Ikindu 1	Changwithya	S/D	37.35	
Ikindu 2	Changwithya	S/D	17.10	
Kauma	Matinyani	S/D	22.17	
Kyangaa	Kisasi	S/D	40.39	
Kva Katuku	Yatta	E/DS	22.50	
Malimbani	Kanyangi	E/DS	22.50	
Maokoekani	Kanyangi	E/DS	14.97	
Yenge	Kanyangi	E/DS	22.50	
		<b>Summary, Yr 4:</b>		
		R/C	1	4.73
		S/D	4	117.01
		E/DS	4	82.47
		<b>TOTALS</b>	<b>9</b>	<b>204.21</b>
<b>REHABILITATION SCHEDULE, MOA, CENTRAL DIVISION</b>				
		R/C	1	4.73
		S/D	16	394.47
		E/DS	10	192.02
		E/GT	17	17.10
		<b>TOTALS</b>	<b>44</b>	<b>608.32</b>
<b>SITES FOR FURTHER CONSIDERATION</b>				
Mangue	Nzambani	S/D	FC	
Mutune 1		S/D	FC	
Mutune 2		S/D	FC	

Note: see paragraph 6.54 for explanation of costs.

TABLE 2.1: KYUSO DIVISION

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>REHABILITATION &amp; COMPLETION</b>													
Rock catchments	R/C	3	30	3	30	2	20	0	0	0	0	8	80
Ext Ground Tanks	EG/T	0	0	1	0.5	0	0	0	0	0	0	1	0.5
Earth dams (small)	E/DS	2	20	1	10	0	0	0	0	0	0	3	30
Sand Dams	S/D	0	0	1	5	0	0	0	0	0	0	1	5
Subtotal rehabilitation		5	50	6	45.5	2	20	0	0	0	0	13	115.5
<b>NEW CONSTRUCTION</b>													
Rock catchments	R/C	0	0	3	30	5	50	5	50	5	50	18	180
Sand dams	S/D	0	0	1	5	2	10	2	10	2	10	7	35
Subsurface dams	SS/D	0	0	1	5	2	10	2	10	2	10	7	35
Earth dams (small)	E/DS	0	0	5	50	10	100	10	100	10	100	35	350
Subtotal new constructi		0	0	10	90	19	170	19	170	19	170	67	600
<b>SUBCONTRACTED:</b>													
Ext Ground Tanks	EG/T	0	0	5	2.5	10	5	10	5	10	5	35	17.5
Shallow wells	S/W	0	0	5	25	10	50	10	50	10	50	35	175
Subtotal subcontracts		0	0	10	27.5	20	55	20	55	20	55	70	192.5
<b>TOTALS</b>		<b>5</b>	<b>50</b>	<b>26</b>	<b>163</b>	<b>41</b>	<b>245</b>	<b>39</b>	<b>225</b>	<b>39</b>	<b>225</b>	<b>150</b>	<b>908</b>



TABLE 2.2: KYUSO DIVISION - REHABILITATION AND COMPLETION PROGRAMME

Project Name	Location	Project Type	Cost '000 KShs	Totals
<b>YEAR 1 - 1990/91</b>				
Kivila	Kyuso	R/C	88.76	
Mui	Kyuso	R/C	81.11	
Mwethani	Katse	R/C	45.00	
Manzui	Muvakoni	E/DS	33.01	
Muthaaka	Kyuso	E/DS	9.90	
		Summary, Yr 1:	R/C	3
			E/DS	2
		TOTALS		5
				214.87
				42.91
				257.78
<b>YEAR 2 - 1991/92</b>				
Kaisinga	Katse	R/C	134.44	
Ndumonya	Kyuso	R/C	212.74	
Ukasini	Kyuso	R/C	197.66	
Ituluni	Ituluni	S/D	18.90	
Mulangoni	Mivukoni	E/DS	17.78	
Kyuso Secondary Sch.		EG/T	0.79	
		Summary, Yr 2:	R/C	3
			S/D	1
			E/DS	1
			EG/T	1
		TOTALS		6
				544.84
				18.90
				17.78
				0.79
				582.31
<b>YEAR 3 - 1992/93</b>				
Kimangao	Kyuso	R/C	76.62	
Uveta	Tharaka	R/C	20.47	
			R/C	2
		TOTALS		2
				97.09
				97.09
<b>REHABILITATION SCHEDULE, MOA, KYUSO DIVISION</b>				
			R/C	8
			S/D	1
			E/DS	3
			E/GT	1
		TOTALS		13
				856.80
				18.90
				60.69
				0.79
<b>SITES FOR FURTHER CONSIDERATION</b>				
Kamrini	Tharaka	E/DS		FC
Mulangoni		E/D?		FC
Musosya		S/D		FC

Note: see paragraph 6.54 for explanation of costs.

TABLE 3.1: MWINGI DIVISION

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>REHABILITATION &amp; COMPLETION</b>													
Rock catchments	R/C	0	0	1	10	4	40	0	0	0	0	5	50
Ext Ground Tanks	EG/T	0	0	5	2.5	5	2.5	0	0	0	0	10	5
Earth dams (small)	E/DS	0	0	1	10	7	70	0	0	0	0	8	80
Sand Dams	S/D	0	0	26	130	11	55	6	30	0	0	43	215
Subtotal rehabilitation		0	0	33	152.5	27	167.5	6	30	0	0	66	350
<b>NEW CONSTRUCTION</b>													
Rock catchments	R/C	0	0	0	0	3	30	5	50	5	50	13	130
Sand dams	S/D	0	0	0	0	3	15	5	25	5	25	13	65
Subsurface dams	SS/D	0	0	0	0	3	15	5	25	5	25	13	65
Earth dams (small)	E/DS	0	0	0	0	5	50	10	100	10	100	25	250
Subtotal new constructn		0	0	0	0	14	110	25	200	25	200	64	510
<b>SUBCONTRACTED:</b>													
Ext Ground Tanks	EG/T	0	0	0	0	10	5	20	10	20	10	50	25
Shallow wells	S/W	0	0	0	0	5	25	10	50	10	50	25	125
Subtotal subcontracts		0	0	0	0	15	30	30	60	30	60	75	150
<b>TOTALS</b>		0	0	33	152.5	56	307.5	61	290	55	260	205	1010

TABLE 3.2: MWINGI DIVISION - REHABILITATION AND COMPLETION PROGRAMME

Project Name	Location	Project Type	Cost '000 KShs	Totals
YEAR 2 - 1991/92				
Kaibusya	Endui	R/C	56.70	
Kaavindi	Mutangoni	S/D	10.02	
Kaavivia	Mutangoni	S/D	17.10	
Kaunyu	Migvani	S/D	10.01	
Kasingili 2	Mutangoni	S/D	22.17	
Kivulu 1	Mutangoni	S/D	13.05	
Kivulu 2	Mutangoni	S/D	8.66	
Kva Kamengo	Mutangoni	S/D	22.17	
Kva Kithangai	Mutangoni	S/D	17.10	
Kva Mbui	Mutangoni	S/D	15.08	
Kva Mukeka	Mutangoni	S/D	11.93	
Kva Nduma	Mutangoni	S/D	22.17	
Kvamaketi	Migvani	S/D	16.71	
Makvenye	Migvani	S/D	19.13	
Malulumo	Mutangoni	S/D	14.07	
Masia B	Mutangoni	S/D	10.01	
Maukuni	Mutangoni	S/D	27.23	
Mavalo	Mutangoni	S/D	15.08	
Mikuyuni	Mutangoni	S/D	22.17	
Misyini	Mutangoni	S/D	32.29	
Mithini	Mutangoni	S/D	14.29	
Muthimba	Mutangoni	S/D	19.13	
Mwangya A	Mutangoni	S/D	32.29	
Mwangya B	Mutangoni	S/D	6.98	
Nginyai	Mutangoni	S/D	22.17	
Ngongu	Mutangoni	S/D	12.04	
Ngwuni B	Mutangoni	S/D	12.04	
Kataa	Mutangoni	E/DS	14.63	
Mwingi Secondary School	Mwingi	E6/T	0.23	
Nzalia Secondary School		E6/T	1.13	
Thitani A Sec. School		E6/T	1.13	
Thitani B Sec. School		E6/T	1.13	
Waita Secondary School		E6/T	1.13	
Summary, Yr 2:		R/C	1	56.70
		S/D	26	445.09
		E/DS	1	14.63
		E6/T	5	4.75
<b>TOTALS</b>			<b>33</b>	<b>521.17</b>

(cont...)

TABLE 3.2 (cont'd): MWINGI DIVISION - REHAB. AND COMPLETION PROGRAMME

Project Name	Location	Project Type	Cost '000 KShs	Totals
<b>YEAR 3 - 1992/93</b>				
Kakitia I	Mwingi	R/C	27.34	
Kathonzveni	Migvani	R/C	20.70	
Ndunguri	Endui	R/C	73.24	
Wikyonze	Mwingi	R/C	111.26	
Itumba	Migvani	S/D	27.45	
Kakusvi	Mutonguni	S/D	42.41	
Kalundu	Migvani	S/D	13.05	
Kamunyu	Migvani	S/D	11.03	
Katundu	Mutonguni	S/D	42.41	
Kayesaa	Mutonguni	S/D	26.44	
Kiteeti	Mutonguni	S/D	57.60	
Kwa Kalole	Mutonguni	S/D	31.28	
Kwa Mutiso	Mutonguni	S/D	17.10	
Kyethnya	Mutonguni	S/D	14.06	
Mouni	Mutonguni	S/D	22.16	
Emivia	Mutonguni	E/DS	12.15	
Kasakini	Mutonguni	E/DS	12.15	
Kataa Mbeleete	Mutonguni	E/DS	6.98	
Kutha	Mutonguni	E/DS	63.00	
Kwa Mutava	Mutonguni	E/DS	12.38	
Kwa Nzuki	Mutonguni	E/DS	11.25	
Mang'elu	Mutonguni	E/DS	11.25	
Ilako Secondary Sch	Mutonguni	EG/T	0.23	
Ilako Secondary Sch	Mutonguni	EG/T	0.23	
Kekeani Secondary Sch	Mutonguni	EG/T	3.60	
Katheka Secondary Sch	Mutonguni	EG/T	0.23	
Katheka Secondary Sch	Mutonguni	EG/T	0.23	
		Summary, Yr 3:		
		R/C	4	232.54
		S/D	11	304.99
		E/DS	7	129.16
		EG/T	5	4.52
		<b>TOTALS</b>	<b>27</b>	<b>671.21</b>
<b>YEAR 4 - 1993/94</b>				
Kasue A	Mutonguni	S/D	15.08	
Kasue B	Mutonguni	S/D	13.05	
Kavoko	Mutonguni	S/D	12.04	
Kivaani	Mutonguni	S/D	14.97	
Kwa Kimvele	Mutonguni	S/D	26.44	
Masia A	Mutonguni	S/D	20.25	
		Summary, Yr 4:		
		S/D	6	101.83
		<b>TOTALS</b>	<b>6</b>	<b>101.83</b>
<b>REHABILITATION SCHEDULE, MOA, MWINGI DIVISION</b>				
		R/C	5	289.24
		S/D	43	851.91
		E/DS	8	143.79
		E/GT	10	9.27
		<b>TOTALS</b>	<b>66</b>	<b>1294.21</b>
<b>REHABILITATION TO BE CONSIDERED</b>				
Mwingi		R/C	FC	
Itumba	Migvani	S/D	FC	
Meko		S/D	FC	
Munyuabani		E/DS	FC	
Kaiveti		E/DS	FC	
Kitulani		E/DS	FC	
Mange'lu		E/DS	FC	
Nginyai		E/DS	FC	

Note: see paragraph 6.54 for explanation of costs.

TABLE 4.1: MUTITO DIVISION

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>REHABILITATION &amp; COMPLETION</b>													
Rock catchments	R/C	1	10	0	0	0	0	0	0	0	0	1	10
Ext Ground Tanks	EG/T	3	1.5	0	0	0	0	0	0	0	0	3	1.5
Earth dams (small)	E/DS	2	20	5	50	0	0	0	0	0	0	7	70
Sand Dams	S/D	1	5	0	0	0	0	0	0	0	0	1	5
Subtotal rehabilitation		7	36.5	5	50	0	0	0	0	0	0	12	86.5
<b>NEW CONSTRUCTION</b>													
Rock catchments	R/C	0	0	3	30	3	30	3	30	3	30	12	120
Sand dams	S/D	0	0	1	5	1	5	1	5	0	0	3	15
Subsurface dams	SS/D	0	0	1	5	1	5	2	10	2	10	6	30
Earth dams (small)	E/DS	0	0	5	50	10	100	10	100	10	100	35	350
Subtotal new constructn		0	0	10	90	15	140	16	145	15	140	56	515
<b>SUBCONTRACTED:</b>													
Ext Ground Tanks	EG/T	0	0	10	5	15	7.5	20	10	20	10	65	32.5
Shallow wells	S/W	0	0	5	25	10	50	15	75	20	100	50	250
Subtotal subcontracts		0	0	15	30	25	57.5	35	85	40	110	115	282.5
<b>TOTALS</b>		<b>7</b>	<b>36.5</b>	<b>30</b>	<b>170</b>	<b>40</b>	<b>197.5</b>	<b>51</b>	<b>230</b>	<b>55</b>	<b>250</b>	<b>183</b>	<b>884</b>

TABLE 4.2: MUTITO DIVISION - REHABILITATION AND COMPLETION PROGRAMME

Project Name	Location	Project Type	Cost '000 KShs	Totals
<b>YEAR 1 - 1990/91</b>				
Nzanzu	Nuu	R/C	40.73	
Masaani	Mui	S/D	69.65	
Mutito	Mutito	E/DS	12.50	
Ulonzo	Mutito	E/DS	24.65	
Mwita Health Centre		EG/T	12.38	
Zombe Sec. School		EG/T	1.13	
Zombe Sec. School		EG/T	0.23	
		Summary, Yr 1:		
		R/C	1	40.73
		S/D	1	69.65
		E/DS	2	37.15
		EG/T	3	13.74
		<b>TOTALS</b>	<b>7</b>	<b>161.27</b>
<b>YEAR 2 - 1991/92</b>				
Kavingo	Mui	E/DS	3.60	
Muyuni	Mui	E/DS	12.60	
Syoiu	Mui	E/DS	7.20	
Mutveia	Nuu	E/DS	17.78	
Nzaani	Endau	E/DS	17.78	
		Summary, Yr 2:		
		E/DS	5	58.96
		<b>TOTALS</b>	<b>5</b>	<b>58.96</b>
<b>REHABILITATION SCHEDULE, NOA, MUTITO DIVISION</b>				
		R/C	1	40.73
		S/D	1	69.65
		E/DS	7	96.11
		E/GT	3	13.74
		<b>TOTALS</b>	<b>12</b>	<b>220.23</b>

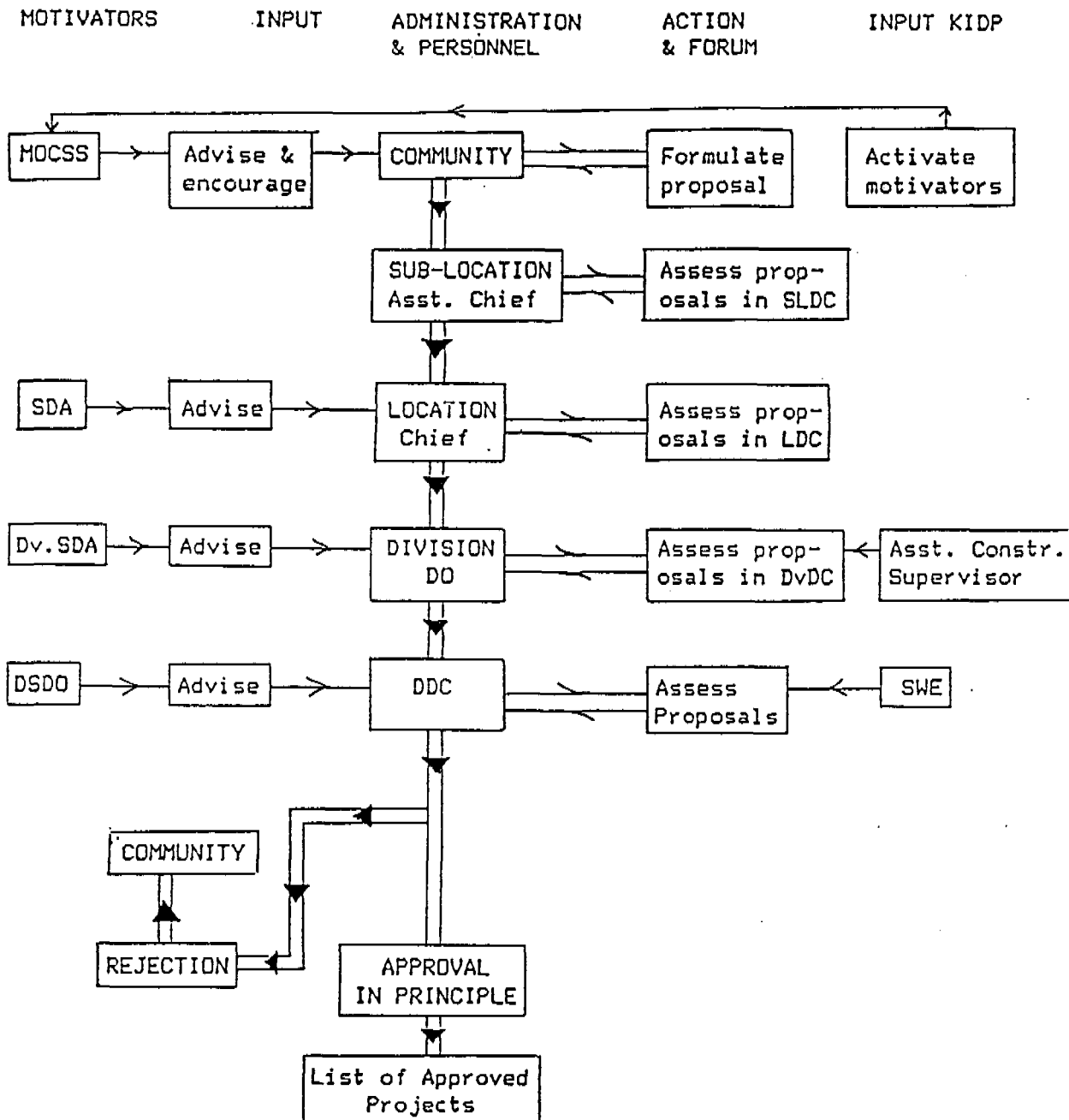
Note: see paragraph 6.54 for explanation of costs.

TABLE 5.1: MUTOMO DIVISION

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>NEW CONSTRUCTION</b>													
Rock catchments	R/C	5	50	5	50	0	0	0	0	0	0	10	100
Earth dams (small)	E/DS	20	200	20	200	0	0	0	0	0	0	40	400
Subtotal new constructn		25	250	25	250	0	0	0	0	0	0	50	500
<b>SUBCONTRACTED:</b>													
Ext Ground Tanks	EG/T	10	5	0	0	0	0	0	0	0	0	10	5
Shallow wells	S/W	5	25	0	0	0	0	0	0	0	0	5	25
Subtotal subcontracts		15	30	0	0	0	0	0	0	0	0	15	30
<b>TOTALS</b>		<b>40</b>	<b>280</b>	<b>25</b>	<b>250</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>65</b>	<b>530</b>

**APPENDIX 6B: WATER PROJECT DECISION FRAMEWORK**

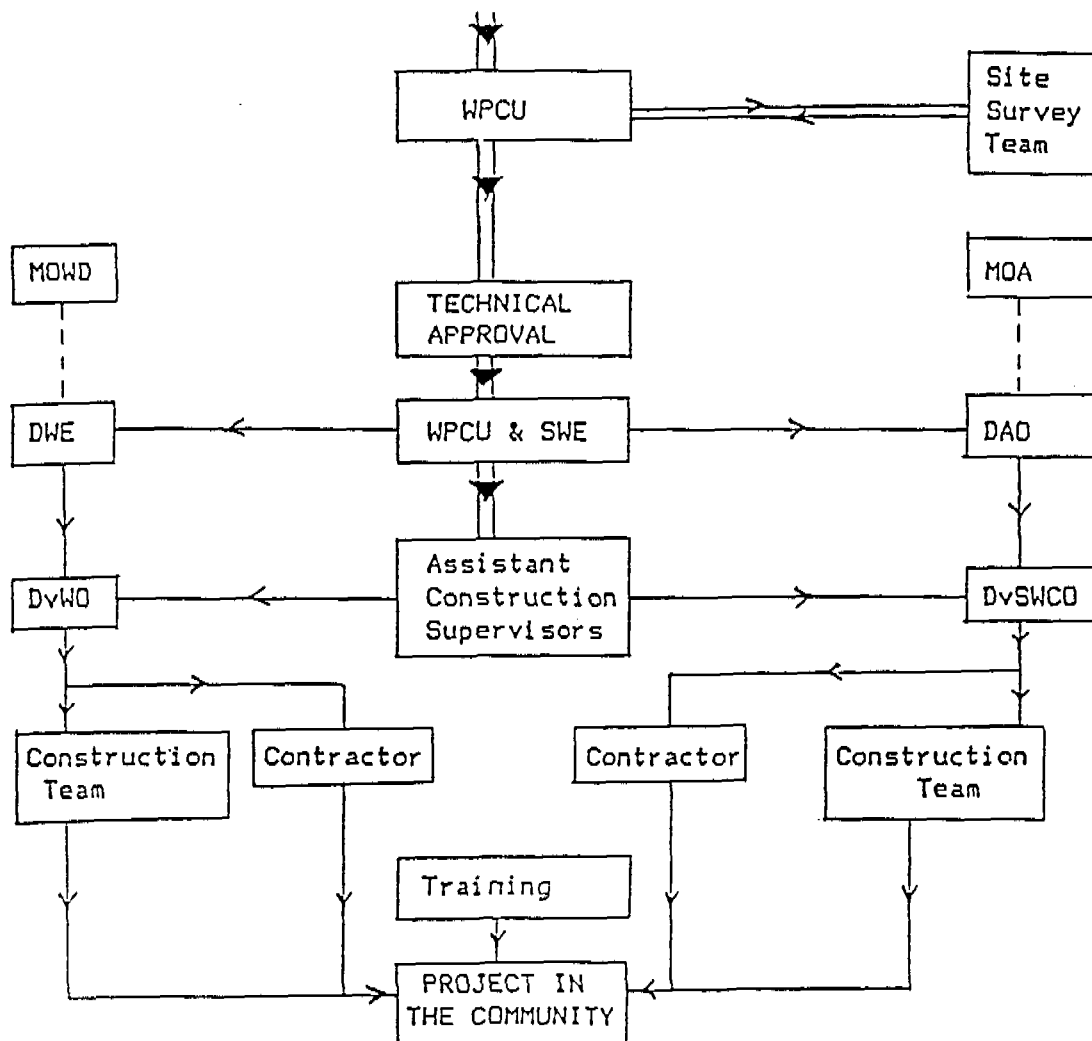
**1. FROM COMMUNITY PROPOSAL TO DDC APPROVAL:**



(Referral to WFCU - see over)



2. FROM DDC APPROVAL TO IMPLEMENTATION:



<b>KEY:</b>	MOCSS	Ministry of Culture & Social Services
	MOA	Ministry of Agriculture
	MOWD	Ministry of Water Development
	DDC	District Development Committee
	Dv.SDA	Divisional Social Development Assistant
	SDA	Social Development Assistant
	SLDC	Sub-locational Development Committee
	LDC	Locational Development Committee
	DvDC	Divisional Development Committee
	DO	District Officer
	DSDO	District Social Development Officer
	DWE	District Water Engineer
	DAO	District Agricultural Officer
	SWE	Senior Water Engineer (KIDP)
	WPCU	Water Programme Coordination Unit
	DvWO	Divisional Water Officer
	DvSWCO	Divisional Soil & Water Conservation Officer

==== Critical decision path  
 --- Other actions

## CHAPTER 7

### RURAL WATER SUPPLY

#### Objectives and Strategy

7.1 The immediate objectives of the KIDP support to rural water supply in Kitui District are as follows:

- (a) to strengthen the capacity of the District Water Engineer to improve the availability of safe and reliable water supplies for rural people and their livestock;
- (b) to reinforce the capability of rural people to operate and maintain their own water supplies.

#### Target Group

7.2 The target group includes all rural people, but especially those living in the resource-poor, arid and semi-arid areas of the District. Small towns are outside the scope of the Programme in this first phase, but may be considered later.

#### Rationale

7.3 The strategy and rationale for the rural water supply programme is described in Chapter 2 of the Plan of Operations (paras 2.22 - 2.27).

7.4 The prime responsibility for supplying water to the community lies with the MOWD. For a number of reasons, including the dispersed settlement pattern and the absence of perennial sources throughout much of the District, a number of private and non-government organisations<sup>[1]</sup> are involved in water supply development in addition to MOWD.

7.5 UNICEF have funded improved water supplies in Kitui District since 1984 and their programme is currently being extended until 1993/94. Most of their assistance is channelled through the MOWD, which affects its capacity to take on assistance from other donors. Current emphasis is placed on roof catchments in Primary Schools (100), spring protection (2) and rock catchment construction (2). A limited programme of shallow well construction and rehabilitation (10) is also envisaged, as is the possibility of a borehole construction programme.

7.6 Water supplies are normally obtained from local water conservation structures which, although easily constructed and maintained, have the marked disadvantage of drying up in years of rainfall failure, exposing people and their animals to severe hardship.

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[1] Of these, the most important NGO is the Diocese of Kitui.

7.7 The population of the District is doubling every twenty years or so and the domestic water supply situation is expected to worsen, especially in the rapidly expanding townships. The search for a solution to these problems will certainly remain at the top of the agenda of the District Water Engineer (DWE) for the foreseeable future. KIDP is aimed at natural resource conservation and regeneration in arid and semi-arid lands and therefore the pressing problems of urban water supply lie outside the scope of KIDP; however, by assisting the MOWD with the larger of the rural water conservation structures and by fostering an approach which encourages self-reliance among rural communities with respect to operation and maintenance, KIDP will contribute in some way to easing the pressure on the DWE's office. In an attempt to resolve the problem of water security in a drought year, which affects rural people equally if not more seriously than those living in towns, KIDP will carry out a survey of groundwater and spring development potential in PY1, focusing on the more densely populated areas of the District (see Annex F).

### Outputs

7.8 Geographical Priority. In the initial years priority will be given to Mutito and Kyuso Divisions as they are situated in the drier parts of the District. Work in Mwingi and Central Divisions will commence later in the Programme. Mutomo will receive lowest priority in view of the work done by MSWCP in Mutomo Division over the period 1982-89. Annual and Divisional work programmes and physical targets are shown in Appendixes 7A and 7B. The proposed water conservation programme and the choice of technology could be modified as a result of the findings of the surveys of groundwater and spring development potential scheduled for PY1.

7.9 Rehabilitation. The rehabilitation and completion of existing water projects, especially those started under the previous ASAL programme will constitute a significant part of the first year's work. MOWD also proposes to commence rehabilitation of silted dams in the first year.<sup>[2]</sup> This rehabilitation work will allow time for the identification of new sites (or further sites requiring rehabilitation). PY2-5 will see a shift in emphasis from rehabilitation to new construction in response to community-identified developments.

7.10 Water Supply Technology. Types of scheme to be constructed by MOWD will include those already listed in Chapter 6 (para. 6.43) for the MOA. However, the MOWD will concentrate on those KIDP water conservation structures which require a larger engineering input in design and supervision. KIDP will provide building materials, transport costs and skilled labour on condition that local people provide all construction labour free of charge and take over responsibility for operation and maintenance of the structure once it is completed.

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[2] It is essential for earth dam construction to be accompanied by soil conservation measures upstream by the MOA. Because of the need to mobilise the local community for this work, earth dam construction needs an appropriate lead time.

7.11 Choice of Technology. Usually, the type of water conservation structure will be determined by local hydrological conditions. Where alternatives exist, preference will be given to those options which allow active community participation in construction and maintenance.

7.12 Selection of New Schemes will be initiated by the community following the system illustrated in Appendix 6G, described in Box 6.1 and in Chapter 2 (paras 2.6 - 2.10) and Chapter 4 (paras 4.16 - 4.21).

7.13 Technical Appraisal. A Site Survey Consultant will be contracted (part time) by the PMU to work under the Senior Water Engineer of the Water Programme Coordination Unit (see Chapter 3). His role will be to assess the technical feasibility of sites proposed for development (new construction or rehabilitation) by the community, prior to final approval (see Annex F.IX).

7.14 Allocation of Work between MOA and MOWD: Once a scheme has been approved for construction by the DDC and the Site Survey Team have confirmed its technical suitability, the Senior Water Engineer in the WPCU, the DWE and the DAD will reach agreement within the Programme Steering Committee on which ministry will carry out the work. The decision will depend upon the technical complexity of the scheme, the current work plans of the implementing ministries and their staff deployment in the District.

7.15 Subcontracting. Wherever possible, skilled construction work (e.g. masonry, form work, pipe work) will be subcontracted to local artisans who will be encouraged to compete for the work for smaller construction works such as tanks, rock catchments etc. Local people will also be encouraged to enter into transport contracts for the movement of construction materials, for example locally crushed stone for ballast and locally quarried building stone for masonry. It will not be necessary to bring in ballast from Nairobi, a practice which led to problems and high costs on the previous USAID ASAL project.

7.16 Work on larger structures, such as the construction of new or the desilting of old medium-sized dams, will be subcontracted in entirety, including design, to qualified contractors. This will be necessary as MOWD does not have the required earth-moving equipment. The normal tender procedures as prescribed by the District Tender Board will be followed.

7.17 Tender documents will specify standard construction methods. A manual containing this information is currently being prepared by a Danida consultant.<sup>[3]</sup>

7.18 Supervision of Work. The Divisional Water Officer (under the supervision of the District Water Engineer) will be responsible for supervising the distribution of materials to the site and for the technical supervision of the works carried out by the local subcontractor and/or the group committee, who will be responsible for

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[3] Erik Nissen Petersen.

the materials once they are delivered to the site. The Programme-paid Divisional Assistant Construction Supervisor will assist the Divisional Water Officer with controlling the quality of works and general coordination. However, responsibility for overall supervision of MOWD's rural water supply work at the Divisional level will lie with the Divisional Water Officer.

**7.19 Training.** The CETS (see Chapter 5) will coordinate training for local water committees in operation and maintenance procedures as well as organise courses for maintenance technicians. Training courses will also be given to small contractors to help them acquire skills in bookkeeping, cost accounting, etc. On-the-job training of local artisans will be provided by the Assistant Construction Supervisor in each Division.

**7.20 Planning and Budgeting.** A plan and budget for the following year will be prepared in March/April each year. The proposals in the Plan of Operations for PY2-5 will be revised on the basis of performance in PY1.

### Inputs

**7.21 Capital Costs.** (See Annex L, Tables 3.1 and 3.1.1 - 3.1.6.) District HQ will be supplied with a 4WD Pick-up, 3.5 tonne lorry and two motorbikes as well as survey equipment and hand-operated drilling rig. Each Division, with the exception of Mutomo, will receive a 4WD Pick-up, a motorbike, a tractor and trailer, water bowser and water pump. (The WPCU office in the KIDP office block at Divisional level will be shared with MOWD.)

**7.22 Operating Costs.** These include funds for operation of KIDP vehicles and construction equipment, materials and tools and a provision in each Division for materials and tools and for subcontracts (mainly earth dams).

**7.23** The costs of rehabilitation and completion of past projects will include cement, reinforcing materials, piping, skilled labour (provided by subcontractors), KIDP and subcontractors' overheads, and an allowance for contingencies. Haulage of sand, ballast and water to the sites will be carried out with ox/donkey or hand-carts; these are budgeted for in Tables 3.1.1 - 3.1.6, Annex L. Sand, stones, hardcore and infill, water, and unskilled labour will be provided by mwethya groups.

7.24 Staffing. MOWD will make available the following staff for the supervision of the work:

- MOWD Kitui HQ:

District Water Engineer	1
Senior Water Inspector	1
Water Inspectors	2
Geologist	1
Engineering Assistants	2
Draughtsmen	1
Surveyor Assistant	1
Masons	2
Plumbers	2
Drivers	2

(Some of the above staff will work part-time at Divisional centres.)

- MOWD Divisional level:

Divisional Water Inspector	1
Inspector	1
Engineering Assistants	2

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**APPENDIX 7A: RURAL WATER SUPPLY CONSTRUCTION PROGRAMME  
- ALL DIVISIONS**

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL		
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	
<b>REHABILITATION AND COMPLETION</b>														
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock catchments	R/C	1	10	4	40	1	10	0	0	0	0	6	60	
Shallow wells	S/W	0	0	0	0	0	0	2	10	0	0	2	10	
Ext Ground Tanks	EG/T	0	0	0	0	0	0	0	0	0	0	0	0	
Earth dams (small)	E/DS	0	0	0	0	0	0	0	0	0	0	0	0	
Sand Dams	S/D	0	0	3	15	4	20	0	0	0	0	7	35	
Subsurface Dams	SS/D	0	0	2	10	0	0	0	0	0	0	2	10	
<b>Total Rehabilitation</b>		<b>1</b>	<b>10</b>	<b>9</b>	<b>65</b>	<b>5</b>	<b>30</b>	<b>2</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>115</b>	
<b>NEW CONSTRUCTION</b>														
Spring & pipeline	S/P	0	0	1	20	1	20	1	20	1	20	4	80	
Rock catchments	R/C	0	0	4	40	11	110	17	170	17	170	49	490	
Sand dams	S/D	0	0	0	0	6	30	12	60	11	55	29	145	
Subsurface dams	SS/D	0	0	1	5	6	30	12	60	12	60	31	155	
Earth dams (small)	E/DS	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Subtotal New Constr.</b>		<b>0</b>	<b>0</b>	<b>6</b>	<b>65</b>	<b>24</b>	<b>190</b>	<b>42</b>	<b>310</b>	<b>41</b>	<b>305</b>	<b>113</b>	<b>870</b>	
<b>SUBCONTRACTED:</b>														
Earth dams(new)	E/DM	4	240	5	300	6	360	9	540	9	540	33	1980	
Earth dams(desilt)	E/DM	13	780	17	1020	11	660	6	360	0	0	47	2820	
<b>Subtotal Subcontr.</b>		<b>17</b>	<b>1020</b>	<b>22</b>	<b>1320</b>	<b>17</b>	<b>1020</b>	<b>15</b>	<b>900</b>	<b>9</b>	<b>540</b>	<b>80</b>	<b>4800</b>	
<b>TOTALS</b>		<b>18</b>	<b>1030</b>	<b>37</b>	<b>1450</b>	<b>46</b>	<b>1240</b>	<b>59</b>	<b>1220</b>	<b>50</b>	<b>845</b>	<b>210</b>	<b>5785</b>	





APPENDIX 7B: RURAL WATER SUPPLY PROGRAMME PER DIVISION

TABLE 1.1: CENTRAL DIVISION - MOWD

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>REHABILITATION AND COMPLETION</b>													
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0
Rock catchments	R/C	0	0	0	0	0	0	0	0	0	0	0	0
Shallow wells	S/W	0	0	0	0	0	0	2	10	0	0	2	10
Earth dams (small)	E/DS	0	0	0	0	0	0	0	0	0	0	0	0
Sand Dams	S/D	0	0	2	10	4	20	0	0	0	0	6	30
Subsurface Dams	SS/D	0	0	1	5	0	0	0	0	0	0	1	5
Subtotal rehabilitation		0	0	3	15	4	20	2	10	0	0	9	45
<b>NEW CONSTRUCTION</b>													
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0
Rock catchments	R/C	0	0	0	0	2	20	5	50	5	50	12	120
Sand dams	S/D	0	0	0	0	2	10	5	25	5	25	12	60
Subsurface dams	SS/D	0	0	0	0	2	10	5	25	5	25	12	60
Subtotal new constr.		0	0	0	0	6	40	15	100	15	100	36	240
<b>SUBCONTRACTED:</b>													
Earth dams(new)	E/DH	0	0	0	0	2	120	3	180	3	180	8	480
Earth dams(desilt)	E/DH	0	0	0	0	4	240	6	360	0	0	10	600
Subtotal subcontracts		0	0	0	0	6	360	9	540	3	180	18	1080
<b>TOTALS</b>		0	0	3	15	16	420	26	650	18	280	63	1365

TABLE 1.2: CENTRAL DIVISION - REHABILITATION AND COMPLETION

Project Name	Location	Project Type	Cost '000 KShs	Total Costs
<b>YEAR 2 - 1991/92</b>				
Kva Kavou 2	Changwithya	S/D	16.43	
Mililoni	Nzambani	S/D	19.80	
Kva Kavou 1	Changwithya	SS/D	23.96	
Summary, Yr 2:			S/D	2
			SS/D	1
<b>TOTALS</b>				36.23
				23.96
				60.19
<b>YEAR 3 - 1992/93</b>				
Kithumula	Matinyani	S/D	9.00	
Kyanduu 1	Yatta B2	S/D	9.68	
Kyanduu 2	Yatta B2	S/D	2.93	
Masaani	Yatta B2	S/D	12.38	
Muthongue	Mulango	E/DH	100.00	
Kasungwa	Kisasi	E/DH	100.00	
Muiabi	Kisasi	E/DH	100.00	
Ithiani	Changwithya	E/DH	100.00	
Summary, Yr 3:			S/D	4
			E/DH	4
<b>TOTALS</b>				33.99
				400.00
				433.99
<b>YEAR 4 - 1993/94</b>				
Kamulu	Kisasi	S/W	5.50	
Nzeleni	Kisasi	S/W	13.50	
Kyaani	Matinyani	E/DH	100.00	
Kauna	Matinyani	E/DH	100.00	
Kamandio	Miambani	E/DH	100.00	
Kavilo	Miambani	E/DH	100.00	
Kangulu	Mulango	E/DH	100.00	
Nzuki Iwe	Kangangi	E/DH	100.00	
Summary, Yr 4:			S/W	2
			E/DH	6
<b>TOTALS</b>				19.00
				600.00
				619.00
<b>REHABILITATION SCHEDULE, MOWD, CENTRAL DIVISION</b>				
			S/W	2
			S/D	6
			SS/D	1
			E/DH	10
<b>TOTALS</b>				19
				1113.18
<b>SITES FOR FURTHER CONSIDERATION</b>				
Ngiini	Changwithya	S/W	FC	
Mutindi		S/W	FC	
Matama		S/W	FC	
Ngungani		S/D	FC	

TABLE 2.1: KYUSO DIVISION - MOWD

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL		
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	
<b>REHABILITATION AND COMPLETION</b>														
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock catchments	R/C	0	0	3	30	1	10	0	0	0	0	4	40	
Shallow wells	S/W	0	0	0	0	0	0	0	0	0	0	0	0	
Earth dams (small)	E/DS	0	0	0	0	0	0	0	0	0	0	0	0	
Sand Dams	S/D	0	0	1	5	0	0	0	0	0	0	1	5	
Subsurface Dams	SS/D	0	0	1	5	0	0	0	0	0	0	1	5	
Subtotal rehabilitation		0	0	5	40	1	10	0	0	0	0	6	50	
<b>NEW CONSTRUCTION</b>														
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0	
Rock catchments	R/C	0	0	2	20	5	50	5	50	5	50	17	170	
Sand dams	S/D	0	0	0	0	1	5	1	5	1	5	3	15	
Subsurface dams	SS/D	0	0	0	0	1	5	1	5	1	5	3	15	
Subtotal new constr.		0	0	2	20	7	60	7	60	7	60	23	200	
<b>SUBCONTRACTED:</b>														
Earth dams(new)	E/DM	0	0	1	60	2	120	2	120	2	120	7	420	
Earth dams(desilt)	E/DM	4	240	6	360	4	240	0	0	0	0	14	840	
Subtotal subcontracts		4	240	7	420	6	360	2	120	2	120	21	1260	
<b>TOTALS</b>		<b>4</b>	<b>240</b>	<b>14</b>	<b>480</b>	<b>14</b>	<b>430</b>	<b>9</b>	<b>180</b>	<b>9</b>	<b>180</b>	<b>50</b>	<b>1510</b>	

TABLE 2.2: KYUSO DIVISION - REHABILITATION AND COMPLETION

Project Name	Location	Project Type	Cost '000 KShs	Total Costs
<b>YEAR 1 - 1990/91</b>				
Katia	Katse	E/DH	100.00	
Kva Musinga	Katse	E/DH	100.00	
Misuu	Kyuso	E/DH	100.00	
Mutingva	Kyuso	E/DH	100.00	
		Summary, Yr 1:	E/DH	4
		TOTALS		4
				400.00
				400.00
<b>YEAR 2 - 1991/92</b>				
Kaliluni	Ngoneni	R/C	47.25	
Kimuu 1	Ukasi	R/C	29.93	
Kimuu 2	Ukasi	R/C	25.88	
Masyungwa	Mivukoni	S/D	33.46	
Kaningo	Tseikuru	SS/D	38.08	
Kyusyani	Ukasi	E/DH	100.00	
Kathungu	Ukasi	E/DH	100.00	
Kva Mvundu	Ngoneni	E/DH	100.00	
Kva Syukathenge	Ngoneni	E/DH	100.00	
Masyungwa	Mivukoni	E/DH	100.00	
Manzui	Mivukoni	E/DH	100.00	
		Summary, Yr 2:	R/C	3
			S/D	1
			SS/D	1
			E/DH	6
		TOTALS		11
				103.06
				33.46
				38.08
				600.00
				774.60
<b>YEAR 3 - 1992/93</b>				
Muthuka	Ukasi	R/C	41.02	
Kanverini	Tharaka	E/DH	100.00	
Ndegea	Tharaka	E/DH	100.00	
Kva Ngito	Tseikuru	E/DH	100.00	
Makatfie	Tseikuru	E/DH	100.00	
		Summary, Yr 3:	R/C	1
			E/DH	4
		TOTALS		5
				41.02
				400.00
<b>REHABILITATION SCHEDULE, MOWD, KYUSO DIVISION</b>				
			R/C	4
			S/D	1
			SS/D	1
			E/DH	14
		TOTALS		20
				144.08
				33.46
				38.08
				1400.00
<b>SITES FOR FURTHER CONSIDERATION:</b>				
Kyuso Rock	Kyuso		R/C	FC
Ikime 1			R/C	FC
Ikime 2			R/C	FC
Ndatani 1			R/C	FC
Ndatani 2			R/C	FC
Mitamisiyi			S/W	FC
Tviyua			E/D	FC
Ukasi			B/H	FC
Mulangoni	Mivukoni		E/DS	FC
Muthuku			B/H	FC
Ukasi			B/H	FC

Note: see paragraph 7.23 for explanation of costs.

TABLE 3.1: MWINGI DIVISION - MOWD

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No cum/day		No cum/day		No cum/day		No cum/day		No cum/day		No cum/day	
<b>REHABILITATION AND COMPLETION</b>													
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0
Rock catchments	R/C	0	0	1	10	0	0	0	0	0	0	1	10
Shallow wells	S/W	0	0	0	0	0	0	0	0	0	0	0	0
Earth dams (small)	E/DS	0	0	0	0	0	0	0	0	0	0	0	0
Sand Dams	S/D	0	0	0	0	0	0	0	0	0	0	0	0
Subsurface Dams	SS/D	0	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal rehabilitation</b>		<b>0</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>10</b>
<b>NEW CONSTRUCTION</b>													
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0
Rock catchments	R/C	0	0	0	0	2	20	5	50	5	50	12	120
Sand dams	S/D	0	0	0	0	2	10	5	25	5	25	12	60
Subsurface dams	SS/D	0	0	0	0	2	10	5	25	5	25	12	60
<b>Subtotal new constr.</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>40</b>	<b>15</b>	<b>100</b>	<b>15</b>	<b>100</b>	<b>36</b>	<b>240</b>
<b>SUBCONTRACTED:</b>													
Earth dams(new)	E/DM	0	0	0	0	0	0	2	120	2	120	4	240
Earth dams(desilt)	E/DM	0	0	1	60	0	0	0	0	0	0	1	60
<b>Subtotal subcontracts</b>		<b>0</b>	<b>0</b>	<b>1</b>	<b>60</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>120</b>	<b>2</b>	<b>120</b>	<b>5</b>	<b>300</b>
<b>TOTALS</b>		<b>0</b>	<b>0</b>	<b>2</b>	<b>70</b>	<b>6</b>	<b>40</b>	<b>17</b>	<b>220</b>	<b>17</b>	<b>220</b>	<b>42</b>	<b>550</b>

TABLE 3.2: MWINGI DIVISION - REHABILITATION AND COMPLETION

Project Name	Location	Project Type	Cost '000 KShs	Total Costs
<b>YEAR 2 - 1991/92</b>				
Toibi Mungva	Mwingi Migvani	R/C E/DM	18.90 100.00	
<b>REHABILITATION SCHEDULE, MOWD, MWINGI DIVISION</b>				
		R/C E/DM	1 1	18.90 100.00
		<b>TOTALS:</b>	<b>2</b>	<b>118.90</b>
<b>SITES FOR FURTHER CONSIDERATION:</b>				
Kioo Rock	Mwingi	R/C	FC	
Mivukoni		S/W	FC	
Kathulini		S/D	FC	

Note: see paragraph 7.23 for explanation of costs.

TABLE 4.1: MUTITO DIVISION - MOWD

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>REHABILITATION AND COMPLETION</b>													
Spring & pipeline	S/P	0	0	0	0	0	0	0	0	0	0	0	0
Rock catchments	R/C	1	10	0	0	0	0	0	0	0	0	1	10
Shallow wells	S/W	0	0	0	0	0	0	0	0	0	0	0	0
Earth dams (small)	E/DS	0	0	0	0	0	0	0	0	0	0	0	0
Sand Dams	S/D	0	0	0	0	0	0	0	0	0	0	0	0
Subsurface Dams	SS/D	0	0	0	0	0	0	0	0	0	0	0	0
<b>Subtotal rehabilitation</b>		<b>1</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>10</b>
<b>NEW CONSTRUCTION</b>													
Spring & pipeline	S/P	0	0	1	20	1	20	1	20	1	20	4	80
Rock catchments	R/C	0	0	2	20	2	20	2	20	2	20	8	80
Sand dams	S/D	0	0	0	0	1	5	1	5	0	0	2	10
Subsurface dams	SS/D	0	0	1	5	1	5	1	5	1	5	4	20
<b>Subtotal new constr.</b>		<b>0</b>	<b>0</b>	<b>4</b>	<b>45</b>	<b>5</b>	<b>50</b>	<b>5</b>	<b>50</b>	<b>4</b>	<b>45</b>	<b>18</b>	<b>190</b>
<b>SUBCONTRACTED:</b>													
Earth dams(new)	E/DH	0	0	0	0	2	120	2	120	2	120	6	360
Earth dams(desilt)	E/DH	4	240	4	240	3	180	0	0	0	0	11	660
<b>Subtotal subcontracts</b>		<b>4</b>	<b>240</b>	<b>4</b>	<b>240</b>	<b>5</b>	<b>300</b>	<b>2</b>	<b>120</b>	<b>2</b>	<b>120</b>	<b>17</b>	<b>1020</b>
<b>TOTALS</b>		<b>5</b>	<b>250</b>	<b>8</b>	<b>285</b>	<b>10</b>	<b>350</b>	<b>7</b>	<b>170</b>	<b>6</b>	<b>165</b>	<b>36</b>	<b>1220</b>

TABLE 4.2: MUTITO DIVISION - REHABILITATION AND COMPLETION

Project Name	Location	Project Type	Cost '000 KShs	Total Costs
<b>YEAR 1 - 1990/91</b>				
Kinanie	Endau	R/C	19.46	
Engamba	Endau	E/DH	100.00	
Kwakvai	Endau	E/DH	100.00	
Kwaabaa Kyala	Mutito	E/DH	100.00	
Yulambu	Mutito	E/DH	100.00	
		Summary, Yr 1:	R/C E/DH	1 4
		<b>TOTALS</b>		<b>5</b> <b>419.46</b>
<b>YEAR 2 - 1991/92</b>				
Usungieni	Nuu	E/DH	100.00	
Katiliku	Nuu	E/DH	100.00	
Kasiu	Mutyangome	E/DH	100.00	
Kaabva	Mutyangome	E/DH	100.00	
		Summary, Yr 2:	E/DH	4
		<b>TOTALS</b>		<b>4</b> <b>400.00</b>
<b>YEAR 3 - 1992/93</b>				
Yaandu	Mui	E/DH	100.00	
Kikuu	Zombe	E/DH	100.00	
Kisomo Kyumu	Zombe	E/DH	100.00	
		Summary, Yr 3:	E/DH	3
		<b>TOTALS</b>		<b>3</b> <b>300.00</b>
<b>REHABILITATION SCHEDULE, MOA, CENTRAL DIVISION</b>			R/C	1
			E/DH	11
<b>TOTALS</b>				<b>12</b> <b>1119.46</b>
<b>SITES FOR FURTHER CONSIDERATION:</b>				
Mola Spring	Nuu	S/P	FC	
Kivani		S/P	FC	
Ikisaya		S/P	FC	
Malalani		S/W	FC	
Ngandeni		E/D	FC	

TABLE 5.1: MUTOMO DIVISION - NOWD

TYPE OF W/S	CODE	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
		No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day	No	cum/day
<b>SUBCONTRACTED:</b>													
Earth dams(new)	E/DM	4	240	4	240	0	0	0	0	0	0	8	480
Earth dams(desilt)	E/DM	5	300	6	360	0	0	0	0	0	0	11	660
Subtotal subcontracts		9	540	10	600	0	0	0	0	0	0	19	1140
<b>TOTALS</b>		<b>9</b>	<b>540</b>	<b>10</b>	<b>600</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>1140</b>

Precise scheduling of rehabilitation under KIDP will depend on the activities of MSWCP during 1989/90.

TABLE 5.2: MUTOMO DIVISION - REHABILITATION AND COMPLETION

Project Name	Location	Project Type	Cost '000 KShs	Total Costs
<b>YEAR 1 - 1990/91</b>				
Kasyelia	Mutomo	E/DM	100.00	
Kanzaa	Mutomo	E/DM	100.00	
Syoaukethi	Voo	E/DM	100.00	
Mathangathi	Voo	E/DM	100.00	
Kitulo	Kanziko	E/DM	100.00	
		Summary, Yr 1:	E/DM	5
		<b>TOTALS</b>		<b>5</b>
				500.00
				500.00
<b>YEAR 2 - 1991/92</b>				
Kitwandii	Ikutha	E/DM	100.00	
Kisayani	Ikutha	E/DM	100.00	
Matinga	Athi	E/DM	100.00	
Matinga	Ikanga	E/DM	100.00	
Ndia Ndaasa	Ikanga	E/DM	100.00	
Nguni	Athi	E/DM	100.00	
		Summary, Yr 2:	E/DM	6
		<b>TOTALS</b>		<b>6</b>
				600.00
				600.00
<b>REHABILITATION SCHEDULE, NOWD, MUTOMO DIVISION</b>			E/DM	11
<b>TOTALS</b>				<b>11</b>
				1100.00
				1100.00

Note: see paragraph 7.23 for explanation of costs.

## CHAPTER 8

### LIVESTOCK DEVELOPMENT

#### Objectives

8.1 The following objectives emerged from the MOLD workshop at the Better Living Institute, Kitui, 7 April 1989.<sup>[1]</sup>

##### *Long-Term Objectives*

- a) Improvement of livestock production in Kitui District in the face of increasingly adverse circumstances.
- b) Establishment systems of sustainable land use.
- c) Reduction of the risks and uncertainties faced by farmers by helping them to cope with drought and animal diseases.
- d) Development of self-reliance among farmers.

##### *Immediate Objectives*

- a) Range Management: (i) Establishment of pasture and browse species which will improve stock performance (meat, milk and/or draft) and enhance soil fertility and control/reduce soil erosion and run-off. (ii) Development of stock water facilities.
- b) Disease Control: Reduction of the incidence of animal diseases in the District in all classes of stock.
- c) Livestock Production: Improvement of the overall standard of animal husbandry in the District.
- d) Marketing: (i) Improvement of the marketing of livestock and livestock products as well as inputs. (ii) Assistance to producers with the marketing of livestock in drought-related emergencies.

#### *Target Group*

8.2 Target groups include:

- all farmers, including poor smallstock owners who are exposed to stock losses from epizootic diseases;
- individuals and groups, especially the resource-poor, who need assistance with improving the long-term productivity of their land and animals.

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[1] See Livestock Sector Study, Kitui Arid and Semi-Arid Lands Development Programme, Danida, April 1989, for a full report of the Workshop.



## Rationale

8.3 The principal conclusion of the socio-economic survey carried out as part of the Livestock Sector Study<sup>[2]</sup> was that farmers faced increasing difficulties in raising livestock in Kitui District due to the growing pressure on pastoral resources arising from:

- increased human population and subdivision of land;
- the increase of cropping at the expense of grazing;
- loss of seasonal grazing lands through their permanent settlement or insecurity.

8.4 A second conclusion was that arable and grazing land in Ukambani was more or less taken up and that the opportunities for households to colonise new lands no longer existed. Farmers were increasingly seeking ways of investing their labour in land improvements and fencing their boundaries.

8.5 A third conclusion of the socio-economic survey was that the droughts of the last few decades had been a major factor in the impoverishment of many households who had been forced to sell their stock and land to purchase food and essential items. Some 25 per cent of households had no stock to cushion them against another drought.

8.6 The fourth long-term objective arose from a realisation that Government was not in a position to maintain the level of supporting services provided in the past. Self-reliance or self-help implies voluntary participation by people in the conviction that an activity is in their interest. Subsidies should be avoided as far as possible, not only because of the drain on public resources, but also because they induce people to undertake tasks in which they have no faith.

8.7 There is strong evidence that, consequent upon the growing shortage of land, farmers are increasingly interested in advice on and assistance with land improvement. With improved pastoral management the land could probably support at least double the number of animals except in extremely dry years. Stock water availability has decreased as a result of river beds and wells drying up earlier in the dry season. Public watering points have broken down or have been closed to animals. Farmers (individuals and groups) urgently need help with the planning of on-farm stock-watering facilities.

8.8 Evidence produced by the survey indicated increasing losses from livestock diseases, particularly among smallstock. Improving the capacity of the veterinary services to carry out routine disease control and to respond to outbreaks is essential.

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[2] Socio-Economic Survey of Livestock Keeping in Kitui District, April 1989, Annex 1, Livestock Sector Study.

8.9 The growing scarcity of pastoral resources and the loss of opportunity for seasonal movement provide farmers with new challenges. They need technical advice and assistance to adapt to these changing circumstances, particularly in the fields of nutrition, breeding and animal health.

8.10 Farmers can increase and diversify their sources of income by improving the quality of livestock and animal products. The extent to which off-take can be increased and market opportunities improved by the provision of infrastructure (sale yards, auction yards etc.) is not clear, although holding grounds with water supplies are essential if animals are to be marketed from areas in which quarantine orders are in force and for the off-take of stock in drought-related emergencies.

*Activities Recommended by MOLD*

8.11 The activities specified by the MOLD Kitui Workshop, April 1989, as being necessary to achieve the above-listed objectives were as follows:

(a) Range Management

- demonstration plots in each Division to train government extension personnel and livestock owners (small farmers and groups) on area-specific fodder production and conservation techniques (high potential areas) and range improvement (bush clearing, exclosure, rotational grazing etc.) in lower-potential areas;
- local bulking/multiplication plots to provide grass and legume seed and fodder-tree seedlings to farmers;
- demonstrations of on-farm water storage; construction of off-farm storage (dams, weirs, rock catchments, boreholes etc.);
- field days, barazas and scheduled visits by MOLD extension personnel to organised groups for "method" and "result" demonstrations and advice on stocking rates, etc.;
- advice and assistance to cooperative ranches.

(b) Livestock Production:

- Input supply: improved breeds (e.g. Galla goats, Sahiwal cattle; hybrid cocks) through cost-sharing, cockerel exchange etc.; equipment (coops, hives);
- advice and assistance to individuals and groups on stock management (e.g. feeds and feeding, health, breeding, etc.).

(c) Marketing

- infrastructure (e.g. holding grounds, sale yards, auction yards, abattoirs);
- advice on market requirements and opportunities through advertisements, bulletins, etc.;
- market regulation and grading;
- assistance with the formation and utilization of groups for marketing (including input supply, processing and manufacture, e.g. hides and skins);
- assistance with emergency off-take.

(d) Disease Control

- ruminants: yearly vaccination against CBPP, CAPP, rinderpest, anthrax, black quarter, lumpy skin disease; quarantine to contain foot-and-mouth disease; chemoprophylaxis for stock in areas of trypanosomiasis risk; anthelmintics for helminthiasis; zonal strategic dipping/spraying against tick-borne diseases;
- poultry: vaccination against Newcastle's disease, fowl typhoid, fowl pest; chemoprophylaxis against coccidiosis etc.;
- canines and donkeys: vaccination and baiting to control rabies; anthelmintics to control helminthiasis, etc.

(e) Extension: advice on disease control and animal health.

*Priorities*

8.12 Apart from the general agreement that:

- in future in Kitui District, work with groups of small farmers on their own holdings should receive a higher priority than trying to organise farmers within group ranches, and
- preventive health should receive more emphasis than clinical work throughout the District,

there was an understandable reluctance at the Workshop to set aside any of the standard interventions as being of lower priority. However, given the remoteness of much of the District and the scarcity of manpower and financial resources (see Appendix BA), it is necessary to identify strategic areas for KIDP support in the livestock sector.

8.13 Although a particular activity, for example dairy extension, may not be excluded from the MOLD work programme in Kitui District, its funding is expected to be relatively limited. Similarly, the justification for expenditure on cattle breed improvement is stronger in the more humid upland areas of Central and Mwingi Divisions than in Kyuso, Mutito or Mutomo. On the other hand, advice and assistance in the field of range management, as opposed to the production of fodder crops, is of higher priority in the lower and more arid "millet and livestock" and "ranching"

zones than in the "maize" zone. In the outlying districts, especially Kyuso and Mutito, where people are most dependent on their animals for survival, the administrative infrastructure (e.g. buildings and transport) of the MOLD is most in need of strengthening.

#### *Logistic Support*

8.14 An important conclusion which emerged from the Livestock Sector Study is the difficulty of implementing an expanded work programme without a major investment in administrative infrastructure and transport. This was the experience of the second phase of the USAID Kitui ASAL Project which provided funds for an extended work plan for the MOLD, but failed to make provision for the necessary logistic support.

8.15 Thus under KIDP, high priority will be given to providing the required buildings and transport and operating costs both at Divisional and at District level. This is a precondition for the implementation of even the routine work of the Veterinary and Livestock Production personnel within the District.

#### *Staff Working Conditions and Incentives*

8.16 Clearly, the provision of buildings and transport must go hand in hand with the implementation of an agreed work plan and the re-introduction of routine management procedures. Again, the KIDP-supported programme will start from a narrow base. Currently the MOLD, particularly in the Animal Production Department, are at a virtual standstill because of the depletion of the operating budgets for transport, materials, equipment and travel and subsistence.

8.17 A major objective for the next two years will be the strengthening of the MOLD operational budget at District, Divisional and Locational levels so as to put to work the cadre of recently qualified staff. Funds should also be set aside for further training of staff because the chance of obtaining training opportunities is a powerful incentive to improved performance. This provision is made within the budget of the PMU (unallocated).

#### **Outputs**

##### *Veterinary Department Outputs*

8.18 The first priority in the improvement of livestock production is always the control of epidemic diseases. Little progress in any other field is possible until at least a measure of control has been established. Protection of animals against epizootic diseases, especially smallstock (sheep and goats), is probably the most effective way of helping resource-poor farmers, especially in drought years when animals are particularly prone to disease and when households are most dependent on their stock.

**8.19 CCPP Vaccination:** District veterinary records and the socio-economic survey both indicate that CCPP is on the increase in the District and is a major cause of goat mortality. It is proposed that CCPP prevention and control be financed by KIDP. However, the mass vaccination of goats in the District will require detailed planning, the setting of realistic targets, a work plan which takes account of the size and distribution of flocks within the District, and built-in monitoring and evaluation.

**8.20** In FY1, KIDP will finance a comprehensive field inventory of animal disease in the District, (see Annex F) including clinical and laboratory confirmation to determine the extent and severity of CCPP in the District. If the investigation confirms that CCPP prevention is a high priority, a project document will be prepared which specifies the project objectives and targets, mode of implementation and clearly defines the monitoring and evaluation arrangements for a mass CCPP vaccination campaign in the District. The plan would be prepared in consultation with the Veterinary Department. Particular attention would be given to the following:

- the number of animals to be vaccinated in each geographical zone to obtain the required flock immunity;
- a critical appraisal of the capacity of the laboratories at Muguga to provide CCPP vaccine to the project and the costs involved;
- proposals for pilot trials in PY2 covering one Division in the District, comprising: an evaluation of alternative operational approaches; a pre- and post-vaccination monitoring system, including serological evaluation to test conferred immunity, adverse reactions to the vaccine, etc; an assessment of the likely response of owners and the extension effort needed to prepare stock owners for a wider programme of preventive animal health, including payment for vaccines and drugs.

**8.21** The preliminary investigations, pilot trial and subsequent extension of the programme to the remaining Divisions of the District in PY3 will be supervised by a technically qualified veterinarian (local consultant) who will interpret disease patterns and the effect of vaccination.

**8.22 Mass cattle vaccination:** KIDP will support the resumption of a District-wide mass vaccination programme against Rinderpest and CBPP. This provision would allow the Veterinary Department to use the current allocation for Disease and Pest Control (Code 299 and 513) of about Ksh 200,000 per annum (see Appendix 8A) for the necessary ad hoc measures to control other notifiable diseases (e.g. lumpy skin, Anthrax, Black Quarter). The work plan will take account of the Disease Prevalence Survey to be conducted in the District in FY1 (see Annex F).

8.23 In PY1, the programme would be implemented in two Divisions, and in three Divisions in PY2, etc. By the fourth year, the programme should cover the whole District. The mass vaccination of cattle will require detailed planning, the setting of realistic targets, a work plan which takes account of the size and distribution of herds within the District, and built-in monitoring and evaluation. Details of the coming year's campaign would be set out in the annual work plan and budget in the March preceding the financial year of implementation.

8.24 Hides and Skins: KIDP will support the proper execution of the routine extension work of the H&S Section throughout the District. H&S inspectors in each Division will visit the weekly markets under the supervision of the District H&S Inspector. They will advise producers as they bring their skins for sale to MOLD licensed dealers, whose activities will also be controlled by MOLD staff in keeping with GOK ordinances. Routine reports will be maintained according to the regulations in force. Demonstrations will be conducted by H&S staff at Divisional field days and on other appropriate occasions. The coming year's work plan will be detailed in the annual work plan in the March preceding the financial year of implementation.

#### *Livestock Production Department Outputs*

8.25 Currently, the main problems of the Department (Range, Animal Production and Marketing sections) relate to the lack of office accommodation and transport for routine extension work. The main strategy in each section is to devote the first year to staff training and programme planning so that, when transport and buildings are completed in PY2, implementation can be intensified. The DLPO will be advised and assisted by a Livestock Development Officer (Kenyan Expert) funded by KIDP.

8.26 Range Management: The work of this section embraces the following activities:

- (i) demonstration plots to train government extension personnel and livestock owners (small farmers and groups) on area-specific fodder production and conservation techniques in high-potential areas and range improvement (bush clearing, exclosure, rotational grazing etc.) in lower-potential areas;
- (ii) local bulking/multiplication plots to provide grass and legume seed and fodder-tree seedlings to farmers;
- (iii) demonstrations of on-farm water storage; planning of off-farm storage (dams, weirs, rock catchments, boreholes etc.);
- (iv) field days, barazas and scheduled visits to organised groups for "method" and "result" demonstrations;
- (v) advice and assistance to cooperative and group ranches.

8.27 A detailed work plan and budget will be prepared by Range staff in each Division (in close consultation with the MOA and the relevant farmers' groups at local level) in March 1991 (PY1) for implementation in PY2. The work plan, incorporating the above elements (i) to (v), will be based on the clear understanding that KIDP support to the department is conditional upon close cooperation with the MOA (Soil and Water Conservation) in the planning and implementation of range rehabilitation and fodder production. This applies at all levels, Sub-Local to District.

8.28 During PY1, there will be a strong emphasis on the training of extension staff (Divisional and Locational level), planning demonstration areas, identifying groups and demonstration sites, establishing mother seed multiplication plots and so on.

8.29 Animal Production: The work of this section embraces the following activities:

- (i) input supply: improved breeds (e.g. Galla goats, Sahiwal cattle; hybrid cocks) through cost sharing, cockerel exchange etc; equipment (coops, hives);
- (ii) advice and assistance to individuals and groups on stock management (e.g. feeds and feeding, health, breeding, etc.)

8.30 Goats: Under Phase II of the USAID Kitui ASAL Project, it was proposed to purchase and re-sell improved goats to interested farmers. In the event, the Project found it more straightforward to support the existing Diocese of Kitui GASP Ranch. This programme was reviewed in the course of the Livestock Sector Study and was recommended for further support. However, a decision on the scope and content of such support will have to be the subject of a more detailed review. It is proposed that such a review be carried out in PY1 by the Animal Production Section and that a project document be submitted to KIDP for financing in PY2.

8.31 Poultry: The supply of hybrid cocks is supported in the District by the RDF and the Poultry Development Project. The MSWCP also financed the supply of poultry. It is not proposed to extend direct support to this activity under KIDP without a rigorous evaluation of the situation within the District and the impact of previous interventions. However, staff engaged in poultry extension work would benefit from the improved infrastructural support provided to MOLD by KIDP.

8.32 Bees: The Livestock Sector Study concluded that, with the advent of TARDA support, bee production in the District will be much improved. Assistance by KIDP will be confined to providing the responsible officer at District level with the necessary subsistence allowance and vehicle operating costs to conduct a study in PY1 of:

- (a) the problem of low occupancy of KTB hives (approximately 20 per cent as compared with 90 per cent for traditional log hives);
- (b) the best way to assist women's groups to adopt honey production as a source of off-farm income.

Bee development proposals could then be considered by KIDP during the annual review scheduled for March 1991.

8.33 Crossbred Cattle: KIDP assistance would be confined to logistic support for routine extension work carried out by MOLD staff at District and Divisional level.

8.34 Marketing: The possible interventions within the current free-market situation include the following:

- (a) the provision of infrastructure (e.g. holding grounds, sale yards, auction yards, abattoirs);
- (b) advice on market requirements and opportunities through advertisements, bulletins, etc.;
- (c) market regulation and grading;
- (d) assistance with the formation and utilization of groups for marketing (including input supply, processing and manufacture, e.g. hides and skins);
- (e) assistance with emergency offtake by improving (a), (b) and (d).

8.35 Given the present state of knowledge about the livestock marketing situation in Kitui District, none of the above-listed interventions would qualify for immediate support. It is proposed that during PY1 and PY2, the District Livestock Marketing Officer should carry out the necessary investigations, formulate detailed proposals and submit a project document to the joint GOK/Danida KIDP Evaluation mission planned for the first half of PY3. The study should take close account of the impact of the EDF ASAL Livestock Development Programme<sup>[3]</sup> in Districts to the north and north-east. The study should aim to come up with practical proposals for assisting with emergency offtake in drought years.

#### *Staff Training*

8.36 The DVD and DLPO will be able to draw on the Community Education and Training Section of the PMU to provide orientation for frontline, Divisional as well as District-level staff. Courses and workshops to train staff in specific technical aspects of the proposed programme (e.g. preventive animal health, fodder production and conservation) will also be arranged through the CET Section who would obtain the assistance of specialists from appropriate Kenyan institutions. Training in programme building (community development) techniques will also be provided (see Chapter 5).

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[3] ASAL Livestock Development Programme, Draft Financing Proposal, 6th EDF (Lome III) KE/6009, Commission of the European Communities, Brussels, July 1988.



8.37 Regular staff training sessions are organised under the National Extension Project. These courses are separately conducted for MOLD and MOA staff. The MOA TAs are far more numerous than MOLD TAs, especially in the higher potential areas of Mwingi and Central Divisions. KIDP will seek the cooperation of the implementing ministries with a view to holding regular joint sessions and to devising, testing and implementing an integrated (crops and animals) soil and water conservation package for mixed farms in the higher potential adjudicated areas.

## Inputs

### *Buildings for MOLD*

8.38 Buildings at Divisional Level: Currently the buildings available to the MOLD staff at Divisional level are extremely inadequate. KIDP will finance the construction and equipping of a Livestock Development Centre for the Veterinary and Livestock Production Departments at three Divisional HQs, Kyuso, Mutito and Mwingi. Each unit will consist of basic staff housing, storage, office accommodation and a simple laboratory for field diagnosis. Laboratory samples will continue to be sent to Kabete for more complex investigation.

8.39 Construction will commence in PY1 at all three Divisional sites with the objective of having the centres fully equipped and operational by the middle of PY2.

8.40 Buildings at District Level: The Livestock Production Department is currently borrowing office accommodation from the MOA and the ASAL programme in different parts of the District office complex. The cramped accommodation for the livestock team was reported as a major constraint during Phase II of the USAID Kitui ASAL Project and the situation has not improved since then. The expansion of the ASAL office under KIDP will create additional space for the DLPO and his staff within the existing ASAL complex. KIDP will support the furnishing of this accommodation.

8.41 The expanded mass vaccination programme in the District will create the need for more storage facilities at the District Veterinary HQ. A 56m<sup>2</sup> drug and vaccine store will be constructed and equipped in PY2. Designs and tender documents will be prepared in PY1. Two offices for the Divisional Veterinary Officer, Central District, will be added at the same time.

### *Veterinary Department Inputs*

8.42 District Level: KIDP will finance a disease prevalence survey (see Annex F) and provide the inputs necessary for a District-wide epizootic disease-control programme. In addition to the vehicles provided at Divisional level (see below), a 4WD LWB pick-up and operating costs will be provided for supporting the Divisional teams from the District HQ. The capital costs of equipment and recurrent costs of materials for the vaccination programme are budgeted over the Programme period (See Tables 4.2.1 - 4.2.6, Annex L.) Incremental office operating costs and electricity for refrigeration equipment will also be covered by KIDP up to the limits set out in the financial tables. Operating costs for PY1 are budgeted at 50 per cent of subsequent years in anticipation of a gradual start up.

8.43 Divisional Level: Capital items in Tables 4.2.1 - 4.2.6 include 8 cattle crushes (one per Location), office and laboratory furniture and equipment, a 4WD LWB pick-up for the Div. VO and motorbikes and bicycles for supporting staff. Operating expenses will be provided for transport, materials and maintenance. An allocation of 120 training days a year for chiefs, sub-chiefs, group leaders, etc. is included.

8.44 Veterinary Department Staffing: At District level, per diems for supervisory staff up to a limit of 60 days per year are included. At Divisional level, per diems are budgeted at the rate of 60 days per year for supervisory staff and 30 days per year for frontline staff (see Tables 4.2.1 - 4.2.6, Annex L).

### *Livestock Production Department Inputs*

8.45 District Level: KIDP will provide a 4WD LWB Station Wagon and motorbikes (3) for subject matter specialists in HQ and operating costs up to the level set out in Table 4.2.1. Incremental office running costs and training (120 person days per year) are also budgeted. Operating costs in PY1 are estimated at 50 per cent of subsequent years in anticipation of a gradual start up.

8.46 Divisional Level: Each Division will be provided with three motorbikes, bicycles (8) and a 4WD LWB pick-up during the first two years of the Programme. Transport provision by KIDP in PY2 will be conditional upon the DLPD preparing the work plans in PY1 to justify the expenditure on vehicles. Subject to the same condition, KIDP will provide transport and office operating costs, per diems and Divisional training courses (120 person days per year) for chiefs, sub-chiefs, group leaders, etc.

8.47 Staffing: At District level, per diems at the rate of 60 days per year per specialist have been budgeted. Per diems have also been budgeted for Divisional level staff (see Tables 4.2.1 - 4.2.6, Annex L).

8.48 Livestock Development Officer: A Livestock Development Officer (LDO) will be recruited to assist in the KIDP livestock development programme. The LDO will be assigned to work with the DLPO in the MOLD but will be recruited through the PMU (in consultation with the MOLD) and will come under the professional supervision of the PC/PO. A job description for the LDO is in Annex E.

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**APPENDIX 8A: MOLD - VETERINARY DEPARTMENT STAFF AND RESOURCES**

At District level, MOLD is subdivided into two Departments, Veterinary and Livestock Production, each responsible to departmental heads in Nairobi HQ. This Appendix deals with the Veterinary Department, while Appendix 8B deals with the Livestock Production Department.

Staff Establishment of the Veterinary Department in Kitui District

Group	No.	Post	Deployment
M	1	Senior Vet. Officer	District
L	5	Veterinary Officer I	District and Division
K	3	Veterinary Officer II	Division
G	6	Livestock Officer III	District (1) Division (5)
G	1	Executive Assistant	District
F	56	Animal Health Assistant	Division
D	11	3 Drivers, 8 Clerical	Division and District
A-C	54	Subordinate staff & and drivers	Division and District

Note: Estimated annual cost of wages and salaries: Ksh 180,540

Physical Resources of the Veterinary Department, Kitui District

Transport	Number operational
4WD vehicles	1 in good condition, 5 in poor condition - over 7yrs
Lorries	(1 non-operational, over 7 yrs old, estimated cost of repair: Ksh 60,000)
Pick-up	1 in poor condition, over 7 yrs old
Motor cycles	2 (1 over ten years old, unreliable)

Buildings	Offices m <sup>2</sup>	Houses no.
Kitui HQ		
AI Clinic		
Mwingi Division	4.5	2 LG
Kyusu, Northern Division	9	nil
Mutito, Eastern Division	48	nil
Mutomo, Southern Division	47	1 MG
Central	12	nil

Veterinary Department Budget, 1988/89, Ksh

Project Code	Project Name	Allocation
<u>Recurrent</u>		
299	Disease and Pest Control (control of notifiable diseases)	78,040
286	District Veterinary Services (general overheads)	148,360
287	Veterinary Clinical Services (principally drugs - antibiotics, anthelmintics - and transport)	311,640
275	Artificial Insemination (transport and staff subsistence)	224,220
293	Hides and Skins Improvement (transport and staff subsistence)	27,740
sub total		790,000 (K& 39,500)
<u>Development</u>		
299	Range Areas Veterinary Services (goats, CCPP and poultry)	110,000
299	Rabies Control (transport and staff subsistence)	69,100
513	Veterinary Clinical Services (see above)	11,000
513	Management Support and Training (transport and staff subsistence)	53,440
513	Disease and Pest Control (see above)	129,920
sub total		373,460 (K& 18,673)
Total		(K& 58,173)[1]

[1] 32 per cent of salaries and wages

**APPENDIX 8B: MOLD - LIVESTOCK PRODUCTION DEPARTMENT STAFF  
AND RESOURCES**

The District Livestock Production Department has three sections (Animal Production, Range and Marketing) which parallel national and provincial-level organisations. Each is headed by a specialist officer. Each of the five Divisions within the District is headed by a graduate or diplomate Divisional Livestock Extension Officer. There is also an Assistant Range Officer in each Division. Technical Range Assistants and Technical Assistants are posted at the locational level.

Staff Establishment of the Livestock Production Department

Group	No.	Post	Deployment
L	3	District Livestock Production Officer District Range Officer Range Officer (I) (study leave)	D D
K	4	District Animal Production Officer District Livestock Marketing Officer District Range Planner District Livestock Project Coordinator	D D D D
G	19	Assistant Range Officer (9) Assistant Animal Production Officer (8) Executive Officer Supplies Assistant	Dv Dv D D
F	31	Technical Range Assistant (21) Technical Assistant (8) Animal Health Assistant (2) (seconded)	L L BLI
D/E	4	Clerical Officer (4)	D
1-3	5	Driver (5)	D
B	1	Junior Technical Range Assistant	L

D: District, Dv: Division, L: Location, BLI: Better Living Institute

Note: Estimated annual cost of wages and salaries: Ksh 120,858

One of the immediate effects of forming a separate ministry for the livestock sector in 1988 was the disruption of administrative procedures and loss of office space and vehicles. Nowhere is the problem more acutely felt than in the District HQ in Kitui where small offices, on temporary loan from the USAID ASAL project, are shared by five or six officers. At the Divisional level, staff are housed in the honey collection centres constructed under Phase II of the USAID ASAL Project.

Physical Resources of the Livestock Production Department

Transport	Number operational	Non operational
4WD vehicles	1	2
Lorries	-	-
Water Tanker	-	-
Pick-up	1	1
Tractor	-	-
Motor cycles	2	3

Buildings	Offices m <sup>2</sup>	Stores	Houses no.
Kitui HQ (on loan from MDA)	1 x 25	-	-
(on loan from ASAL)	4 x 8	-	-
Mwingi Division	-	1 (HCC)	-
Kyuso (Northern) Division	-	1 (HCC)	-
Mutito (Eastern) Division	-	1 (HCC)	-
Mutomo (Southern) Division	-	-	-
(on loan from MDA)	1	-	-

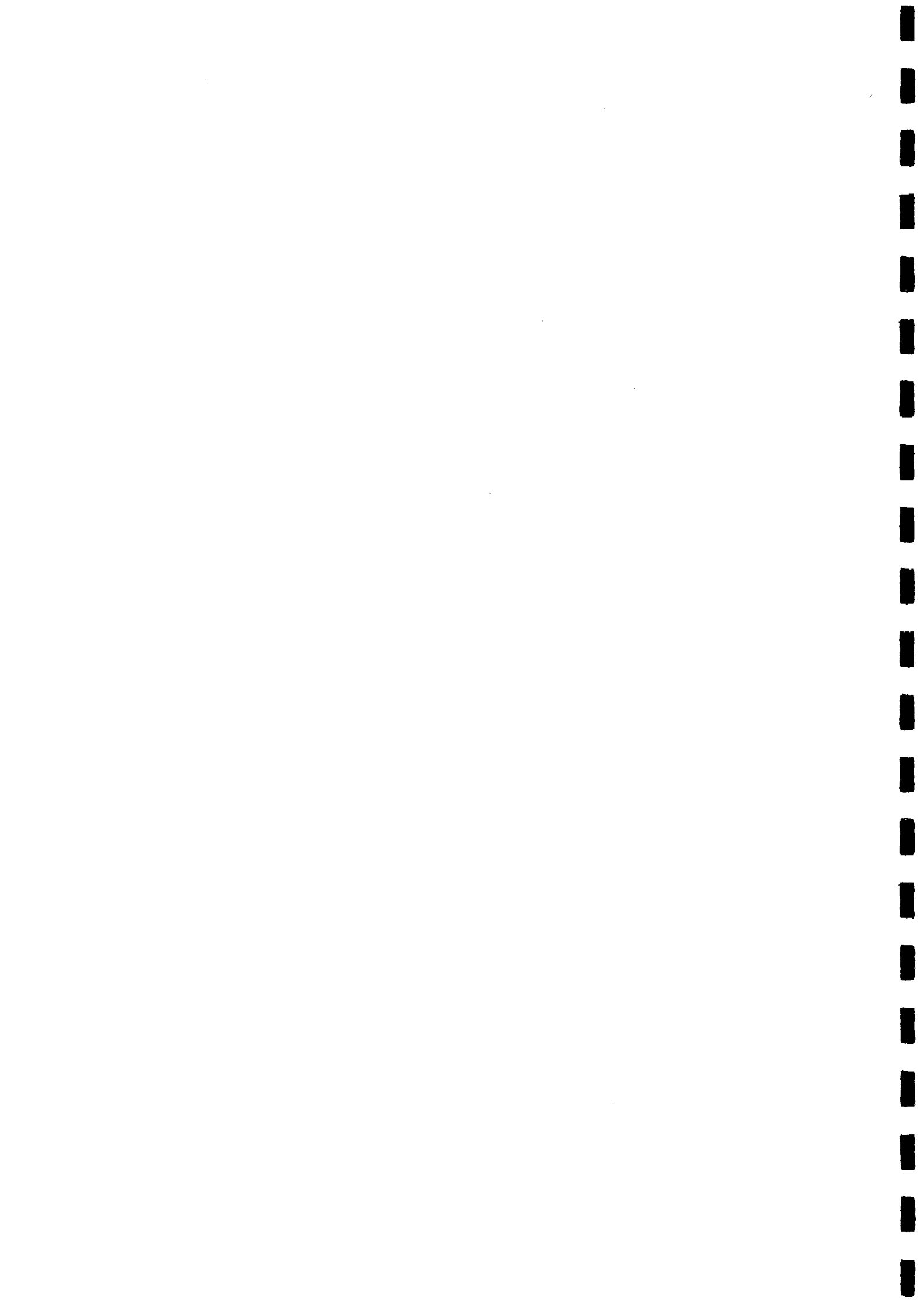
(HCC = honey collection centre)

Livestock Production Department Budget, 1988/89, Ksh

Project Code	Project Name	Allocation
<u>Recurrent</u>		
269	District Administrative Services	64,600
273	District offices, Animal Production	27,800
278	District Livestock Marketing Services	14,720
279	Holding Ground Services	4,480
297	Ranch Management Services	105,800
394	District Livestock Education & Extension Services	50,600
sub total		268,000
		(K£ 13,400)
<u>Development</u>		
280-046	Poultry Development Project	59,920
512-000	National Extension Project	257,400
sub total		317,320
		(K£ 15,866)
Total		(K£ 29,266) [1]

[1] 24 per cent of salaries and wages





## CHAPTER 9

### FORESTRY

#### Objectives

9.1 Within the overall Programme objectives, KIDP will assist the District Forest Department with a view to:

- a) conserving the catchment areas of perennial springs;
- b) producing and distributing seedlings for on-farm tree-planting and, where necessary, for hill-top conservation;
- c) supporting the RAES which aims to increase community participation in tree planting and conservation measures.

#### Target Group

9.2 Target groups will include:

- upstream and downstream populations within and below specific catchment locations;
- individuals, groups and institutions, especially those in the more densely populated parts of the District where natural resources are under most pressure;
- the staff of the District Forest Department, especially the frontline staff, for the purpose of both technical and management (public relations) skills training.

#### Rationale

##### *Conservation of Hill Catchments*

9.3 Almost all springs in Kitui District are located high in the hills and are found mainly in five areas: Mumoni, Nuu, Endau, Mutha and on the north-south ridge separating Central and Mutito Divisions. In order to protect these valuable water sources, which are to be developed with KIDP resources, it is a matter of urgency that conservation measures be undertaken by the Forest Department within the catchment areas of perennial springs.

9.4 The hills gazetted as forest reserves - Mumoni, Nuu, Mutito, Museve, Kyawea and Kabonge (See Appendix 9A) - are all well protected under the Forest Act enforced by the Forest Department.<sup>[1]</sup>

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[1] Kitui-ASAL Development Programme, Forestry Component. Nils Kjølsten, Technical Adviser to Danida, September 1988. (See Annex 11, Kitui-ASAL Appraisal Report, April 1989.)

9.5 Of the remaining hills identified as important water catchments, Endau, Mutha and Mutuluni are surveyed, but not gazetted as forest reserves. Of these the spring catchment on the prominent inselberg of Endau, in an otherwise waterless part of Mutito Division, is deteriorating due to widespread farming in the upper zones along the crest. Until a decade or so ago, the hill was free of cultivation but population pressure and a run of dry years on the plains below have resulted in increasing encroachment on the catchment reserve, where the humid forest soils are greatly valued by local people for yam and vegetable growing.

9.6 It is difficult to justify closure to subsistence farmers who see reservation as a denial of their traditional rights to grazing and cultivation. Their marginal economic situation does not incline them to show interest in the fate of others living downstream; they do not know or care about the importance of regulated flows of clear water. Planning, implementation and follow up requires a strong technical capability, political commitment and popular support.

9.7 These inselberg and hill-top forests are generally too remote for economic timber extraction and are best re-established as catchment reserves by closure and protection from grazing, cultivation and bush fires so as to allow natural regeneration of woody species to take place. Soil and water conservation measures (e.g. micro-catchments) and replanting should be carried out only in those areas where the vegetation cover has been degraded and the topsoil removed.

#### *Forestry in the Lowland Semi-Arid Areas*

9.8 It is now clear (which it was not twenty years ago) that tree plantations in Kenya are unsuccessful in areas with less than 800mm of rainfall, except where trees can be irrigated. Under these conditions "fast-growing" exotics grow scarcely faster than the pre-existing vegetation and are out-performed by indigenous species in drought years. As a result, the low esteem in which bushland used to be held is giving way to the recognition that previous estimates of natural woodland productivity may have been too low and that, even at low increment levels, there are tens of thousands of hectares to be exploited for charcoal.<sup>[2]</sup> Most indigenous arid zone trees and shrubs continue to grow even when browsed, burned and coppiced, and more protection leads to much increased productivity.

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[2] The Kenya Rangeland Ecological Monitoring Unit (KREMU) conducted a vegetation survey in the District as part of the USAID-funded Kitui District Water Resources Study (Volume 4, Annex F, Environmental Analysis, Louis Berger Int. Nairobi, 1983). They concluded that much of the lowland bush country could be usefully and profitably exploited for charcoal production on a sustained yield basis under the control and supervision of the Forest Department.

9.9 Good rains for Acacia establishment only occur every decade or two and woodlands tend to consist of large numbers of even-aged trees. The need is to ensure that more young established seedlings and saplings survive to adulthood. It is estimated that such protection would probably be hundreds of times more effective in reafforesting the arid zone than attempts to plant trees.

#### *Nurseries and Agroforestry*

9.10 Agroforestry should play an important role in improved agricultural practices in the more humid, upland areas of the District. Planting of fodder, fruit, timber and shade trees is encouraged by MENR, MOA and MOLD and strongly supported by national leaders. The practice is readily accepted by farmers in those areas where much of the land is already subdivided into family farms and where there is a shortage of firewood and poles. In the drier, lowland areas, there is much less incentive to plant and care for seedlings as supplies of fuel and building material, although depleted, are still readily available on unenclosed land.

9.11 Because of the problems involved in distributing seedlings in a brief period during the rains, when farmers are busy sowing crops, only those people in the vicinity of the nursery can be effectively reached.

9.12 One of the major problems which has to be addressed by those recommending agroforestry in the drier lowland areas is the issue of common property rights (CPRs). Rural people usually want to plant trees only on permanently owned land, often only as a cash crop, and only where land in general is so short that there is no state or communally-owned bush or forest nearby from which tree products may be taken without the trouble of growing them. In the drier lowland parts of Kitui District, this rules out the likelihood of successful villager tree-planting projects. Forests and woodlands, though dwindling, still cover thousands of hectares and will continue to be used by the populations who live near them for most purposes for the foreseeable future. The District's Acacia woodlands are fairly heavily used, in part as CPRs. In these areas trees are generally stunted, grass-cover is sparse, and trees are extensively used for browse by domestic animals in addition to meeting a variety of human needs. Vegetation is often ruthlessly cleared for cultivation.

9.13 Thus for both practical and ecological reasons, the Forest Department gives priority to the development of nurseries and the promotion of agroforestry in the more densely settled areas of Central and Mwingi Divisions.

*The Rural Afforestation Extension Service (RAES)*

9.14 The RAES, under the District Forest Extension Officer, Divisional Forestry Extension Officers and Technical Officers at Locational level, is the principal government agency charged with forestry extension. In this respect, the role of the other line ministries, e.g. Agriculture and Education, is to supplement the work done by the Forestry Department. However, in parts of the District, for example in Mutomo Division where the MSWCP has established separate nurseries under the MDA, the Forest Department is no longer pre-eminent in forestry extension. Project-run nurseries lie side by side with Forest Department nurseries and compete for scarce funds for inputs. In many instances the nurseries are "supply" rather than "demand driven" and over-mature seedlings are left unplanted from season to season.

9.15 The primary aim of the RAES is to impart tree-growing skills to farmers and promote simple and inexpensive but effective methods and materials. It is the policy of the Kenya Forestry Department<sup>[3]</sup> to have at least one Technical Officer in each Location and one nursery in each Division. These are meant to serve primarily as demonstration nurseries. As such they should be well run, have a maximum diversity of agroforestry species well adapted to the local conditions and local needs, act as seed orchards and experiment with technically difficult species.

9.16 RAES nurseries should also serve as storage and distribution depots for materials in support of tree-planting groups and individuals. RAES should not aim to increase steadily the number of seedlings it distributes, but rather to increase the quantity and quality of tree seed it makes available to farmers and groups.

*Resources of the District Forest Department*

9.17 The diversion of funds into the agroforestry enterprises run by other agencies has seriously affected the capacity of the DFD to carry out his routine regulatory and extension functions. Currently there are only three forestry vehicles operational in the District (see Appendix 9B). These are frequently off the road as they are all over ten years old and in need of major overhaul. The situation is made more difficult by the fact that departmental vehicles are required to travel to remote areas on unmade roads at all times of the year.

9.18 The Forest Department annual report for 1988 comprises a long catalogue of activities which failed to take place for lack of funds. The recurrent budgetary allocation for the DFD (1988/89) (see Appendix 9C), who controls 335 staff (see Appendix 9D) amounts to Ksh 554,000, about one tenth of the bill for salaries and wages (about Ksh 5.4 million annually).

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[3] "Policy of the Forest Department in Social Forestry", C R J Nyaga, Director of Forestry. Kenya National Social Forestry Seminar, Muruga, August, 1988.

## Outputs

### *Regulatory Functions*

9.19 KIDP will provide infrastructural support to the District Forest Department (transport and offices at Divisional level) to enable it to carry out its regulatory functions within the District better, especially the policing of gazetted reserves and the gazettelement of important catchments which remain outstanding (Appendix 9A).

9.20 The DFO will be able to call upon the services of the Community Education and Training Section of the PMU for the purpose of mobilising popular support for particular conservation measures in specific catchment areas.

### *Agroforestry Extension*

9.21 KIDP will support the RAES as the main Government organisation for the promotion of agroforestry extension in the District. Initially, resources will be provided for the rehabilitation of Divisional nurseries in Central and Mwingi Divisions (Nzeeu and Nzelui). Nurseries in these Divisions will receive priority over the nurseries in drier, lower-potential Divisions. The nurseries of institutions and groups within these Divisions would qualify for material support from the RAES with resources provided by KIDP.

9.22 Subject to the agreement of the DAD Kitui, the KIDP budget for the running of the school nursery programme and the central nurseries in Mutomo Division will be transferred to the DFO. This will allow the rationalisation of the nurseries in Mutomo where MOA and Forest Department exist side by side.

## Inputs

9.23 Tables 5.1.1 - 5.1.6 in Annex L show the forestry budget for the Programme period. The budget for PY2 to PY5 is indicative and will be reviewed in March 1991 in the course of the annual programming and budgeting exercise.

9.24 The main expenditure at District level is for vehicles (two 4WD long-wheel-base pick-ups - one each for the DFO and the DFEO - and running costs (30,000 km per year per vehicle) and a tractor for use in transporting nursery materials and clearing firelines in Central and Mwingi Divisions. KIDP will meet the cost of per diems up to 120 days per annum for the DFO and the DFEO, or other staff at the discretion of the DFO and DFEO.

9.25 At the Divisional level, KIDP will provide motorbikes, bicycles and operating costs for Divisional Forestry extension staff throughout the District, but support to nurseries and group nurseries will initially be confined to Mwingi and Central Divisions. The Forest Department will be provided with an office and store (28 square metres) in the KIDP office blocks at Kyuso, Mwingi and Mutito.

9.26 Per diems will be provided to Div.FEOs up to a total of 60 days per year. This will enable them to attend District training sessions and carry out regular field supervision of TOs. Per diems will be paid to frontline staff (TOs) - 30 days per year - to enable them to attend routine training sessions at Divisional and District level.

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## APPENDIX 9A: GAZETTING OF WATER CATCHMENTS

### Surveyed and Gazetted Hills

Division	Name	Area (ha)
Central	Museve	48.2
	Kyaweia	63.2
	Kabonge	31.8
Kyuso	Mumoni	10441.0
Mutito	Mutito	1958.7
	Nuu	3533.0
	Engamba	3222.3
	Makongo	3431.8
Total		22730.0

### Hills Surveyed but not Gazetted

Division	Name	Area (ha)
Central	Mutuluni	596.0
Kyuso	Gaikuyu	3075.0
	Maai	769.0
Mutito	Endau	6718.0
	Imba/Chakuyu	1377.0
Mutomo	Mutha	2469.0
	Nzoani	596.0
Total		15600.0



Proposed Hills for Gazetting

Division	Name	Area (ha)
Central	Ilima Yimwe )	40.0
	Kwavonza )	
	Mwakini )	
	Maavani )	
Mutito	Mutaitho	5000.0
	Kimongo Valley	2500.0
	Nzanzu	2000.0
	Kyamba Mui	5000.0
	Kyui Range	1000.0
Mutomo	Ndoani	13800.0
	Tendelu	1700.0
	Mbiti	1500.0
	Ngali	1600.0
	Kanyunga	12700.0
	Maungu	13900.0
	Kyongoani	5800.0
	Nzaayani	13600.0
Maimu	560.0	
Total		80700.0

Source: Danida Kitui ASAL Appraisal Report, Forestry Component  
(September 1988), Annex 5.

## APPENDIX 9B: FOREST DEPARTMENT VEHICLES

<u>Licence no.</u>	<u>Type</u>	<u>Station</u>	<u>Condition</u>
GK. 722U	Landrover (LWB)	DFD	Serviceable with minor repairs
GK. 380R	Isuzu Lorry	DFD	" " " "
GK. 884U	Toyota Hilux	Kitui	Grounded throughout year
GK. 743U	Tractor	Kitui	Grounded at DFD's office
GK. 932U	Trailer	Kitui	Grounded at Mumoni Station
GK. 885U	Toyota Hilux	Mumoni	Serviceable with frequent repairs
GK. 424L	Landrover (SWB)	Mutito	Grounded throughout year
GK. 186R	Lorry	Mutomo	Unserviceable
GK. C263	Tractor	Mutomo	Grounded at Mutito
GK. D474	Trailer	Mutomo	Serviceable
GK. 863U	Toyota Hilux	DFED/Kitui	Serviceable
GK. L884	Motorcycle	DFED/Kitui	Serviceable

In addition, 10 bicycles in use in extension work.

Source: Ministry of Environment and Natural Resources, Forest Department, Kitui District, Annual Report 1988 (published February 1989).



## APPENDIX 9C: FORESTRY BUDGET 1988/89

### DFO Kitui Recurrent Budget 1988/89

	K£
Passage and leave expenses	420
Transport and operating expenses	5000
Travel and accommodation expenses	1175
Postal and telegram expenses	144
Telephone expenses	160
Electricity, water and conservancy	190
Purchase of supplies for production	1000
Fungicides, insecticides and sprays	200
Uniforms and clothing	245
Purchase of stationery	700
Maintenance of plant machinery and equipment	250
Maintenance of buildings and stations	400
Maintenance of roads	300

Total 10184

DFEO: RAES Recurrent Budget 1988/89 6540

Development Budget ASAL 11000

Total 17540

Total budget for District (DFO and DFEO)  
(operating expenditure) 27724

Salaries and personal emoluments for staff 185709

Total 213433

Operating expenditure as percentage of total: 13%

Source: Forest Department



APPENDIX 9D: FOREST DEPARTMENT STAFF DEPLOYMENT

<u>Station</u>	<u>DFD</u>	<u>CF</u>	<u>Foresters</u>	<u>F/Asst</u>	<u>F/Guards</u>	<u>Workers</u>	<u>Tech. Officers</u>	<u>CO</u>	<u>Drivers</u>	<u>Typists</u>	<u>Mess-engers</u>	<u>Store-men</u>	<u>TOTAL</u>
DFD's Office	1	3	-	-	-	-	-	4	-	2	3	1	14
Mutomo	-	-	1	-	4	30	3	2	2	1	1	1	45
Mutito	-	-	1	1	4	70	4	1	1	1	1	1	85
Mumoni	-	-	1	1	7	33	2	1	1	1	1	1	49
Mvingi RAES	-	-	4	-	-	50	5	1	1	1	1	1	64
Kitui	-	-	1	1	11	48	12	1	1	1	1	1	78
<b>TOTAL</b>	<b>1</b>	<b>3</b>	<b>8</b>	<b>3</b>	<b>26</b>	<b>231</b>	<b>26</b>	<b>10</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>6</b>	<b>335</b>

Source: Forest Department