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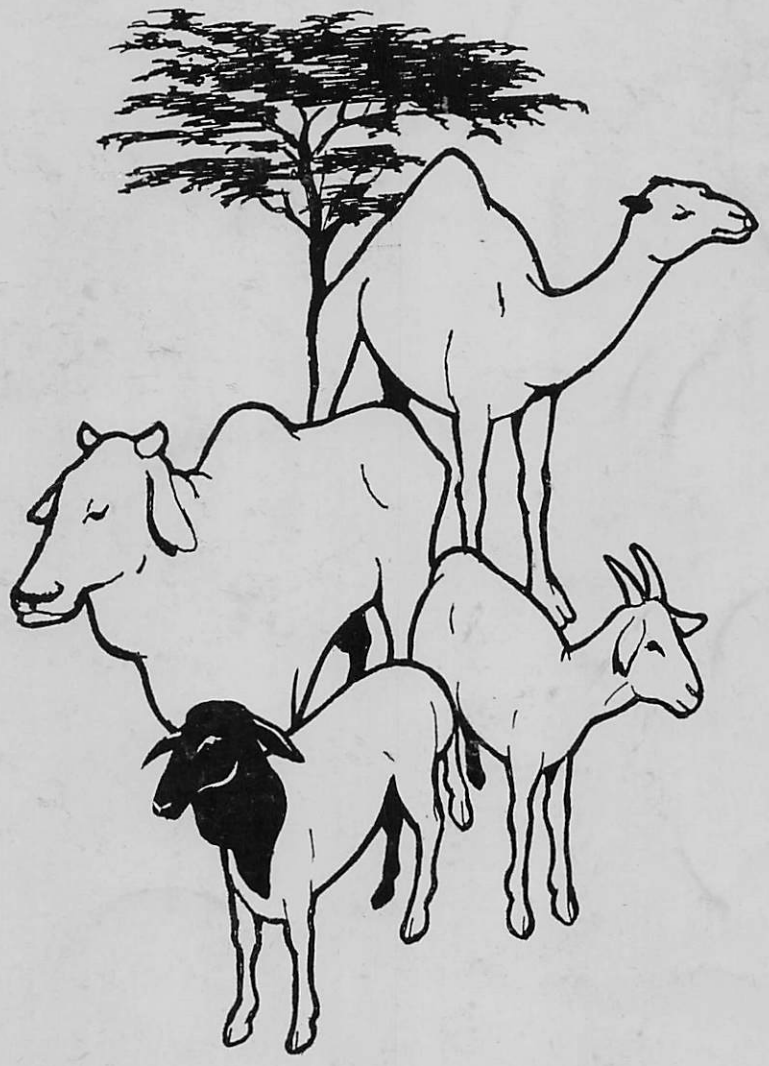
SOMALI DEMOCRATIC REPUBLIC

NATIONAL RANGE AGENCY

CENTRAL RANGELANDS DEVELOPMENT PROJECT

PHASE II — PROJECT PREPARATION REPORT



MAIN REPORT

CENTRAL RANGELANDS DEVELOPMENT PROJECT

PROJECT PREPARATION COMMITTEE

SOMALI DEMOCRATIC REPUBLIC

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FINAL

MAIN REPORT

DECEMBER, 1986

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PROJECT PREPARATION COMMITTEE

LIST OF ABBREVIATIONS

AFWTC	Afgoi Forestry and Wildlife Training Centre
APC	Agro-Pastoral Complex
CGDP	Comprehensive Groundwater Development Project
CRDP-I	Central Rangelands Development Project Phase I
CRDP-II	Central Rangelands Development Project Phase II
DALF	District Arid Land Forester
DEO	District Extension Officer
GOS	Government of Somalia
GTZ	Deutsche Gesellschaft fur Technische Zusammernarbet
IDA	International Development Association of World Bank
IFAD	International Fund for Agricultural Development
ILCA	International Livestock Centre for Africa
MLFR	Ministry of Livestock, Forestry and Range
NRA	National Range Agency
PMU	Project Management Unit
RLA	Range and Livestock Association
SAPRWS	Saudi Arabian Programme for Rural Water Supply
SIMP	Systems Investigation and Monitoring Programme
T & V	Training and Visit - Extension Methodology
USAID	United States Agency for International Development
VEW	Village Extension Worker
WDA	Water Development Authority
WFP	World Food Programme

CURRENCY AND EQUIVALENT UNITS

Somali Shillings (SoSh) = 100 cents

US$1.00 = SoSh 85

FISCAL YEAR

January 1 - December 31

CENTRAL RANGELANDS DEVELOPMENT PROJECT

PHASE II

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I. INTRODUCTION

1.01 A mid-term review of phase I of the Central Rangelands Development Project (CRDP) was carried out in March, 1984. It was concluded that changes were needed in the approach to development in the Central Rangelands and the Government of Somalia requested the appointment of consultants to assist with strategy reformulation.

1.02 In February, 1986, the consulting firm Mascott Ltd. submitted a final report on "Possibilities for Further Activities in the Central Rangelands". Concurrently at a meeting between representatives of Government and donors, a joint decision was made to hold an international seminar and workshop in Mogadishu from March 24 to 27, 1986, on "Future Range/Livestock Development Strategies for the Central Rangelands of Somalia". The seminar participants: senior project staff, Government officials, representatives from donors and selected independent consultants, concluded that significant progress had been made in CRDP-I and endorsed a range of future activities.

1.03 In order to maintain the impetus created by the Mascott report and the international seminar/workshop, CRDP formed a Project Preparation Committee 1/. This committee produced a draft design for CRDP-II in September, 1986. The draft concentrated on the physical and technical aspects of the proposed project, but did not include production estimates, economic analysis and cost estimates. The committee was augmented on October 15th, 1986, by two consultants 2/ whose specific responsibility was to assist with the preparation of phase II by finalising the project preparation report, in conjunction with other members of the committee, to standards acceptable to international donors.

1/ Messrs. Dahir Abby Farah (Project Manager, CRDP), R. Holt (Chief Extension Officer, CRDP), D. Herlocker (Range Ecologist, CRDP), and A.C. Malia (Financial Controller, CRDP).

2/ Messrs. C.M. Giles (Team Leader, Range/Livestock) and P.M. Young (Livestock Economist) from Australian Agricultural Consulting and Management Company Pty. Limited (AACM).

II. BACKGROUND

A. THE AGRICULTURAL SECTOR

2.01 Somalia's agricultural sector, on average, contributed 52% of GDP during the period 1970-1984, with livestock accounting for 35%, crop production 11%, forestry 5% and fisheries less than 1%. The sector provides about 80% of employment (at least 60% in the livestock subsector) and up to 99% of merchandise exports, with livestock accounting for 90% and bananas 6-7%.

2.02 Agricultural performance in Somalia in recent years has been disappointing. Over the 15 years to 1984, sectoral output grew by only 0.4%, per year, slightly more rapidly in the livestock sector and considerably slower in the crop sector. Per capita food production declined during these years by about 3% per year and the country's dependence on imported grains rose from 40,000 to 350,000 tonnes. Investment in the sector (nearly $600 million) during these years has contributed to Somalia's present external debt ($1,500 million). This debt has resulted in an extreme balance of payments/foreign exchange shortage, made worse by the large food imports and the ban in 1982 on Somalia's exports of livestock to its major market.

2.03 As a result of these developments, Somalia is now dependent to a very high degree on external assistance which supports 100% of the public investment programme, an important element of the domestic operating budget, and nearly $100 million in technical assistance (over 1,200 people)[1/].

2.04 Somalia has, since 1980, introduced major economic policy changes which have progressively improved the performance of the agricultural sector. These policies have aimed at moving towards a mixed and more private economy, liberalising internal marketing, devaluing the Somali shilling, liberalising foreign exchange controls and reducing the involvement of the public sector in commercial ventures. These changes provide an opportunity to remove some of the previous constraints to agricultural growth, although the reforms are far from complete and new problems have arisen.

2.05 The physical and environmental constraints are significant. The limit to expanding livestock numbers is being reached (or perhaps exceeded) and Somalia's

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1/ IBRD Agricultural Sector Survey, 1986.

arid/semi-arid climate with limited bi-model rainfall constrains the area of rainfed cropping. The increasing human population (3.1% per annum) adds further pressures.

2.06 Public sector performance is poor and unless steps can be taken to motivate and retain key staff in the Ministries, manpower and training programmes are of little purpose. Input supply is slowly being returned to the private sector, but costly public sector enterprises continue to impede material flows, disrupt agricultural production and marketing, and reduce the resources available to the private sector.

2.07 The livestock subsector is, and will continue to be, the major contributor to GDP, employment and exports. The present pressure on resources may be such as to effectively preclude significant long-term increases in the number of animals, particularly in the rangelands.

III. PROJECT AREA[1/]

A. LOCATION AND POPULATION

3.01 The project area comprises the Central Rangelands of Somalia and is located between latitudes 3 degrees 10 minutes N and 7 degrees 40 minutes N, and is bordered to the east by the Indian Ocean and to the west by the border with Ethiopia. It covers an area of 149,000 km^2, or about 25% of the national area and 43% of the Rangelands, and comprises the three administrative regions of Hiran, Gulguduud and Mudug (refer Map 1). The population of the project area is about 700,000 people or some 12% of the estimated total population of 5.8 million.

B. PHYSIOGRAPHY AND GEOLOGY/GEOMORPHOLOGY

3.02 The Central Rangelands is a slightly inclined, often almost featureless plain rising slowly but steadily from sea level north-westward to elevations of 300-400 metres along the Ethiopian border. Only in the extreme north are elevations of 600-700 metres attained. Only two major features break this physiographic uniformity. The first is the Shebelle River valley which cuts north to south in the far south-west of the Central Rangelands and is bordered by a low but abrupt escarpment. The second is a 300-500 metre high ridge, extending from south-west, which fronts the sea - 20 km inland - for about 350 km. This ridge has blocked the otherwise dominant south-eastward drainage of surface water. Outside of the Central Rangelands and to the south this has forced the Shebelle River southward. Within the Central Rangelands it has created closed internal drainage basins along its north-western flank resulting in stagnated drainage and the development of gypsic and anhydrite soils in limited areas.

C. CLIMATE, SOILS, WATER, VEGETATION AND WILDLIFE

3.03 Overall, the climate of the Central Rangelands is not well described. Meteorological stations are few and poorly distributed. The climate is warm throughout the year (20°-30°C) except for parts of the interior where temperatures exceed 30°C during the summer months. Mean annual rainfall ranges from about 300 mm/yr in the south-west to under 150 mm/yr in the north-east. Rainfall occurs in two rainy seasons. About 60% falls during the Gu season

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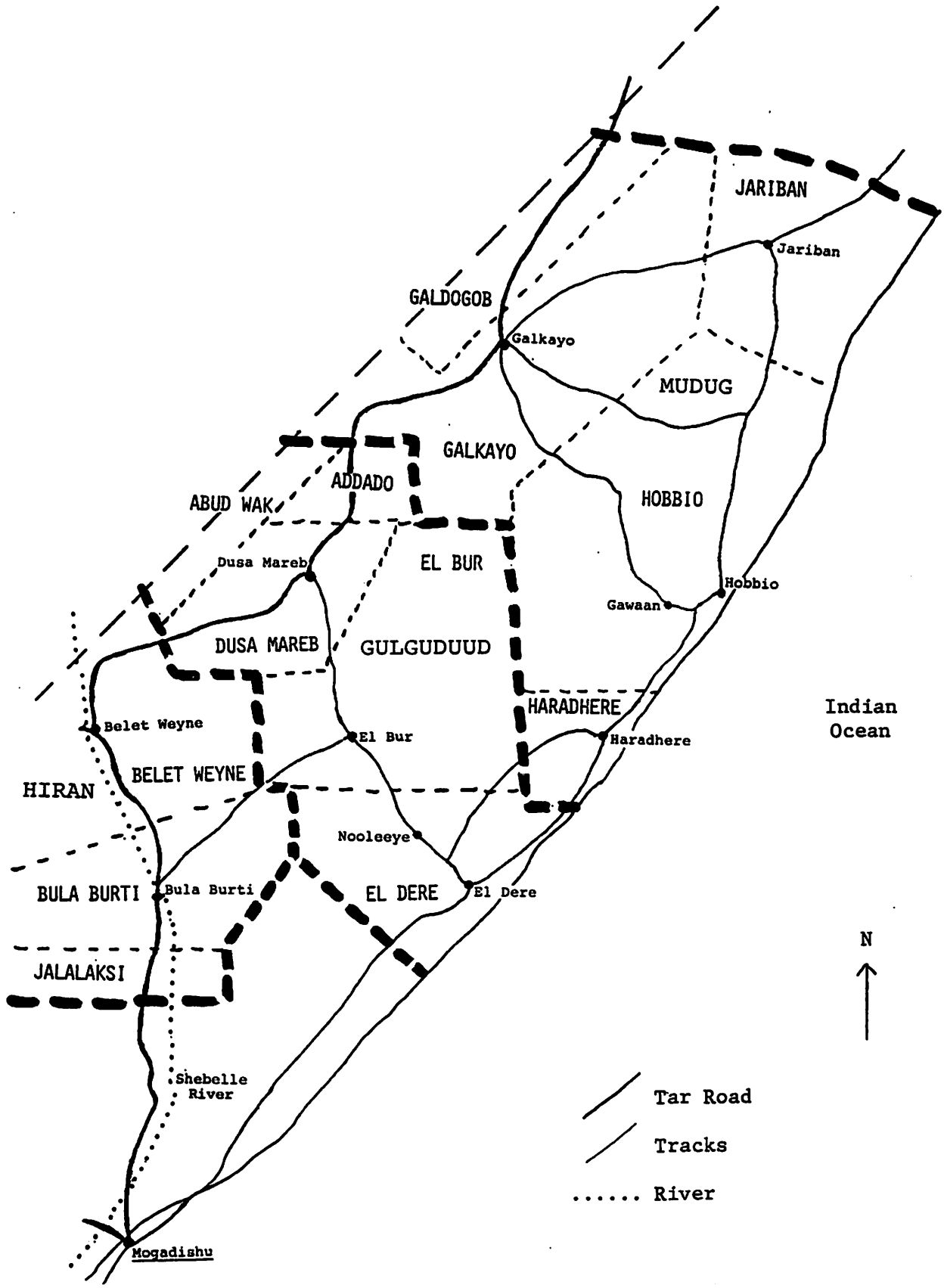
1/ The terms Central Rangelands and project area are essentially synonymous.

MAP 1 : PROJECT AREA



(approx. April-May). The rest falls during the Deyr season (approx. November-December). There is little topographical influence on rainfall except that the coastal ridge appears to be associated with either increased rainfall or decreased evaporation due to the cloud cover, or both.

3.04 The wind system is monsoonal and consists of two directly opposed winds, the south-west and the north-west monsoons which occur in different seasons. Of the two, the south-west monsoon is the strongest and has the greatest overall influence over the climate, and in the direction and movement of sand dunes. Wind speeds are high during the dry seasons, reaching up to 30 km/hr. Wind speed increases northward in the same direction as rainfall decreases. This exacerbates the aridity of the north and north-east so that there is a distinct south-west to north-east gradient of increasing aridity. Overall, rainfall is estimated to equal - at best - only 20% of the annual potential evaporation.

3.05 Generally, the soils are sandy, reddish brown to reddish yellow in colour and alkaline to neutral in pH. Depth is related to parent material: shallow (less than a metre deep) over limestones and gypsum; shallow to medium (up to 2 metres deep) on sands overlying limestones and generally deep elsewhere. There is no definitive information available regarding soil fertility.

3.06 Wind is the principal erosive factor in the Central Rangelands and is a major shaper of the landscape. Sandy soils are easily destabilised once their vegetative cover is removed and dune formation may occur rapidly thereafter. Unstabilised sand dunes and large dune fields are particularly common within 80 km of the coast where they cover large areas. Water erosion is only locally important and is limited to those areas where slopes occur and silt in the sand allows surface compaction. The main areas where water erosion occurs are the escarpments of the Shebelle Valley and the large areas on the ridge at the back of the coast. In these areas gully erosion is often in an advanced stage.

3.07 Surface water supplies are not abundant. The Shebelle River is the only source of permanently flowing water. Moreover, its usefulness is restricted by absence of storage sites, narrowness of the flood plain, low quality of many of its soils (gypsic/saline), marked seasonal flow and over exploitation down stream. There are few seasonal streams within the Central Rangelands which flow for more than a few hours following rainfall. The principal source of surface water is from natural or man-made depressions which collect surface run-off

water. Because of their small size, the low rainfall and high evaporation, these storages provide only limited quantities of water. The sandy nature of most soils and the high cost of constructing man-made structures are also limiting factors.

3.08 The Central Rangelands are relatively well off in terms of ground water supplies. Few locations are more than 20 km from permanent waters, which are mainly shallow wells and boreholes. These occur along the coast; in evaporative formations, deeper limestone aquifers; the Shebelle River aquifer; and on shallow depressions. Water source densities are greatest on the coastal plain, the Shebelle River flood plain and some of the large drainage areas in the interior.

3.09 The rangeland vegetation varies from dense woodland in the higher rainfall areas of the south-west to low herb/grassland in the lower rainfall areas of the north and north-east. It is primarily woody, deciduous, often thorny and, in those few areas where it has been intensively studied, is characterised by: (a) many species, (b) few strong dominants, and (c) a significant amount (up to 25% of total cover) of plants of low palatability. Where farming is possible, even in the most marginal areas, the species composition and structure of rangeland vegetation is strongly influenced by vegetative regrowth in various stages of secondary succession. In these areas, farming and clearing have as much or more influence on the type, quantity and abundance of rangeland vegetation as does use by livestock. Fire is not a major environmental factor.

3.10 Overall, rangeland condition is generally fair. Range conditions are strongly related to distance from water so that highly degraded areas occur near villages/boreholes and range condition improves outward to lightly used areas further away from water. A downward trend in range condition has been demonstrated in Bula Burti district, Hiran region and has been implied elsewhere in the Central Rangelands from other factors such as increased rates of settlement and construction of water points. Simple protection/control of grazing by livestock and use of conservative farming practices have proven adequate to return most degraded sandy soil sites to an upward trend in range condition.

3.11 Wildlife are common but not abundant. The larger species, including ungulates, as well as Ostrich, Baboon and Warthog, comprise only 1.3% of

the total wildlife/livestock biomass. Poaching occurs but there is little information about it. The principal predators are Hyena and Jackals. These are being reduced in the coastal plain and some agro-pastoral areas by privately supported bounties. These have been sufficiently successful to warrant the development of localised free ranging of livestock.

D. INFRASTRUCTURE

3.12 Overall, the utilisation of the resources of the project area is constrained by the very low level of infrastructure. One surfaced highway follows the Shebelle Valley northward to Belet Weyne before turning north-east to pass through the regional headquarters of Dusa Mareb and Galkayo on its way to northern Somalia. This road provides good access to a strip along the south-western and western portions of the project area. Elsewhere, rough tracks or geological exploration lines service perhaps 50% of the project area. They receive no maintenance. Soil conditions would allow many hundreds of kilometres to be greatly improved by regular (twice yearly) passages of a skillfully operated road grader. There is a small port with few facilities at Hobbio.

3.13 With the exception of towns along the main road which have telegraph and telephone lines to Mogadishu, communications are not good and rely on police radio communications at regional headquarters. There are no scheduled flights to the one surfaced and eight un-surfaced airstrips in the project area.

3.14 In phase I, CRDP built modern compounds for NRA staff at 10 of the 13 districts. These included offices, some living quarters, a generator and water supply, and some have two-way radios. Overall, the lack of facilities and the problems of access and communication are very real constraints both to the performance of project staff and to the development of economic activity. However, basic project-related infrastructure is now in place and can be utilised in a second phase.

E. LIVESTOCK

3.15 The Central Rangelands supports about 10,890,000 head of livestock of which goats are the most numerous (7,187,000), followed by sheep (2,409,000), camels (882,000) and cattle (417,000). Total livestock biomass ranges from 1,000-8,000 kg/km^2 increasing from drier to wetter areas. Cattle and camel

biomasses are greatest in the Hiran region, cattle particularly so in the Shebelle Valley. Sheep biomass is greatest in Mudug region. Goats are most abundant in Gulguduud region. Overall, the Central Rangelands supports about 11% of the national cattle herd, 23% of the sheep, 42% of the goats, 22% of the camels and 18% of the total livestock biomass in the country. On the basis of the overall distribution of livestock, the project area contributes some 25% of the total livestock exports, expressed as tropical livestock units (refer Table 4).

3.16 Only limited data are available for herds and flocks in the project area. Tables 1 and 2 below show some of the more important characteristics.

TABLE 1 : FLOCK/HERD COMPOSITION IN PROJECT AREA (%)

		Sheep	Goats
Female:	0-1 yr	26	24
	1-2 yr	10	9
	2-3 yr	16	17
	3-4 yr	18	17
	4 yr plus	8	19
	All females	78	86
Male:	0-1 yr	15	7
	1-2 yr	4	3
	2-3 yr	2	2
	3-4 yr	1	1
	4 yr plus	0	1
	All males	22	14
Total Flock		100	100

Source: CRDP and GTZ (Preliminary).

TABLE 2 : FLOCK STATISTICS FOR SHEEP AND GOATS

Average flock size	192
Crude death rate	26.1% per year
Young death rate	23.7% per year
Adult female fertility rate	79.4%
Average lambing/kidding interval	10.5 months

Source: GTZ (preliminary).

Overall, these parameters are well within the range of rates reported for other pastoral systems. The present disease status of sheep and goats in the project area is satisfactory (GTZ 1986). The ban on the export of female animals may be a constraint to herd development.

F. LAND RIGHTS, LAND USE AND PRODUCTION

3.17 Traditionally, although all rangeland was commonly owned public land, it was accepted that rangeland, once enclosed, belonged to the person(s) building the fence. Current laws vest authority in the Ministry of Agriculture to issue 50 year leases for up to 60 ha of rainfed land, subject to certain conditions. Within the project area the position is complex. Since the area is classified as rangeland, the Ministry of Agriculture has no local representative to issue leases, and consequently leases are issued by local Government. However, as there are many thousands of enclosures in each district, local Government does not have the resources to map and register the enclosures nor to ensure compliance with the regulations. Less than 10% of the enclosed land is registered. Over the last few years there has been a trend towards fencing livestock enclosures in non-agro-pastoral areas to secure de facto ownership of the best grazing land. There is no provision for this in Somali law and a controversial issue has emerged. Agro-pastoralists have also increased the size of their enclosures to secure additional grazing. As communal grazing land is converted to private mixed farms, the pressure on the remaining common grazing areas is increasing.

3.18 Experience from CRDP-I indicates that there are seven production systems within the Central Rangelands. Each is characterised by a different combination of dominant economic livelihood and environmental conditions which result in different productive potentials, and existing and potential management problems. Therefore, each system requires a different approach to development.

The systems are:-

(a) Coastal Plain (CP),
(b) Agro-pastoral Sands (APS),
(c) Agro-pastoral Clays (APC) - Shebelle Valley,
(d) Western Shebelle (WS),
(e) Interior Shebelle (IS),

(f) Interior Dwarf Shrubland/Grassland (IDS/G), and

(g) Northern Plateau (NP).

Detailed models of these systems are considered in Annex 8. The main characters of the systems are shown in Table 3.

TABLE 3 : CHARACTERISTICS OF CENTRAL RANGELANDS PRODUCTION SYSTEMS

Characteristics	Production System[a/]						
	CP	APS	APC	WS	IS	IDS/G	NP
Forage production	high[b/]	high	high	high	mid	low[c/]	low
Livestock biomass (ws)	low[d/]	mod	mod	high[e/]	low	high	v.high
Dry season biomass as % of wet season	56%[f/]	73%	138%	61%	71%	13%[g/]	3%
Unused Forage (ws)	high	high	high	mid	high	v.low	deficit
Maximum seasonal human population	high	mod	v.high[h/]	high	mod	low[i/]	low
Dry season population as % of wet season	9%	109%	38%	30%	67%	43%	-100%

Source: D. Herlocker, CRDP, refer Tables A8.1 and A8.4.

a/ refer paragraph 3.18 for production system codes.
b/ 72 t/km^2.
c/ 35 t/km^2.
d/ 2.1 t/km^2.
e/ 6.2 t/km^2.
f/ 640 kg/ha.
g/ 56 kg/ha.
h/ 16.0 people/km^2 (wet season).
i/ 2.8 people/km^2 (wet season).

3.19 Nomadic Pastoralism is the main activity in the project area. Whilst most pastoral families have a mix of livestock types (camels, cattle, sheep and goats) the mix varies markedly from location to location. Sheep predominate on the coastal plain grassland. Despite the erratic rainfall, seasonal livestock movements are not extensive. Livestock are grazed as much as possible within traditional use areas known as "degaans". These primarily reflect (a) a source of permanent water upon which dry season grazing is based, and (b) kinship ties. Somali pastoralists usually remain within their degaans as long as possible. Thus, in wetter areas, degaans often include both wet and dry season grazing areas and livestock movements generally follow fairly distinct seasonal patterns which are adhered to unless drought (or breakdown of a borehole) force movement elsewhere.

However, in drier areas, where rainfall is more variable, livestock movements across degaan boundaries, particularly in the wet season, are more frequent. In the existing pastoral system, rangelands are rested only when they are far from water or when outbreaks of biting flies in areas of dense bush, or Governmental decrees, drive livestock out.

3.20 Several important trends with implications for range management are apparent within the pastoral systems of the Central Rangelands. Commercialisation of the subsistence system is well advanced. Many producers also grow crops (refer paragraph 3.22) integrated with stock raising. There appears to be a related increase in private enclosure (refer paragraph 3.17). There is more free ranging of livestock in some areas because of removal of predators (refer paragraph 3.11). Finally, recruitment of young pastoralists into the traditional system seems to be declining.

3.21 Livestock are the major export from the Central Rangelands. Available data relating to livestock exports do not allow a direct breakdown into areas of origin. On the basis of the overall distribution of livestock, the contribution of the project area to national exports is shown in Table 4, for the years 1980-1984.

TABLE 4 : ESTIMATED LIVESTOCK EXPORTS FROM THE PROJECT AREA, AVERAGE FOR 1980-1984 ('000 Head)

	Sheep[a/]	Goats	Cattle	Camels	TLU
Total no. exported	3,106	3,381	410	63	1,052
Export from project area	714	1,420	45	14	266
% from project area	23	42	11	22	25

Source: Derived by project preparation team.

a/ Camels 1.2; Sheep and Goats 0.1; Cattle 0.8. TLU = Tropical Livestock Unit.

3.22 Agro-pastoralism: The RMR (1979) surveys identified about 370,000 ha of cropped and recently cropped land in the project area. This system has been in existence for 200-400 years. There is a wide range of practices, varying from true shifting cultivation which is only practised far from water sources, to the more common agro-pastoral complex (APC). Typically, the agro-pastoral complex comprises a number of enclosures owned by the same person. At least part of one enclosure (0.7-3 ha) is cultivated, until the enclosure is exhausted (4-10

years) when another enclosure within the external fence is cleared and cultivated, and so on until all the land has been cropped. The process can then be repeated or the whole area abandoned. Cowpeas and sorghum are the major crops grown, and sour watermelons, sesame and maize are grown in small quantities. Estimated yields are cowpeas 500-600 kg/ha and 300-400 kg/ha in the Gu and Deyr seasons respectively. Sorghum yields about 400-450 kg/ha. No purchased inputs are used with the exception of hand tools.

3.23 Uncontrolled agro-pastoralism may have a deleterious effect on range condition. Agro-pastoralism affects range condition by influencing the abundance of low quality forage plant species which occur in the early stages of succession following farm abandonment. These species often remain in the subsequent regrowth vegetation for many years. Cultivation, low rainfall, loss of plant cover and high wind speeds combine to cause erosion and, in some circumstances, desertification. CRDP reports that large, completely cleared fields can lose their topsoil in two years. A small proportion of agro-pastoralists have developed strategies to minimise cropping damage and CRDP demonstrations of strip cropping and pasture establishment provide a promising indication of ways to reduce erosion. With the high growth of the human population, the spontaneous trend towards agro-pastoralism is likely to increase rapidly.

3.24 Agro-pastoralists are both cultivators and livestock keepers. Cultivation reduces the productivity of the range but provides valuable crop by-products for livestock. Investigations by GTZ indicate that livestock in the agro-pastoral areas are better fed than those on the rangelands. CRDP estimate that crops in the agro-pastoral areas provide approximately 30% of the food requirement of the project area's population. However, the proportion of the land area affected by agro-pastoral activities is not known.

3.25 Other Economic Activities include small levels of meerschaum production from Ceel Buur. Charcoal marketing and wood getting are practised throughout the project area and are accelerating the degradation of the range. Honey is produced in the Shebelle Valley. Small-scale fishing is carried out along the coast.

G. INSTITUTIONS AND ORGANISATIONS

Government

3.26 Administratively, the project area comprises the regions of Hiran, Gulguduud and Mudug, with headquarters at Belet Weyne, Dusa Mareb and Galkayo

respectively. Within the three regions there are 13 administrative districts. The regions are administered by appointed Governors and the districts by a dual appointment of a District Commissioner and a Party Secretary. These officials head district committees comprising locally appointed and elected members. At the village level, there are village committees consisting of appointed and elected members who have responsibility for and influence over an area up to 5 km from the village.

National Range Agency (NRA)

3.27 NRA is a division of the Ministry of Livestock, Forestry and Range (MLFR) and is the agency responsible for the implementation of CRDP. From its headquarters in Mogadishu, NRA maintains three regional headquarters within the project area, headed by a Regional Director. Within each district there is a District Range Officer (DRO) reporting directly to the Regional Director. NRA has national responsibilities, but these are substantially curtailed outside CRDP because of a shortage of finance for operating and investment purposes.

Range and Livestock Associations (RLAs)

3.28 During phase I, CRDP increasingly directed its development efforts through Range and Livestock Associations (RLAs). RLAs are based on traditional grazing areas (degaans) for local pastoralists, which are usually based on permanent dry season watering points and kinship ties. Although degaan boundaries are generally well known and agreed on, there is no land ownership implied and there is free movement across degaan boundaries. Nevertheless, degaan members remain within their degaan if possible and the concept of the degaan as a separate organisational unit seems to be strengthening as rural urbanisation and water bore development increases (refer Annex 5). There are from 6-13 degaans/district ranging from 1,000-3,000 km^2 in area. RLAs have elected committees which deal with the project and assist with development efforts. It is anticipated that RLAs will increasingly take over responsibility for local development efforts.

Other Organisations

3.29 The Water Development Authority (WDA) is responsible within the project area for the operation and maintenance of pumped water supplies. A lack of adequate mobility and a shortage of funds inevitably limit their effectiveness.

Outside the official administrative sphere there are several Muslim organisations with varying capacity and potential for resource development. None currently have the capability to develop or manage resources over a large area.

H. CRDP-I

3.30 Phase I was appraised in 1979 and became effective in 1980. The project was estimated to cost US$46.3 million over 6 years, and was intended to consolidate and improve rangeland and livestock production in Somalia's Central Rangelands and, through the introduction of a system of range utilisation, make way for the gradual concentration of pastoral communities conducive to the provision of social services. Financing initially involved IDA, IFAD, USAID, ODA, WFP and the Government of Somalia. The ODA component was subsequently funded by GTZ.

3.31 It became clear early in the life of the project that the design of the project was inappropriate. Some of the proposals were inapplicable or unacceptable to the pastoralists, and other aspects, for example agro-pastoralism, which is important in the project area, were not considered. Thus, a continuous series of modifications and improvements have been made. These are outlined briefly below and described in chronological detail in supervision mission reports and project documents.

3.32 The objectives of the project were to be achieved through a number of activities. A range development programme was to begin with an aerial resource inventory, establish range condition guides, identify areas of high erodibility and areas suitable for grazing reserves. There were to be specific numbers, areas and types of reserves; famine reserves, range reserves and town/village reserves. Access roads were to be located. A range monitoring unit was to be established which would, by repeated observations, establish a record of condition as a basis for range management. Stock water supplies were to be developed by constructing 32 boreholes. Work was to be carried out throughout the three administrative regions comprising the Central Rangelands.

3.33 A non-formal training component was to survey the pastoral communities and carry out an extension programme which would inform the pastoralists about the objectives of the project. This component would be responsible for the formation of grazing associations for the reserves recommended by the ground

survey component. Simple educational materials would be produced and field staff would be trained and upgraded.

3.34 In order to alleviate an acute shortage of NRA staff trained in range management, a formal training component was to be formed which would include both technical (4 lecturers) and university (1 lecturer) level inputs. This included the Livestock and Range School and the Faculty of Agriculture, Somali National University, both at Afgoi. A department which would provide a B.Sc. programme in range management was to be established within the Faculty of Agriculture. Twenty man-years of post-graduate scholarships and on-the-job training for range monitoring counterpart officers were to be provided overseas.

3.35 A rangeland studies and trials component was to include range grazing trials, range improvement experiments and the development of a forage analysis laboratory for determining forage quality. A taxonomist was to be provided to run the National Herbarium. Soil and water conservation measures were to be demonstrated and grazing co-operatives were to be evaluated (those already existing in northern Somalia), and tested. The NRA Forestry Department was to be strengthened and three town shelterbelts and nurseries were to be built. A veterinary services component was to organise a central diagnostic unit, prepare guidelines for collecting and despatching diagnostic samples, conduct a national disease survey, monitor vaccination campaigns, train counterparts and support a Technical Director of Veterinary Services. NRA was to be strengthened by providing senior technical management personnel, building a range of monitoring services and a stock water service and by constructing a central and three regional workshops. Staff housing, offices and equipment were to be provided.

Inception Plan

3.36 Subsequently, the approach, although not the objectives, of the range development programme was modified in the inception plan which aimed to meet the general objectives by increasing forage availability through:-

(a) Control of livestock grazing,
(b) Location of new water points, and
(c) A limited amount of soil and water conservation.

There was an implicit assumption in the inception plan that range management and improvement would lead to greater livestock production, provided that other

factors (such as disease and animal husbandry) were not limiting factors in the production system and that pastoralists would take advantage of the changes by marketing more livestock and by accepting social services in community centres. There were reservations about limiting the mobility of pastoralists, but otherwise the objectives of the project were given full support.

3.37 The inception plan combined the range ground survey and monitoring unit activities under the responsibility of a single Range Ecologist in each region, and transferred emphasis from a region-wide application of duties to a more methodical step-by-step process based on finishing one district before beginning another. The concept of range reserves was changed from being narrowly specific in terms of number, area and type, to a more flexible interpretation which allowed the nature of reserves to reflect existing ecological and sociological realities. Again, instead of a scatter of reserves over 30% of the Central Rangelands, each district was to be fully covered by reserves, each of which would have a range management plan, however simple, and a local grazing association organised for its implementation. Responsibility for range grazing trials, range improvements, experiments, forage analysis and research was transferred to the formal education component. Evaluation of grazing co-operatives was downgraded.

Other Project Modifications and the 1984 Mid-Term Review

3.38 A Mid-Term Review, attended by representatives from IDA, IFAD, USAID, GTZ, WFP and GOS was conducted in March, 1984. This activity represented the turning point for the project; substantial modifications were agreed on and subsequent progress has been more satisfactory than that achieved during the early years of the project (refer Section J). The main conclusions from the Mid-Term Review and those which had a substantial effect on project execution were to:-

(a) concentrate on three priority districts,
(b) set up CRDP as a separate entity, with a separate Project Manager within NRA,
(c) appoint a Field Manager, and
(d) establish a bi-annual Steering Committee Meeting with attendance by donors and GOS.

3.39 Following the Mid-Term Review, all project activities were concentrated within three priority districts, Bula Burti, El Dere and Hobbio. The position

of Stock Water Service Manager was eliminated and the duties of this position transferred to the soil and water component. Because wind was found to be the major erosive factor throughout most of the Central Rangelands, the soil and water conservation component increased emphasis on sand dune stabilisation and development of village shelterbelts. Temporary surface water supplies were included as a new initiative. Similarly, in response to the needs expressed by the local pastoral communities and the results of investigations, the soil and water component was expanded to include shallow, hand dug wells.

3.40 The formal training component underwent considerable changes in concept and structure. After a number of abortive attempts it was finally agreed to supply 5 professors, build new facilities for the range management training programme, move full responsibility for the programme from NRA to the Faculty of Agriculture, provide an additional thirty man-years of post-graduate training, continue a minimal level of instructional input in range management training at the Secondary Agricultural School until department graduates could take over, continue the ten course curriculum, develop a forage analysis laboratory, and develop a national research programme.

3.41 The GTZ veterinary team did not become involved with the monitoring of national vaccination campaigns, but placed increased emphasis on developing a disease survey and monitoring programme for the project area. The range monitoring service, three regional workshops and audiovisual centres were deleted from the objectives.

3.42 The most recent modifications to CRDP's programme has been the addition of a Livestock Specialist to survey traditional management methods and, where necessary, develop management procedures to improve animal production skills, thereby increasing off-take. The Specialist will also train Somali staff to conduct an initial survey of livestock management practices, then monitor specific herds over a period of time and, finally, introduce management changes to improve herd production.

I. PROGRESS SINCE 1979

Range Development

3.43 The resource inventory of the Central Rangelands has been completed. Range analysis surveys have been completed for Hobbio, Ceel Dheer and eastern Bula Burti district. These include:-

(a) range site mapping,
(b) documentation of vegetation composition and structure,
(c) range condition classification, and
(d) forage productivity for the Hobbio district.

Forage productivity surveys have also been started in Ceel Dheer and Bula Burti districts. A final report has been completed for one district and an interim report for another one and a half districts.

3.44 A floristic key has been prepared for the identification of grasses and a vegetative key is almost completed for identification of all other plant species within the Central Rangelands. A comprehensive flora of Somalia, a briefer overview of the flora with a checklist of plant species and lists of plant species with botanical and Somali names and palatability ratings have been developed and tested.

3.45 Range management plans have been prepared and are under implementation on about 10% of the area of the priority districts. Plans are under discussion by the local Range and Livestock Associations on another 20% of the priority district areas (two districts). The beginnings of a meteorological recording system has been established. Fifteen counterpart officers have been trained.

Water Development (Boreholes)

3.46 Twenty boreholes have been drilled, 7 successfully. Five have been equipped with diesel pumps and three with hand pumps. Ten boreholes were dry and a further 2 produced water too saline for use even by camels. However, the dry and saline holes have provided useful data on the distribution of sub-surface water sources within the priority districts where the bores were drilled.

Soil and Water Conservation

3.47 Dugouts (excavated earth tanks) for seasonal stock water supplies have been excavated at 17 sites and 11 existing shallow wells have been improved (cement lips and aprons and stock water troughs). Nine village shelterbelts have been planted by soil and water conservation staff and plans prepared for a further 6. Cement lined berkeds have been constructed to supply water for 8 of the shelterbelts. Four tree nurseries have been built. To-date these have

produced 38,000 tree seedlings for shelterbelts, experimental trials and local village plantings. Sand dunes have been stabilised at 3 sites and plans drawn up for stabilising a further 12. Technical job sheets, guides and information sheets have been developed for field use by soil and water conservation staff. Thirty-one persons have received on-the-job training in soil and water conservation duties. These include 7 counterparts, 11 technicians, 6 heavy equipment operators and 7 well rehabilitation staff.

Non-Formal Education

3.48 An effective non-formal education component, consisting of 18 professional and field Extensionists and 3 Audio-Visual Technicians, has been developed. Four staff have received post-graduate training through the project. Non-formal education staff have carried out the following surveys within the priority districts:-

(a) livestock seasonal herding patterns and herd movement rationale,
(b) traditional grazing area boundaries,
(c) local priorities for type and location of water development,
(d) livestock numbers, livestock owners and pastoral leaders,
(e) basic household consumption, and
(f) a more localised special survey of agro-pastoralism.

3.49 A procedure for forming RLAs has been developed. RLAs are representative pastoral development organisations for traditional grazing areas. Potential RLAs have been identified throughout the entire areas of the 3 priority districts. Six RLAs - 2 in each district - have been organised and are now operational. Two of these now have 3 years experience and another 2 have 1 years experience in carrying out a simple system of rest rotational grazing within their traditional use area. The non-formal education component has been instrumental in bringing about CRDP programme modifications viz. shallow well improvements, construction of temporary surface water supplies (dugouts), primary veterinary health care for the RLAs and agro-pastoral extension. Two agro-pastoral demonstration trials have been established in Ceel Dheer district. Water was found to be a very sensitive issue for the pastoralists. Consequently, to facilitate implementation, an intensive survey and consultation procedure was developed and successfully instituted to precede and accompany all forms of water development.

Formal Education

3.50 A Department of Botany and Range Management has been formed within the Faculty of Agriculture of the Somali National University at Afgoi. Four of the planned 5 professors have arrived and curricula have been developed for a 10 course programme in the last 2 years of the agricultural degree programme.

The necessary physical plant is either in place or is under construction. Range research studies are underway and some have been completed. Thirteen students have graduated (another 14 will graduate in 1986) and 7 post-graduate students are now in the USA. Overall, the main effort to-date has been in building up the facilities and commencing the teaching programme. Technical training has been de-emphasised. Student and staff research projects have been started on the Artificial Insemination Centre's Farm at Afgoi and, in co-operation with the Range Ecologist, in the Ceel Dheer district.

Livestock Production

3.51 The animal production team has collected information for, and reported on, livestock management practices and production systems in Bula Burti district. Similar work is now being carried out in Ceel Dheer district.

Veterinary Component

3.52 Construction of physical facilities by GTZ, including a Central Veterinary Investigation Laboratory (Belet Weyne), 2 field laboratories (Dusa Mareb and Galkayo), staff housing and logistical support units, has been completed. National veterinary staff have been recruited and trained. A survey of livestock diseases has almost been completed and a method of disease monitoring is being developed. Considerable valuable information has been collected on livestock production factors, herd dynamics and management.

Forestry Component

3.53 The GTZ forestry component has established tree nurseries (60,000-150,000 seedlings per year), woodlots and plantations (30-50 ha each) at each of the 3 regional headquarters; Belet Weyne, Dusa Mareb and Galkayo. Staff housing and offices have been constructed and training programmes conducted for NRA staff.

Infrastructure Development

3.54 Construction of national, regional and district headquarter facilities for NRA has been completed. This includes the large NRA office buildings and vehicle maintenance workshop in Mogadishu, 3 regional and 7 district headquarters (including offices, generators, and living quarters). These buildings are of a high standard, and are a considerable asset for development work. Only 3 districts remain without any facilities, Jalalaksi, Abud Wak and Biera.

J. RESULTS FROM PHASE I

3.55 Four main conceptual lessons have been learnt from experience during phase I. These are:-

(a) implementation must be preceded by thorough investigation, and study of resources and the people whose livelihood depends on resource conservation and utilisation,
(v) CRDP must operate as a separate entity within NRA if it is to be effective,
(c) regular and adequate supplies of vehicles, fuel and spare parts are essential for effective project management, and
(d) RLAs have a key role in the development process.

3.56 Results from phase I can be categorised as direct and indirect, with respect to their impact on the pastoralists and villagers in the project area. Because phase I was the first activity of its kind in the project area and limited baseline data were available before the project started, the quantification of the benefits is not possible. The position will be improved in a phase II because of the base data collected in the first phase.

3.57 Direct benefits to project participants in phase I have included boreholes (7), dugouts (17), livestock river access points (7), well rehabilitation and improvements (11), co-operative CRDP/local community digging of shallow wells, controlled grazing and reserves (5), shelterbelts (9), tree nurseries (6), charcoal plantation (1), agro-pastoral demonstration trials (2) and a livestock health programme.

3.58 Indirect benefits have included the development of a Department of Botany and Rangement Management within the Faculty of Agriculture at the Somali

National University. This has already resulted in an improvement in the educational quality and commitment of graduates joining CRDP. Also, a number of Somali counterparts are being trained, primarily at the post-graduate level, in the USA and Australia. Some have already returned to take up highly responsible positions within CRDP. Good examples are the original and present Project Managers of CRDP. On-the-job training has been given to a large number of counterpart staff, most of whom have now accepted positions of responsibility within the project. Some have subsequently trained further Somali staff at the technician level.

3.59 Considerable knowledge about rangeland ecology and livestock health has been obtained which provides a better understanding of the problems and problem solution. It has also allowed the development of more efficient techniques for field surveys. Considerable knowledge has also been gained about how best to interact with local people so that project developmental activities are relevant and are easily carried out. This especially relates to the need for pastoralists to slowly take over increasing responsibility for maintenance of management interventions. A few range and livestock associations now have functioning controlled grazing systems.

IV. THE PROJECT

A. RATIONALE AND OBJECTIVES

Rationale

4.01 Consideration of the results from CRDP-I and other available data indicates that current production from the rangeland is close to the sustainable maximum and has been finely adjusted by the pastoralists to meet the harsh and uncertain environment in which they exist. Particular aspects of relevance to the design of CRDP-II are discussed below:-

(a) Total forage production is currently in reasonable balance with total livestock and feed requirements in "average" years.

(b) Rangeland condition is generally fair, however, a downward trend in condition has been demonstrated in some specific high use areas. Small increases in productivity would be obtainable through rest/rotational management of grasslands, strategic location of temporary water sources and improvement of animal health.

(c) Livestock products (meat and milk) from the current herd cannot support the existing population through direct consumption, but have to be exchanged for higher energy content foods (sugar, cereals) in order to enable the current population to survive.

(d) Relative livestock/cereal prices have a direct effect on the ability to cover family energy consumption and nutritional requirements. Increases in cereal prices relative to livestock prices will force an increase in cultivation.

(e) The potential for changing production relationships and increasing sustainable output per family or per land unit is limited but does vary considerably across the 7 production systems. It is largest in the agro-pastoral systems.

(f) Cultivation in those areas where rainfall and soils permit is increasing beyond prior levels. Due to the fragility and low fertility of the soils and constant high winds, inappropriate cultivation techniques can make the land unproductive and unstable for long periods.

(g) Production increases to be obtained from increasing permanent water points and increased access to hitherto under-utilised productive range (small areas) are available, but will also be small.

(h) As a consequence of the low rate of growth and regeneration of permanent vegetation in the rangelands (due to low and erratic rainfall, infertile sandy soils and constant winds), the vegetation production systems are fragile. Recovery of both animals and vegetation from perturbation is slow.

(i) Herd and flock structures are set to maximise milk production and capacity for regeneration after drought. Male sheep and goats are sold as soon as possible. No significant increase in off-take rates seems likely.

(j) Despite the constraints outlined above which are generally applicable to all rangeland in Somalia, the nation's rangelands provide both the majority of Somalia's exports, and employment for the majority of its population. The project area comprises a major portion of the nation's rangeland.

(k) CRDP-I has established a capable team endowed with trained personnel, a physical base in 10 districts, and a range of vehicles and equipment. Excellent relationships have been established with pastoralists, and considerable base data collected. CRDP is thus well placed to take advantage of the opportunities for a second phase. Equally, in the absence of a second phase, the team will disintegrate and the initial steps taken towards the management of Somalia's most important resource will be severely curtailed.

(l) Against the background outlined above, CRDP-I has identified a number of opportunities for increasing productivity, reducing resource degradation, or both. These opportunities include increased animal productivity from strategic anthelmintic dosing, improved agro-pastoral productivity from new varieties of cowpeas and mungbeans, increased forage production from more productive grass species which also reduce the risk of erosion, and strip cropping techniques which reduce the risk of erosion. Strip cropping techniques reduce the need to shift cropped areas, and live fencing helps to protect cropped and other special use areas without reducing the tree cover which occurs where thorn fencing is used. Ecological studies have identified areas where forage is not presently fully utilised, mainly due to a shortage of water.

Objectives

4.02 The general objectives are to maintain and improve the conservation of natural resources, limit the rate of environmental degradation, improve

sustainable productivity and improve the welfare, living standards, and food and financial security of the local people. The specific objectives maintain a balance between the immediate application in the field of techniques which are proven or which have a good chance of being successful, and the need to obtain further information on potentially valuable interventions which may be applied in the future. The four main objectives which fall under the general headings of investigation, implementation, monitoring and institutional development are to:-

(a) Complete the investigations of the principle production systems in the Central Rangelands with special emphasis on determining the constraints to productivity and environmental stability.
(b) Continue with implementation of managerial interventions introduced or identified during CRDP-I, through continued investigation and with increased emphasis on demonstrations and extension.
(c) Monitor the success of management interventions and long-term trends in the Central Rangelands with significance for conservation and productivity.
(d) Continue the institutional support for NRA/CRDP through programmes of education and training and the provision of essential equipment supplies and allowances.

Project Approach

4.03 Broadly, the project approach would be on two fronts; development of proven interventions would proceed in the priority districts studied during phase I whilst at the same time, the remaining districts would be studied to determine which of the development options are applicable. This approach is based on the rationale that the project has already achieved some successes with development in a very difficult environment, a lot is known about some of the micro-environments, and therefore investigation and implementation should proceed in unison.

4.04 Programme modifications during the early stages of CRDP-I clearly indicated the need for a systematic approach to the introduction of project activities. Prior to introducing management interventions, it is important to have a knowledge of the major factors influencing and comprising the production system, together with a knowledge of the present status of the system in relation to productivity and conservation. This would permit a determination of both the potential status under optimal management and the potential dangers for

sub-optimal management, and provide an integrated basis for long-term monitoring.

4.05 The first step in the developmental process would therefore involve a series of Systems Investigation and Monitoring Programmes (SIMP) (refer Annex 1). Detailed phasing of the studies, introduction of interventions and monitoring is provided in Annex 1 and summarised in Table 5. The individual activities are shown to demonstrate the sequential nature of the proposed approach. SIMP is a systems oriented programme designed to optimise data collection and analysis and subsequent use of survey and study findings to determine practical management interventions. Systematic Regional Reconnaissance Flights (SRRF) would be made over the entire project area to provide information on numbers and areas of livestock and crops, and distribution patterns and long-term trends. Systematic Reconnaissance Flights (SRF) would be made seasonally over small areas to determine seasonal variations in production system attributes.

TABLE 5 : INDICATIVE SCHEMATIC PHASING OF PROJECT ACTIVITIES

	Project Year 1	2	3	4	5	6
1. SIMP PRODUCTION SYSTEM:						
Coastal Plain	ooooooo					
Agro-pastoral Sands	ooooooo					
Agro-pastoral Clays		ooooooo				
Western Shebelle		ooooooo				
Interior Shrubland			ooooooo			
Interior Dwarf Shrub/Grassland			ooooooo			
Northern Plateau				ooooooo		
2. PRE-DEVELOPMENT SURVEYS AND COMMENCEMENT OF INITIAL DEVELOPMENT (——), MAIN INTERVENTIONS (----) AND OTHER ACTIVITIES (xxxx):						
Bula Burti a/	=======	xxxxxxx				
El Dere a/	=======	xxxxxxx				
Hobbio a/	=======	xxxxxxx				
Haradhere		———	xxxxxxx			
Jalalaksi		———	xxxxxxx			
Belet Weyne			———	xxxxxxx		
El Bur			———	xxxxxxx		
Galkayo				———	xxxxxxx	
Dusa Mareb				———	xxxxxxx	
Addado					———	xxxxxxx
Jariban					———	xxxxxxx
Gulguduud c/						———
Abud Wak c/						———
3. MONITORING:						
SRRF (all districts)	———		———		———	
SRF	b/	b/	b/	b/	b/	b/

Source: CRDP.

a/ Bula Burti, El Dere and Hobbio were priority districts in phase I. SIMP and the pre-development surveys in phase II would complement the activities completed in phase I and concentrate on the agro-pastoral systems, and livestock production and socio-economic aspects which were not considered or covered inadequately in phase I.

b/ Conduct seasonally over a sample of all production systems and a range of districts.

c/ Main interventions and other activities would continue into year 7.

Code: ooooooo SIMP surveys.
——— Pre-development surveys and initial development.
---------- Main interventions.
xxxxxxx Other activities.

B. PROJECT DESCRIPTION

General

4.06 The proposed 6 year project would continue the basic resource inventory initiated in phase I through a systematic sequential programme which would progressively examine, record and analyse the condition and quality of the pastoral and agro-pastoral resources in each production system and district. Following the initial inventory, the project would introduce applicable interventions which would have been tested in the project area, or more rarely elsewhere in Somalia or abroad. The studies and interventions would be the responsibility of teams of expatriate and Somali specialists, equipped with vehicles, access to light aircraft and accommodation in appropriate field quarters. All data would be collected, stored, analysed and monitored on an integrated system basis.

4.07 Interventions would be simple and readily applicable to a large proportion of the project area population. They would not be uniform, but would be adjusted to the particular specific conditions and requirements of each system and district.

4.08 To achieve its objectives, the project would continue to strengthen NRA/CRDP through improved salaries and allowances, increased training programmes at all levels and through the provision of some housing for key staff. The provision of improved transport (vehicles and charter aircraft) and communication facilities (mainly two-way radio) together with some road improvements would provide support to NRA/CRDP in particular, and to the development of the Central Rangelands in general.

4.09 The project's components (refer below) have been described on the basis of function rather than activity. This is because there is over-lap between the areas of responsibility for the senior expatriate and Somalia staff. Further details are given in Section V, Project Implementation.

Project Components

4.10 The project would have four basic components: a Technical Services component which would undertake the investigatory aspects of the project; test and demonstrate the interventions; record and analyse the results from

investigations, trials and demonstrations; and provide technical support for the Field Services component. The Field Services component would undertake the delivery of the technical messages and interventions to the project area population at village and community level, and provide all the logistic and physical support for project staff working in the field. The key Extension and Agro-pastoral Sections would be located in the Field Services Division. Both the Technical and Field Services components would be supported by a Finance and Administrative component which would include the mechanical servicing operations essential to keep project vehicles mobile. The fourth basic component would be Training.

4.11 The broad relationships between the project's objectives (para. 4.02) and the project's components are shown below.

Objective (para. 4.02)	Component
(a) Investigation of production systems	Technical Services.
(b) Implementation of productive interventions	Field Services with back-up and support from Technical Services.
(c) Monitoring of interventions and long-term trends	Technical Services with feedback from Field Services.
(d) Institutional support	Finance and Administrative Services and Training.

4.12 The project would, on a sequential district by district basis, use the systems approach to investigate and record the project area resources, to analyse the results, to prove and popularise interventions and to monitor long-term trends. Many project inputs would be utilised by different sections of the project at varying times for a variety of purposes. For example, aerial photography and satellite imagery would be used for the SIMP studies, by the Development Systems Analyst, by the Remote Sensing and Monitoring Unit and by the Extension Section. However, equipment and consumable supplies which the project would provide are described in relation to their primary use[1/].

1/ A more detailed appreciation can be obtained by reading this section in conjunction with Section V and by reference to the tables in Annex 7. This section concludes by listing project costs by component and by the main investment and recurrent items.

Technical Services

4.13 Technical Services would initially be guided by an expatriate team comprising a Chief Technical Manager, a Systems Data Analyst, a Socio-Economic and Rural Development Officer, a Range Manager, and a Livestock Production Officer. Each of these officers would have no less than two Somali counterparts who would be senior officers. In conjunction with their respective expatriates, the senior Somali officers would set up the SIMP studies. The SIMP programme would use the systems approach to optimise data collection and analysis and subsequent use of survey and study findings to determine practical management interventions. The phasing of SIMP is discussed in paragraph 4.05. Working from two mobile base camps and district facilities when available, the teams of senior Somali officers, accompanied by new graduates, would systematically examine the resources of the agricultural systems and districts and determine appropriate interventions. Technical Services would not be confined to the SIMP studies which would only be the initial thrust. The project would provide equipment and staff to acquire, collate, analyse and monitor relevant aerial photographic and satellite imagery over the period from 1960. Long-term monitoring programmes would be initiated to identify and measure trends in the disposition and composition of the natural resources over time.

4.14 Phase I of CRDP placed very high priority on various forms of pasture reserves. These have been the least popular intervention with the project area population and largely for this reason, pasture reserves are difficult to effectively establish and administer. Never-the-less, pasture reserves are necessary interventions for the rehabilitation of degraded rangelands. Their effectiveness in this regard has been demonstrated in Hobbio district. CRDP-II would continue to support the existing reserves (Hobbio 2, Ceel Dheer 2, Bula Burti 3) and would site others (up to 3) where circumstances require and allow. Small-scale sand dune reclamation, where houses or other infrastructure (for example wells) are threatened, would be continued as in phase I. A total of 14 new sites would be improved. Village shelterbelts (39) and village conservation areas (45) would improve the quality of life in a substantial number of villages and, in the longer-term, would provide fuelwood and building timber. The SIMP studies would confirm these targets.

4.15 The GTZ livestock and animal health programme would continue until year 3 of phase II. Phase II would then provide funds to maintain the ongoing

activities of the health programme and the drug revolving fund. From year 1, project-supported livestock health staff would work in SIMP and elsewhere, and in conjunction with GTZ, carry out investigations and demonstrations in relation to animal health and production. To assist this work, the project would purchase small herds and flocks for disease and productivity monitoring. Work with camels is difficult mainly because of the interference which it causes in the daily activities of the camel herder. The project would purchase a herd of camels for demonstration purposes. Camels would also be purchased in connection with the development of a dugout desiltation programme similar to the one initiated by ILCA, and for the development of a camel-powered water lifting system from deep wells. Somali pastoralists do not normally ride camels, although there does not seem to be any fundamental objection to the idea. The project would investigate the possibility of training camels and riders. If successful, this would reduce project costs as some field staff would then use camels for transport. The possibility of using camels and donkeys for traction would also be examined. A total of 87 camels would be purchased.

4.16 Short-term consultancies would assist the project with the camel riding (3 man-months) and camel scoops and draft animal traction (2 man-months). During phase I, 10 RLAs were formed. These were initially proposed as a means of developing various types of grazing reserves. A 3 man-month consultancy would examine the socio-economic and legal aspects of RLAs and advise the project on the appropriateness of RLAs as developmental organisations for phase II. Milk production is an important aspect of livestock husbandry in the project area. It is possible that at times of peak production there might be better uses for milk, and a 3 man-month consultancy would be provided to study alternative uses. ILCA has developed a wide experience in rapid herd appraisal techniques and has a powerful computer especially programmed for livestock studies. The project would provide for assistance from ILCA (6 man-months) and for computer access (SoSh 850,000). A 3 man-month study would be financed to consider the role of credit in the project area, and the results from the planned USAID credit study.

Field Services

4.17 The Field Services component would provide the interface between the target population and the project. It would be the focus of activity during the project and the main implementing force in NRA in the project area at project completion. At full project development, 39 District Extension Officers (DEOs)

would disperse the technical messages provided by Technical Services and the Extension and Agro-pastoral Sections (within Field Services) through 120 village extension workers (VEWs) who at any time would have primary contact with about 9,600 contact pastoralists and agro-pastoralists. They would be assisted at the district level by 13 District Range Officers, 13 District Arid Land Foresters, 7 Plant Material Technical Officers and 23 Site Technicians. The extension methodology would be a modification of the T & V system, to allow for the fact that the contact pastoralists and agro-pastoralists are not sedentary. The DEOs, and through them the VEWs, would be regularly briefed and constantly supported by the Subject Matter Specialists in the Technical Services Division and the Extension Section, who would provide regular meetings, newsletters, briefing notes, technical reports and answers to specific problems. They would also assist and/or organise field days, seminars, workshops and training sessions at various levels. Field Services would also, through both the existing nurseries and the 8 to be established under the project, provide trees for the project area.

4.18 Within Field Services, an Extension Section would be created to provide technical support to the field level staff. Equipment provided by the project would include a computer, a simple dark room and associated black and white photographic printing equipment, typewriters, photocopier, and audiovisual and reproduction equipment. Provision would be made for workshops (3 per year), training seminars, field days and an annual seminar. The Extension Section would be responsible for the production and regular up-dating of a video of project activities. This would be used for project promotion and to ensure that donors and Government agencies are aware of the project's achievements. Phase I established the principle of CRDP-financed demonstrations as a method of establishing contact with the pastoralist communities and introducing promising interventions. During phase II the same technique would be adopted, at least initially. Interventions, selected as a result of investigations, trials and demonstrations, both inside and outside the project area, would be provided on a partial cost recovery basis (or on occasion free) to project area pastoralists and agro-pastoralists to encourage participation. Household economics would also be considered through the inclusion of a female family Extensionist on the project's staff.

4.19 Agro-pastoralists face problems and opportunities different from those affecting pastoralists and, in recognition of this, the project would establish an Agro-pastoral Section within Field Services. Improved seeds would be

fundamental to many of the planned interventions in the agro-pastoral area and the project would establish, as a priority, a Seed Multiplication and Storage Centre of about 50 ha at Bula Burti. A consultant Agronomist (3 man-months) would assist with site selection. The Centre would comprise two-bedroom houses (2), single quarters (4), seed storage shed, general store, office and ablutions, together with power and water connections. Detailed design of the Seed Multiplication and Storage Centre would be undertaken with assistance from short-term consultants (6 man-months) and the Centre would be provided with cultivation, seeding, fertilising and spraying equipment, an irrigation pump and system, together with seed testing and storage equipment, including a dehumidifier. Soil and plant analysis would be contracted out. Two adaptive trial sites would be developed at Nooleeye and Bula Burti, and an additional two-way radio would provide communications with the existing radio at Bula Burti. The project would contract out much of the seed production to small farmers, mainly for cowpea, mungbean and Cenchuus ciliaris at least in the early years.

4.20 Enclosures in the agro-pastoral and pastoral systems are believed to be important, but their extent is unquantified. The dynamics of the systems are not understood. The project would provide 8 man-months of short-term consultancy to study private enclosures. This team would utilise the remote sensing equipment referred to in paragraph 4.13. The project would, in the PPF period, provide an agro-pastoral study tour for senior CRDP staff. Almost none of the CRDP staff have any first-hand experience of semi-arid zones outside Somalia and the project would arrange for 6 man-months of project staff training. A Somali Seed Production Agronomist and a Seed Technologist would be trained overseas (1 month and 1 year respectively) during the PPF period. The project would continue the support for the herbarium and the documentation centre in line with the programme commenced in phase I.

4.21 The technical interventions to be extended would include technology evaluated in CRDP-I, viz. live hedge fencing, shallow hand dug wells, internal parasite control by drenching sheep and goats, limited sand dune fixation of small dunes threatening high value resources, enclosures and regeneration of degraded areas and use of guttering to collect rainwater. Technology which has been demonstrated successfully and would be extended and refined, would include improved cowpea and mungbean varieties, strip clearing and strip crop and pasture establishment, agro-forestry with multi-purpose trees, and siting, construction and maintenance of dugouts. The trials work which would be

undertaken during CRDP-II would also be expected to produce further interventions. These would possibly include more useful forage and crop varieties, husbandry techniques for increased crop yields, the use of animal traction, wind power, hand pumps and a range of other techniques (refer also Annexes 2 and 3).

4.22 Existing district headquarters would be improved by the addition of stores, meeting shelters, and guttering and tanks for the main roofs, and most importantly by the erection of one single house and 3 married houses in each district. Headquarters would be constructed in those districts not covered by phase I. Improved water supplies, using windmills where appropriate, and solar or wind powered generators for the project-funded two-way radios would improve living conditions and communications. The project would provide each district with a tractor and trailer which would be used for transporting Commiphora for live fencing, project supplies, water in the project-provided water tanks and limited personnel transport.

4.23 The project would construct up to 10 boreholes in selected areas where the local inhabitants requested them, and more importantly, where project investigations indicated that the increased stocking, which would be attracted by the increased water, would not place undue pressure on the rangelands. In conjunction with RLAs and local pastoralists and village communities, the project would select sites and then construct up to 70 dugouts. Both boreholes and dugouts would provide incremental water supplies, mainly for animals. The project would also renovate 28 well heads, assist with the renovation of a further 28, and construct 28 new wells. Well head renovation would comprise the construction of a metre-high masonary wall at the top of the well, surrounded by an outward sloping concrete apron. Windmills (27), similar to those erected at district headquarters, would be placed on appropriate bores or wells, either as demonstrations or following negotiations with the RLA concerned. Borehole maintenance for all CRDP-I and CRDP-II boreholes (up to 17) would be carried out by the project for the whole project period. Routine maintenance would be the responsibility of a maintenance team equipped by the project. Major work would be carried out by private sector contractors or by tender. Heavy earth moving equipment (1 grader and 2 dozers) supplied in phase I would be augmented by an additional grader, a loader and tip truck. This unit would construct dugouts, grade airstrips in appropriate locations (particularly for SIMP), and, in strategic places and where soil conditions are appropriate, form up and regularly grade major sections of road. Some 300-400 km of road would be

improved, at least to some degree, by a twice-yearly passage of graders, operated by Somali drivers who would be assisted to improve their skills through the employment of a skilled grader operator/instructor (2 man-months).

4.24 Vehicles. There have been major advances in diesel engine design and technology since the start of phase I. Diesel engines are now much lighter in weight, run more smoothly and are more efficient. The savings could be in the order of 40% of fuel usage, which, coupled with a lower cost for diesel fuel compared with petrol, results in a substantial saving which outweighs a slightly increased initial cost, compared with petrol engines. All project vehicles purchased in phase II, with the possible exception of the saloon cars and the motorcycles/scooters, would be diesel powered. Early in the project period, trials with motorcycles in the districts would establish if some of the small 4WD vehicles could be substituted by motorcycles. Mobility would be very important for the project and the condition of the remainder of the phase I fleet as at the commencement of phase II will depend upon timing and circumstances in the intervening period. Project vehicle requirements have been calculated on the conservative assumption that no functional 4WD vehicles would remain from phase I. Trucks would, however, still be in reasonable condition. The position relative to the 4WDs should be reviewed at appraisal. In any event, although shown in project year 1, the new vehicles would be purchased on the basis of need. In summary, the project would, over the 6 year period, provide 215 units including 14 tractors. Of these, 64 vehicles and 13 motorcycles would be replacements for phase II purchases (for details refer Tables A7.1 to 7.23).

Financial and Administrative Services

4.25 The project would construct the 10 expatriate houses approved in phase I, but not built. In addition, the project would extend the workshop facilities by constructing a mezzanine floor store, relocating the ablution block and constructing a new reception area for vehicles, complete with vehicle ramps and a cemented work area. Photocopiers would be replaced and augmented (4 in year 1 and 4 in year 4). A computer would be provided for the expatriate Financial Manager who would be responsible to the Somali Project Manager for all accounting and financial control activities. Ten air conditioners would improve working conditions for senior staff. New workshop equipment would increase the efficiency of this unit. The project would provide a 2% allowance for building maintenance, together with general operating expenditure for services,

maintenance of equipment, and furniture, office supplies, report and publication costs and audit fees. Provision would be made for consultants to prepare an project review in year 5 (5 man-months). The possibility of future development for the Hobbio port would be the subject of a short-term consultancy (3 man-months). If the study indicated good prospects for economic development, the project would approach potential donors.

Training

4.26 Training under the project would be a major initiative and activities would cover all project components. SIMP would be the basis for the initial and ongoing training for project staff and this would be supported by large in-service training programmes organised through the Extension Section in the Field Services Division. In addition, the Agro-pastoral Section (also within Field Services) would provide training inputs.

4.27 There are a large number of Somali National University (SNU) graduates available for employment by CRDP. They are graduates in animal husbandry, agriculture, veterinary science and, more recently, range management. The range management course is taught in the Department of Botany and Range Management within the Faculty of Agriculture. The effectiveness of the graduates would be enhanced if the curricula included forestry, wildlife, soil and water conservation, watershed management, range economics and social aspects of range development. Support for this development, outside of CRDP, would benefit all NRA and CRDP staff.

4.28 CRDP-II would co-operate with the SNU by providing selected students and graduates with opportunities for field investigation and applied research. These activities would be funded from the adaptive trials allocation, and through the provision of general transport and use of project equipment. This approach would improve the content of SNU courses, widen the curricula for students and assist CRDP.

4.29 Overall, the training of CRDP staff at all levels would be a very important aspect of CRDP-II. A widely based, applicable, and well executed staff training programme would be established. Much of the programme would not be formalised into courses. For example, Subject Matter Specialists would be solely concerned with the training of District Extension Officers (DEOs), the DEOs with training the Village Extension Workers (VEWs) and the VEWs would

provide training to pastoralists and agro-pastoralists. Similarly, the Senior Somali Officers would receive ongoing training from their counterpart expatriates. Training would be individual, on a daily task-by-task basis. For example, in the SIMP teams and periodically through a series of workshops, seminars and field days. Training would be assisted by the production of project visual aid material and publications. Training would also be given to mechanics in the workshops, to computer operators, drivers and other staff.

4.30 This internal training within CRDP would be essential but would not be sufficient. Some training outside CRDP would be necessary to widen skills and to build a solid cadre of experienced technical, administrative and managerial staff. The project would provide training both within Somalia and elsewhere.

4.31 Training Within Somalia, Outside CRDP. The project would provide for a range of training within Somalia. The programme would comprise:-

(a) Externally assisted courses. Specialists would provide up to 10 courses over the project period. Each course would be about 3 weeks long and would be attended by about 30 selected CRDP staff with similar backgrounds and academic qualifications. Provision would be made for external lecturers for each course, however, wherever applicable, resident project expatriates would take part and thus reduce project expenditure. Resultant savings would be utilised elsewhere in the training programme. Course topics may include extension methodology, project management, sampling/statistics/ computer use, arid and semi-arid agro-forestry, remote sensing and air photo interpretation. Where possible and appropriate, courses would be developed in conjunction with other (local) organisations and projects, and the scale of the courses would be adjusted accordingly.

(b) Somali National University (SNU). Up to 6 scholarships would be provided for CRDP staff to attend full-time courses at SNU. Staff would be carefully selected. Length and quality of service with CRDP would be important criteria.

(c) Afgoi Forestry and Wildlife Training Centre (AFWTC). The AFWTC is upgrading its facilities and courses. The project would, subject to

a review of course content, provide for 6 scholarships for CRDP staff selected on a similar basis as for the SNU.

4.32 Training Outside Somalia.

(a) Short-Term. The project would provide for up to 8 staff to participate in short-term overseas training courses each year. External courses, study tours, seminars and workshops would be included. This training would primarily be in Africa and predominantly in Kenya.

(b) Medium-Term Practical Courses. The project would provide for 6 staff to participate in practical training courses, often on secondment, to suitable institutions probably in Africa, India and Australia. Students would work on a full-time basis. Examples of these courses would include work with ILCA, agro-forestry in arid areas of India, and rangeland renovation in Australia. These courses would expose the trainees to a range of practical technology at the applied level.

(c) Long-Term. Long-term training would be important to CRDP-II and ultimately to NRA. Local institutions have not yet developed specialised courses at post-graduate level. Some higher level specialist training overseas would therefore be essential. All courses would be at English language institutions and preparatory English training in Somalia would be provided to a variety of staff prior to the commencement of training. The appropriate level of training would vary with the needs of the individuals, their initial training and the availability of courses. Selection of persons and courses would be made on a case-by-case basis and the project would provide 14 man-years of post-graduate study.

4.33 In-house workshops, seminars and routine training would have by far the largest impact on CRDP in relation to training. Detailed quantification of numbers would be compiled during preparation of the annual work plans. Additionally, staff would receive special training (refer Table A7.23), which also provides details on an agro-pastoral study tour and agro-pastoral training. Details on other training activities are provided in Table A7.17.

Project Costs

4.34 Project cost estimates are shown in Table 6. These estimates were constructed using late 1986 costs, based on local quotations for locally sourced items and CIF costs for imported items. All cost estimates were then adjusted upwards to reflect the possible position in January, 1988, when the project might commence. Foreign sourced items were increased by 3% (IBRD, OPN, September, 1986) and local costs by 20%. This latter figure reflects the stated policy of CRDP to improve wage rates as well as probable increases in local costs.

4.35 Total adjusted baseline costs are estimated at SoSh 2,405 million (US$28.3 million), with a foreign exchange content of 74% (SoSh 1,782 million, US$20.97 million). Physical contingencies at 7% increase the total cost to SoSh 2,573 million and financial contingencies amount to SoSh 222 million. These were calculated from the financial contingency figures shown in Table 7. The foreign exchange escalation was taken from IBRD, OPN, September, 1986. The local cost escalation was estimated by the consultants as being a balance between the high rates of inflation which have occurred in past years and the modifying effect of the current policy of bringing the official and unofficial exchange rates together. The position at the time of project preparation was volatile and may be clearer at appraisal.

TABLE 7 : FINANCIAL CONTINGENCY RATES (%)

	Project Year					
	1	2	3	4	5	6
Local Costs	-	10	10	10	10	10
Foreign Cost	-	1	1	3.5	3.5	3.5

4.36 Table 8 shows the unadjusted project costs by item.

Project Preparation Facility

4.37 A project preparation facility would be required to bridge the gap between CRDP-I and CRDP-II. This would enable key training to be completed (particularly the study on agro-pastoralism), so that staff and work programmes were prepared for CRDP-II. Training would focus on preparing the initial SIMP teams for their work early in year 1, and staff would be trained for the SRRF

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CENTRAL RANGELANDS DEVELOPMENT PROJECT, PHASE II
TOTAL PROJECT COSTS (SS '000)

TABLE 6

PROCOST	YEAR 1			YEAR 2			YEAR 3			YEAR 4			YEAR 5			YEAR 6			TOTAL			TOTAL US $			% OF TOTAL
ITEM	LOCAL	FE	TOTAL	LOCAL	FE	TOTAL	LOCAL	FE	TOTAL	LOCAL	FE	TOTAL	LOCAL	FE	TOTAL	LOCAL	FE	TOTAL	LOCAL	FE	TOTAL	LOCAL	FE	TOTAL	PROJECT
TECHNICAL SERVICES																									
RANGE MANAGEMENT - INVESTMENT	269	8723	8992	247	979	1226	247	979	1226	181	842	1023	49	441	490	28	252	280	1021	12216	13237	12	144	156	
- RECURRENT	3055	23024	26079	2656	11899	14555	2656	14184	16840	2376	11899	14275	2361	14184	16545	1036	11899	12935	14140	87089	101229	166	1025	1191	
RANGE & LIVESTOCK - INVESTMENT		13295	13295			0			0		12878	12878			0			0	0	26173	26173	0	308	308	
- RECURRENT	5859	32438	38297	5796	45188	50984	5910	45188	51098	5910	45188	51098	5910	32438	38348	4566	11188	15754	33951	211628	245579	399	2490	2889	
LIVESTOCK PRODN - INVESTMENT	10189	2504	12693	244	759	1003	975	708	1683	1825	708	2533	1825	708	2533	1825	708	2533	16883	6095	22978	199	72	270	
- RECURRENT	2044	14634	16678	1886	2692	4578		142	142	475	3277	3752	475	3277	3752	475	3277	3752	5355	27299	32654	63	321	384	
RANGE SUBTOTAL	21416	94618	116034	10829	61517	72346	9788	61201	70989	10767	74792	85559	10620	51048	61668	7930	27324	35254	71350	370500	441850	839	4359	5198	19.6
SIMP - INVESTMENT		44340	44340		629	629		3293	3293		629	629		1777	1777		61	61	0	50729	50729	0	597	597	
- RECURRENT	12	4442	4454	12	3592	3604	12	2742	2754	12	1892	1904	12	1892	1904	12	1892	1904	72	16452	16524	1	194	194	
TOTAL TECHNICAL SERVICES	21428	143400	164828	10841	65738	76579	9800	67236	77036	10779	77313	88092	10632	54717	65349	7942	29277	37219	71422	437681	509103	840	5149	5989	22.6
FIELD SERVICES																									
FIELD SERVICES - INVESTMENT	4617	78775	83392	4046	45024	49070	3408	27900	31308	2519	51895	54414	1998	16512	18510	1737	13882	15619	18325	233988	252313	216	2753	2968	
- RECURRENT	25048	27950	52998	28528	30275	58803	30641	31887	62528	35794	33344	69138	39165	34460	73625	41635	35235	76870	200811	193151	393962	2362	2272	4635	
EXTENSION - INVESTMENT	125	18363	18488			0			0		12528	12528			0			0	125	30891	31016	1	363	365	
- RECURRENT	11504	31827	43331	11929	22477	34406	12354	17377	29731	12354	16527	28881	12527	16527	29054	12952	16527	29479	73620	121262	194882	866	1427	2293	
AGROPASTORAL - INVESTMENT	8756	45632	54388	2503	2264	4767	3353	1931	5284	4203	10403	14606	4675		4675	5525		5525	29015	60230	89245	341	709	1050	
- RECURRENT	4868	27729	32597	5161	15931	21092	5721	16781	22502	5721	14231	19952	5721	14231	19952	5721	14231	19952	32913	103134	136047	387	1213	1601	
WATER DEVELOPMENT - INVESTMENT	1288	15910	17198	1670	25041	26711	1401	24926	26327	1359	24468	25827	1359	25381	26740	127	8880	9007	7204	124606	131810	85	1466	1551	
- RECURRENT	795	4973	5768	1002	5538	6540	1170	6592	7762	1422	7846	9268	1344	9076	10420	1428	10316	11744	7161	44341	51502	84	522	606	
TOTAL FIELD SERVICES	57001	251159	308160	54839	146550	201389	58048	127394	185442	63372	171242	234614	66789	116187	182976	69125	99071	168196	369174	911603	1280777	4343	10725	15068	56.9
ADMINISTRATION - INVESTMENT	11638	87860	99498		415	415		250	250		20524	20524			0			0	11638	109049	120687	137	1283	1420	
- RECURRENT	16464	34893	51357	11076	30643	41719	8401	30643	39044	10241	30643	40884	8502	34893	43395	8494	22143	30637	63178	183858	247036	743	2163	2906	
TOTAL ADMINISTRATION	28102	122753	150855	11076	31058	42134	8401	30893	39294	10241	51167	61408	8502	34893	43395	8494	22143	30637	74816	292907	367723	880	3446	4326	16.3
TRAINING	1158	23954	25112	890	17217	18107	890	16150	17040	170	16150	16320	170	14025	14195	170	765	935	3448	88261	91709	41	1038	1079	4.1
TOTAL BASELINE COSTS	107689	541266	648955	77646	260563	338209	77139	241673	318812	84562	315872	400434	86093	219822	305915	85731	151256	236987	518860	1730452	2249312	6104	20358	26462	100
ADJUSTED TOTAL (1/1/88 PRICES)	129227	557504	686731	93175	268380	361555	92567	248923	341490	101474	325348	426823	103312	226417	329728	102877	155794	258671	622632	1782366	2404998	7325	20969	28294	
PHYSICAL CONTINGENCIES	9046	39025	48071	6522	18787	25309	6480	17425	23904	7103	22774	29878	7232	15849	23081	7201	10906	18107	43584	124766	168350	513	1468	1981	
SUBTOTAL	138273	596529	734802	99697	287166	386864	99046	266348	365394	108578	348123	456700	110543	242266	352809	110079	166699	276778	666216	1907131	2573347	7838	22437	30275	
FINANCIAL CONTINGENCIES				9970	2872	12841	20800	5354	26153	35939	10548	46488	51303	9837	61140	67204	8503	75707	185216	37114	222330	2179	437	2616	
TOTAL PROJECT COSTS	138273	596529	734802	109667	290038	399705	119846	271701	391548	144517	358671	503188	161847	252103	413949	177283	175203	352485	851432	1944245	2795677	10017	22873	32890	

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TABLE 8 : PROJECT COSTS BY ITEM (SoSh'000)

ITEM / COMPONENT	TOTAL SoSh	TECHNICAL SERVICES	FIELD SERVICES	ADMINISTRATION	FORMAL TRAINING	TOTAL USD	%
VEHICLES	181822	32178	118206	31438	0	2139	8
MACHINERY & EQUIPMENT	183798	79838	92290	11670	0	2162	8
CIVIL WORKS	310712	1100	232027	77585	0	3655	14
LOCAL SALARIES & ALLOWANCES	324015	49810	242993	31212	0	3812	14
TECHNICAL ASSISTANCE & STUDIES	472377	227492	142885	102000	0	5557	21
FORMAL TRAINING	91709	0	0	0	91709	1079	4
VEHICLE & PLANT OPERATING COSTS	333968	32316	270758	30894	0	3929	15
OTHER OPERATING COSTS	350915	86367	181618	82930	0	4128	16
TOTAL	2249316	509101	1280777	367729	91709	26463	100

MINOR ERRORS DUE TO ROUNDING

and SRF programmes so that these could commence immediately the loan became effective. Agro-pastoral staff would attend an agro-pastoral study tour to Nigeria during the PPF period to visit ILCA's work in similar agricultural production systems.

4.38 Equipment for the SIMP programmes would be purchased during the PPF period, as would many of the inputs (seed, fertiliser and equipment) required to support the adaptive trials and seed multiplication programmes. Most seed would eventually be produced by the project, but varieties and cultivars need to be tested and multiplied as quickly as possible, hence the need for importation early in the PPF period.

4.39 The Extension Section would prepare and reproduce extension aids and equipment during the PPF period so that promotion of the proven interventions could proceed as soon as the project loan is negotiated. This equipment would include flip charts, posters, slide presentations and extension manuals on crop and livestock production. Preparation would be completed at headquarters, using equipment purchased early in the PPF period.

4.40 Funds for three expatriate staff in ongoing positions (Financial and Administration Manager, Chief Extension Officer and Master Mechanic) would be provided during the PPF period. This would enable the project to maintain the momentum and organisation necessary for an efficient and rapid start-up once the loan was approved. In addition, the Government of Somalia would fund local salaries, allowances and general operating costs to the value of SoSh 12.75 million.

4.41 Details on the PPF expenditure and further information on the programme and activities during the period are provided in Tables A7.1 to A7.23 in Annex 7, and summarised below in Table 9.

Environmental Impact

4.42 The project is designed with the twin objectives of conserving the natural resources of Central Somalia, and increasing the living standards, economically and environmentally, of the project area population. Some project activities, for example strip cropping, live fencing, village reserves, shelterbelts, tree planting and sand dune stabilisation, would directly improve the environment. Other activities, for example the construction of bores and

dugouts, would only take place after a careful assessment had been made that the area concerned would support the additional stock without degradation. The establishment of a long-term monitoring facility would enable deleterious trends to be identified and remedial measures taken. The project would develop, in conjunction with other concerned agencies, strategies to identify and reduce the impact of drought. This aspect would be assisted by the 16 automatic weather stations which would be installed by the project.

TABLE 9 : PPF FUNDING

	SoSh'000	US$'000 (@ SoSh 85 = US$1.00)
Equipment	23,939	282
Civil Works	12,550	148
Plant	9,748	115
Vehicle Operating Costs	4,123	48
Plant Operating Costs	1,265	15
Consumables	5,080	60
Other	1,173	14
Studies and Consultancies	19,775	232
Training	20,394	240
Flights and Contracts	13,736	161
Technical Assistance	13,025	153
Total	124,808	1,468

V. PROJECT IMPLEMENTATION

A. INSTITUTIONAL ARRANGEMENTS

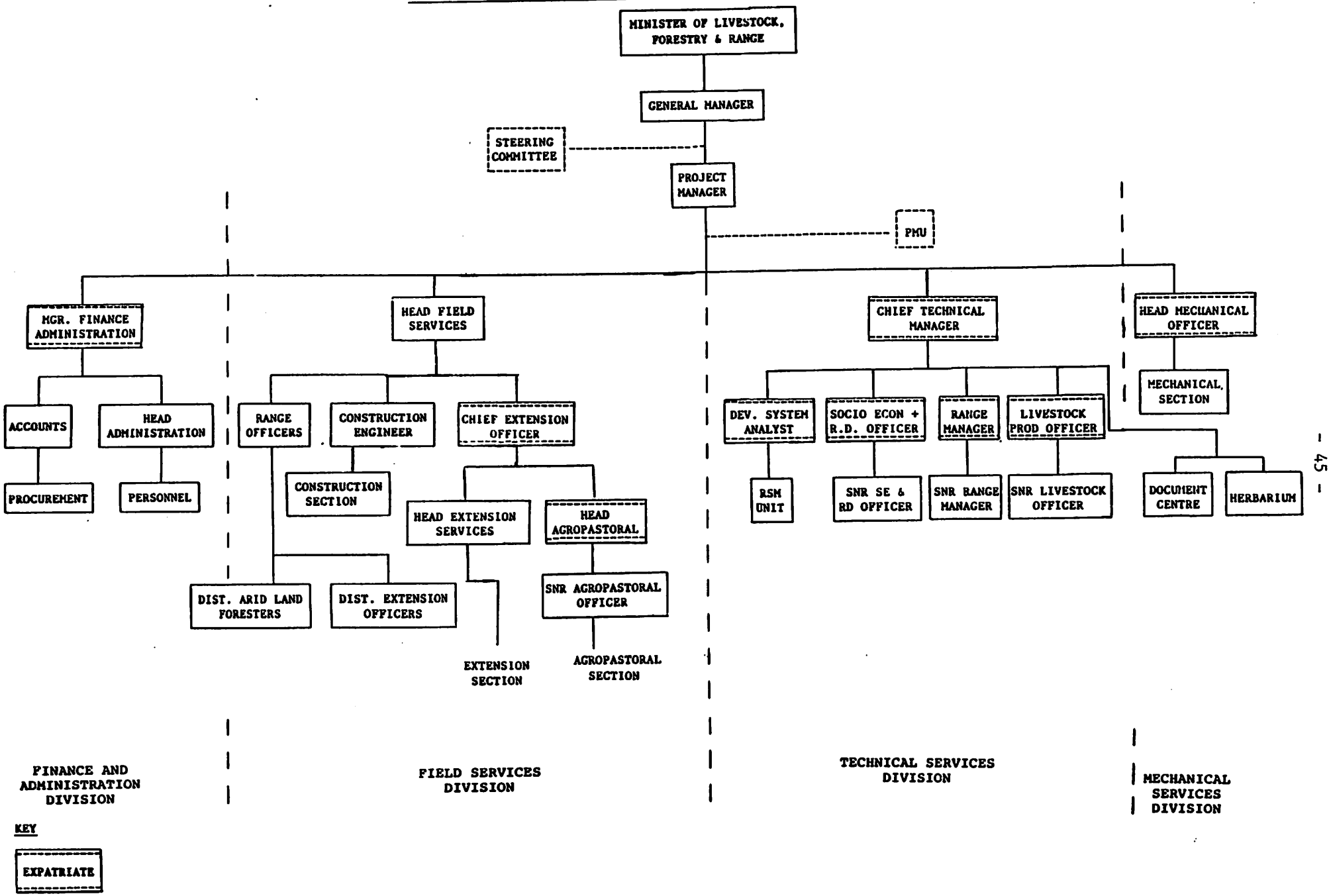
5.01 CRDP-II would be implemented by NRA utilising the CRDP-I organisation, amended as a result of past experience and in anticipation of future requirements. The Chief Executive of CRDP would be the Project Manager. Functionally, CRDP would be organised in four divisions, viz: Technical Services, Field Services, Mechanical Services, and Finance and Administration. The Head of each Division would report to the Project Manager. All other staff would report through their respective Divisional Heads. The long-term capacity of NRA (post-CRDP) to support and guide resource development in the Central Rangelands would depend primarily on the extent to which CRDP strengthened the Field Services Division, and secondarily, on the development of a strong cadre of indigenous Technical Specialists in the Technical Services Division. All SIMP programmes and all extension and agro-pastoral activities would be co-ordinated through the Field Services Division.

5.02 The overall organisation of CRDP-II is shown in Figure 1 which reflects the structure which would be in place when CRDP-II was fully effective. During the first six months of 1988, which might coincide with project commencement, the USAID technical assistance staff extended from phase I would be finalising their inputs. To avoid confusion, these positions have not been included in Figure 1.

Project Steering Committee (PSC)

5.03 The responsibilities of the Project Manager are large and to ease his task the organisational support of CRDP-II would include two supportive committees, the senior of which (the Project Steering Committees (PSC)) would act in much the same way as a Board of Directors. The PSC would be the policy-making body within CRDP. It would meet twice yearly to review and approve project plans, evaluate progress, co-ordinate donor activities, and discuss and resolve major issues. The Chairman of PSC would be the General Manager of NRA; the Executive Secretary would be the Project Manager, CRDP; and members would comprise representatives of the donors, representatives of the Ministries of Planning, Finance and Agriculture, the Chief Technical Manager from CRDP, and the Manager of Finance and Administration, CRDP. The PSC would, when appropriate, invite other parties to discuss particular matters.

FIGURE 1 : CENTRAL RANGELANDS DEVELOPMENT PROJECT PHASE-II PROPOSED ORGANISATION



Quarterly Management Meetings

5.04 There is a need for a better understanding of CRDP's activities and operations by NRA and NRA's senior staff (non-CRDP). Therefore, CRDP-II would hold quarterly management meetings attended by NRA's Directors and Division Heads from CRDP. The General Manager of NRA or the CRDP Project Manager would chair these meetings which would review project performance and activities and discuss the quarterly reports prepared by the project's evaluation unit. These meetings would encourage dialogue between NRA and CRDP-II and make sure that NRA's senior staff are aware of CRDP's progress, problems and achievements.

Project Management Unit (PMU)

5.05 An entirely "in house" committee, the Project Management Unit, would provide the Project Manager with a regular opportunity to review project progress, difficulties and programmes with senior project staff on a formal basis. The PMU would meet not less than once a week. It would comprise: Chairman - the Project Manager, Vice-Chairman/Secretary - Chief Technical Manager. Members would be: the Manager of Finance and Administration, the Head of Field Services, the Chief of Extension Services, and three senior Somali technical staff. This committee would be advisory in nature.

Strengthening of CRDP Staff

5.06 An important aspect of the administrative arrangements for CRDP-II would be the strengthening of the technical and managerial capacity of the national staff. This would be achieved through formal and informal training, and also through significant on-the-job experience. At least one, and preferably two or more, Somali staff would work with each expatriate, and one would take over each position at the completion of the expatriate's contract. The selection of an appropriate officer to head the Field Services Division would be very important to the success of phase II.

The Divisions

5.07 The major aspects of the staffing and responsibilities of the four divisions are discussed below:-

(a) Technical Services Division

The Technical Services Division would combine, under the Chief Technical Manager, all the data collection, resource analysis,

investigatory planning, formulation of programmes and some training aspects of the project. None of these activities would be conducted in isolation, all would be carried out in conjunction with other appropriate divisions, generally on a systems approach. The Chief Technical Manager would be responsible for the effective execution of all the Division's activities. The Technical Services Division would contain the Subject Matter Specialists, who would be supported in the work of training and advising the District Extension Officers by the Technical Specialists and their associated counterpart senior officers. In addition, the Development Systems Analyst would be responsible for the Remote Sensing and Monitoring (RSM). The Socio-Economist would be responsible for project monitoring and training, as would the other specialists (the Chief Extension Officer, the Range Manager, the Livestock Production Officer, and the Head Agro-Pastoralist, and their respective associated senior officers). All these staff would form the core of the SIMP and provide most of the direction, and some of the direct input, into the studies and programmes. The majority of the staff in the Technical Services Division would be based in Mogadishu, but they would be required to travel extensively in the project area. SIMP would be facilitated by the provision of two mobile base camps which would be located in the areas being studied.

(b) Field Services Division

The Field Services Division comprising Field Services, Extension, Construction and Agro-pastoral Sections would, under the Head of Field Services, be responsible:-

(i) Through the Construction Engineer for the construction activities of CRDP, for the maintenance of roads, for dugout construction and for the operation of the bore maintenance team (larger mechanical repairs would be carried out by the Mechanical Services Division[1/]).

(ii) Through the Range Officers situated at regional and district headquarters, for the activities of the District Arid Land Foresters and the District Extension Officers, who in turn would assist the Village Extension Workers to extend project interventions to project beneficiaries.

1/ Major repairs to boreholes would be contracted out.

(iii) Through the Head of the Agro-pastoral Section for all activities associated with seed production, adaptive trials, species screening, demonstration of successful interventions, and village-based development which focused on environmental conservation.

(iv) Through the Head of the Extension Section for the provision of back-up support in the form of extension materials and aids (including audiovisual materials) and training in extension methodology and the development interventions promoted by the project.

All SIMP teams would include Technical Specialists from the Technical Services Division, together with the existing or future District Officers who would become knowledgeable about their district, not only through participation in a SIMP team, but also through the pre-development surveys in the following year. Many of the staff in the Field Services Division would be located in district and regional headquarters, or in auxiliary facilities. The senior extension and agro-pastoral staff would be in Mogadishu.

(c) Finance and Administration Division

The expatriate Manager of the Finance and Administration Division would be responsible for the control of finance, accounting and administrative matters, including procurement, store records and training within the Finance and Administration Division. This Division would provide appropriate and timely financial records in accordance with the requirements of the Somali authorities, the Project Manager and the donors. The Division would also supervise cost recovery activities, refer Section B.

(d) Mechanical Services Division

This Division would maintain all the project vehicles, heavy equipment and borehole engines and pumps in good working condition, order all spare parts in a timely fashion, maintain and keep a detailed spare parts stock record, and build-up and maintain a team of experienced staff.

B. COST RECOVERY

5.08 The recovery of some recurrent costs would be an important feature of the project. NRA/CRDP cannot be expected to fund ongoing maintenance of water facilities, and similarly Somalia cannot afford to supply improved varieties of crop and forage seed, and tree seedlings free of charge. Therefore, the project's Finance and Administration Manager would set up and implement cost recovery systems for project activities which, once established, would be capable of generating some revenue to fund ongoing programmes. RLAs and village committees would be the organisations through which these cost recovery programmes would function. Further details are in Annexes 2, 3 and 5.

C. TECHNICAL ASSISTANCE AND STUDIES

Technical Assistance

5.09 Somalia has a shortage of nationals trained and experienced in range management, agro-pastoralism, extension and associated skills. The position is improving and more Somalis are being trained. However, if CRDP-II is to meet its objectives, there would be a need for assistance from internationally recruited personnel. Expatriate staff input would total 47 man-years. Five of the expatriates would be in the Technical Services Division. This would reduce the number of expatriates reporting directly to the Project Manager to three, and would, simultaneously, increase the opportunity for expatriates to contribute to the strengthening of the Field Services Division whilst at the same time avoiding the difficulties which might occur for NRA/CRDP in the long-term, if too many expatriates were appointed to line positions in the Field Services Division.

Studies

5.10 Short and medium-term consultancies would amount to 8 man-years and are detailed in Annex 7, Tables A7.1-A7.23. These would strengthen all components and provide significant additional training.

D. ANNUAL WORK PROGRAMME

5.11 Preliminary discussions in the PSC in relation to annual work programmes for the following fiscal/project year would take place within the April/June period each year. Division Heads would then have to prepare their annual work

programmes and budgets not later than four months before the start of the fiscal/project year, and in time for the next PSC meeting in the October/December period. Forecasts of revenue from cost recovery programmes under the project would be included in the budget. The Socio-Economist would be responsible for the format (but not the content) of annual work plans. In consultation with the Manager of Finance and Administration, the Socio-Economist would ensure that the methodology used for the construction of annual work plans was compatible with the needs of the former, having regard to donor reporting requirements.

E. MID-TERM REVIEW

5.12 The project has been designed with full regard to the experience gained in phase I. However, the targets are ambitious and broad, and despite careful planning and adequate funding may, for a variety of reasons, not be achieved. Many of the interventions planned for phase II have yet to be completely proven, and the SIMP procedure may, on the basis of experience, require adjustment. It would be impossible to provide in advance for all these possibilities, so a mid-term review would therefore be held early in project year 5 to review progress to-date, to examine the programme for the remainder of the project, and make adjustments as necessary.

F. MONITORING, EVALUATION AND REPORTING

Monitoring

5.13 Monitoring of project performance (excluding the ongoing monitoring of the ecological status of the range) would be co-ordinated by the Rural Development Socio-Economist through the Chief Technical Manager and the Project Manager. This activity would record the project's physical achievements on a quarterly and annual basis and relate back to the project's accounts so that unit costs could be determined. The field staff (VEWs) would collect the basic monitoring data as part of their regular activities and forward it to their supervising DEOs, who in turn would collate the data for their area and forward it though the district offices to headquarters.

Evaluation

5.14 The Rural Development Socio-Economist would also set up a system of surveys to gauge the impact of the project on the target population. The

surveys would focus on selected key factors such as the proportion of agro-pastoralists using improved cropping practices and the percentage of contact pastoralists deworming sheep and goats. Regular up-dating of production system models (refer Annex 8) as data were collated would allow periodic re-assessment of financial and economic rates of return. Data on acceptance rates, etc., collected from surveys, would be matched with monitoring data and details on project expenditure (by component) to determine if the project is achieving the estimated economic benefits and reaching the predicted number of pastoral and agro-pastoral families.

Reporting

5.15 Quarterly and annual reports would record project achievements, expenditure, progress and problems. The Rural Development Socio-Economist would devise standard reporting formats and procedures for all Divisions so that duplication is avoided and comparison between time periods possible. Each Section Head would be responsible for preparation of these reports, which would be collated by the Project Manager, the Chief Technical Manager, and the Financial and Administration Manager into a report for donors and Government agencies. Detailed procedures for reporting (monitoring and periodic up-dates following receipt of evaluation data) would be finalised early in year 1 and explained to the staff responsible for reporting, within three months of project commencement.

VI. PRODUCTION, MARKETS AND FINANCIAL RESULTS

A. PRODUCTION

6.01 The project would increase output of pulses, meat and milk to the extent shown in Table 10.

TABLE 10 : INCREMENTAL PRODUCTION OF PULSES, MILK AND MEAT

	Project Year								
	1	2	3	4	5	6	Ave. 7-10	Ave. 11-15	Ave. 16-20
Mungbeans (t)	46	110	259	434	739	1,029	2,130	4,360	6,870
Cowpeas (t)	324	359	775	807	1,282	1,362	2,010	2,720	3,390
Total Pulses (t)	370	469	1,034	1,241	2,021	2,391	4,140	7,080	10,260
Milk (l'000):									
- from Water Dev.	-	639	1,278	1,917	2,557	3,196	4,790	6,390	6,390
- from Forage Dev.	-	17	47	104	183	302	790	2,330	5,110
Total Milk	-	656	1,325	2,021	2,740	3,498	5,580	8,720	11,500
Meat (t lwt):									
- from Water Dev.	-	-	137	274	411	547	890	1,230	1,230
- from Deworming	20	35	52	72	95	120	180	280	350
- from Forage Dev.	-	4	10	22	39	64	170	500	1,090
Total Meat	20	39	199	368	545	731	1,240	2,010	2,670

Source: Annex 8, Tables A8.5 to A8.15.

6.02 Crop production is expected to respond to project interventions more rapidly than livestock production. Incremental pulse output would reach 1,000 tonnes per annum by year 3 and 2,400 tonnes by the end of the disbursement period. Pulse production is expected to continue to increase thereafter, due to continued adoption of the improved agronomic practices by families not directly contacted during the disbursement period. By the end of the project life, incremental pulse production would exceed 10,000 tonnes per annum. About two-thirds of incremental output would be mungbeans and the remainder cowpea. The former is a new crop in the project area but is agronomically proven and acceptance problems are not anticipated.

6.03 Milk production, mainly from goats, would increase as a result of water and forage development. The former activity would generate greater milk output initially because it would permit additional females to be retained for milking. The forage programme would have little impact on milk output until after the

disbursement period. At full development, incremental milk production would reach 11,500 tonnes per annum, of which a little more than half could be attributed to water development, and the remainder to forage development.

6.04 Meat production would also increase slowly. Whilst deworming would have a rapid impact, subsequent gains would be less rapid than from other interventions and at full development deworming would only contribute 13% of incremental meat production. The remainder, in approximately equal proportions, would be attributed to the water and forage development programmes. Total incremental meat production would reach 730 tonnes per annum by the end of year 6, average about 2,000 tonnes per annum between years 11 and 15, and stabilise at around 2,670 tonnes towards the end of the project period.

B. MARKETS

6.05 Domestic and export markets are expected to easily absorb incremental production without a significant impact on prices, and without placing an excessive burden on marketing infrastructure. The project area has a deficit in basic foods and incremental pulse production would be consumed by the beneficiary families, or if sold, would supplement the meagre supplies currently passing through local village markets. It is unlikely that a significant amount of the incremental pulse output would move outside the project area.

6.06 Mungbeans are a new crop in the project area, but are expected to be readily accepted as a foodstuff for home consumption, or local marketing. The local population have become accustomed to a wide variety of imported and domestically produced pulses, including types very similar to mungbeans.

6.07 Incremental milk production would be consumed by agro-pastoral and pastoral families, amongst whom it is a preferred food. Incremental livestock production would be readily absorbed within the existing domestic and export marketing channels.

C. FINANCIAL RESULTS

Impact on Pastoralists and Agro-Pastoralists

6.08 The project would generate modest but very attractive financial results for its beneficiaries. The project area population has few other development opportunities and are therefore expected to readily accept the proposed

interventions. The net value of incremental production per family would vary according to the combination of development interventions which are available and adopted by target families.

6.09 The value per family of incremental production would be as follows:-

	Year 1	Year 10	Year 20
Increased milk and meat production from forage development	-	SoSh 10,900	SoSh 24,500

	Year 1	Year 5
Increased pulse production	SoSh 9,800	SoSh 12,700

	Year 1+
Increased annual meat production from deworming	SoSh 920 (net) on agro-pastoral sands
	SoSh 390 (net) on agro-pastoral clays
	SoSh 850 (net) on coastal plains.

6.10 In addition, some families would benefit from water development, with the extent of their financial benefit being proportional to the size of their herds/flocks and proximity to the new watering points.

6.11 The financial rates of return to participating households would be very high (over 50%) as negligible incremental investment in cash items, materials or labour would be required to generate the above benefits. Households which are able to adopt the forage development and food crop production interventions on APCs would receive increased incomes of SoSh 12,800 by year 10[1/] and SoSh 18,600 by year 20[1/]. Whilst modest in absolute terms, the prospect of increases of this magnitude would be highly attractive to the low-income families in the project area, especially as participation would involve minimal on-farm investment risk.

1/ Assuming that 50% of the incremental production (meat and grain) was consumed, and 50% sold.

VII. BENEFITS AND JUSTIFICATION

7.01 The project would continue and expand the initiatives developed under CRDP-I and conduct further studies to identify new interventions which would help pastoralists and agro-pastoralists to increase their sustainable production levels.

7.02 The following number of families would participate in the productive interventions by years 10 and 20 of the project:-

Intervention	No. of Participating Families	
	Year 10	Year 20
Deworming	18,300	31,370
Forage Development	1,920	29,880
Improved Cropping Practices	12,920	29,880
Water Development	(not known)[1/]	

7.03 By year 20 about 61,250 low-income pastoral and agro-pastoral families would receive modest but sustainable improvements in income and food consumption levels. These improvements would be released from increased animal production and incremental production of food crops.

7.04 The value of increased food crop production per agro-pastoral family cropping on APCs would increase from SoSh 9,800 in the first year of participation, to SoSh 12,700 five years after accepting the intervention. The increased value of livestock products after forage development on an APC would be SoSh 17,900 per family, 15 years after the first area of buffel grass was planted.

7.05 The project would also help to limit the rate of environmental degradation in the Central Rangelands, which is an important item in the national resource inventory. This would be achieved through dune stabilisation, strip cropping, establishment of useful vegetative cover on cultivation areas at the end of the cropping cycle, strategic location of new temporary and permanent watering points, and improved range management techniques. At the same time an extensive tree planting programme in and around villages would help to reduce

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1/ Not possible to determine how many families would benefit from increased water supplies.

wind and dust within the villages and create a more hospitable living environment.

7.06 The project would further strengthen NRA/CRDP, which is the major institution responsible for the management of Somalia's rangelands. The technical assistance and training components would help to develop a group of skilled staff with the training and experience required for effective long-term management of the nation's rangeland and livestock resources.

7.07 The project would also generate increased export earnings through livestock exports and reduce the dependency on cereal imports. At full development, net economic benefits would amount to SoSh 619 million per annum. The economic rate of return is estimated to be 8.9%. Annex 8, Tables A8.8 to A8.19 show how this rate of return was estimated. Economic benefits include incremental meat, milk and pulse production. Incremental meat is valued partly at export parity prices and partly as a non-traded good. Both milk and pulses are regarded as non-traded goods. Other unquantified benefits, which are not included in the economic analysis, include the benefits from institution strengthening and training, the development of a better understanding of factors affecting range productivity, greater environmental stability, flow-on effects from the spontaneous adoption of new technology by pastoralists and agro-pastoralists not directly contacted by the extension system, and the development of new interventions during the project as a result of the extensive trial programme.

7.08 The effect of changes in the key assumptions on the economic rate of return is as follows:-

	ERR
Basic assumptions	8.9%
Benefits up 10%	10.3%
Costs down 10%	10.5%
Benefits up and costs down	11.9%
Benefits down 10%	7.4%
Costs up 10%	7.5%
Benefits down 10% and costs up 10%	6.0%
Benefits lagged 1 year	6.9%
Benefits down 10% and lagged, costs up 10%	4.3%

	ERR
Reduction in benefits to reduce ERR to zero	- 46%
Increase in costs to reduce ERR to zero	+ 86%

7.09 It is concluded that the project is economically viable in relation to alternative investment opportunities in Somalia.

VIII. RISKS AND ISSUES

8.01 Typically, range/livestock projects are subject to a wide spectrum of climatic, husbandry and economic risks. CRDP-II has been designed to minimise risk; it is widely dispersed with a range of crop, fodder, livestock and conservation interventions, and would take advantage of the experience of phase I. Whilst overall project design is ambitious with respect to scope, it is conservative in the estimation of anticipated benefits. The main areas of risk would relate to project management. The PSC, PMU and expatriate specialists would all assist the Project Manager and senior Somali staff to ensure that a good management regime prevails. Given the size of the project area, the dispersion of the beneficiaries, the poor communications, and the generally low level of other services, the possibilities for delay and disruption in the achievement of project objectives would be significant.

8.02 The greatest opportunities for increased production in the project area would be in the agro-pastoral system. Gross expansion of the cropped area without commensurate attention to conservation issues could result in increased desertification. The project would not encourage expansion of the cropped area but might, through successful interventions, influence the move to increased cropping. The strong extension and agro-pastoral activities have been designed to minimise any risk of increased desertification, and reverse present trends.

8.03 The position of Head of the Field Services Division is one of the key positions in the project. The Somali appointed to this position would have to be very experienced and capable because he would be responsible for all field activities (the inter-face between the project and the target population). Furthermore, he would need to be capable of delegating authority to avoid administrative delays to the project's implementation programme.

8.04 RLAs are the key organisations at the field level through which the project would be implemented. Progress would depend on the timely formation of RLAs and establishment of a mechanism which facilitates and controls the flow of supportive funds to RLAs.