

PDBBE 264

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number

1

DOCUMENT CODE

3

COUNTRY/ENTITY
Somalia

3. PROJECT NUMBER
649-0108

4. BUREAU/OFFICE
AFR 06

5. PROJECT TITLE (maximum 40 characters)
Central Rangeland Development Project

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)
MM DD YY
06 30 89

7. ESTIMATED DATE OF OBLIGATION
(Under "B." below, enter 1, 2, 3, or 4)
A. Initial FY 79 B. Quarter 4 C. Final FY 88

8. COSTS (\$000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY 79			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	1,000		1,000	14,444		14,444
(Grant)	(1,000)	()	(1,000)	(14,444)	()	(14,444)
(Loan)	()	()	()	()	()	()
Other U.S. 1.						
Other U.S. 2.						
Host Country					9,000	9,000
Other Donor(s)				25,300		25,300
TOTALS	1,000		1,000	44,744	9,000	44,744

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1)	EN 110	210	-	14,444	-			14,444	-
(2)									
(3)									
(4)									
TOTALS				14,444	-			14,444	-

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters).

The project will assist the GSDR in: (i) improving rangeland and livestock productivity through the introduction of range management, livestock water supplies and improved veterinary services; (ii) gain the confidence and cooperation of pastoralist through non-formal training; and (iii) improve GSDR's ability to implement range development by training of staff at all levels and providing technical assistance

14. SCHEDULED EVALUATIONS

Interim MM YY 05 83 MM YY 06 87 Final MM YY 06 89

15. SOURCE/ORIGIN OF GOODS AND SERVICES
 000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP. Amendment.)

I concur in the methods of implementation and the financial arrangements under this project.(see Table 10 page 34)

George Barwicke
George Barwicke, A/Controller

17. APPROVED BY
Signature: L.A. Cohen
Title: Mission Director
Date Signed: MM DD YY 07 22 86

18. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION:
MM DD YY

ACTION MEMORANDUM FOR THE MISSION DIRECTOR

DATE : July 2, 1986

FROM : W. P. Warren *W*

SUBJECT: Central Rangelands Development Project Amendment
(649-0108)

PROBLEM

Your approval is requested of the attached project paper amendment for the Central Rangelands Development Project (CRDP) to extend the PACD from September 30, 1986 to June 30, 1989 and to reallocate resources between project components. No additional funding is required.

BACKGROUND

The CRDP project was approved in August 1979 for a life of project (LOP) of US \$14,944,000. The project is multi-donor, support being provided also by GSDR, IDA, IFAD, GTZ and WFP. The six year project had a total funding of \$45.2 million. The purpose of the project is to improve rangeland and livestock productivity through the introduction of improved management practices, training pastoralists in these practices and providing technical assistance and facilities to the National Range Agency (NRA), the institution responsible for implementing this project. Also technical assistance and participant training was to be provided to the Faculty of Agriculture of the Somalia National University to develop a Botany and Range Department.

Originally the project was to include the entire area of the three regions of the CRDP. However, because of the complexity of coordinating the various project components and security problems in some areas three priority districts making up 26 percent of the total area were selected for concentrating project activities. This action and the eventual formation of a Project Management Unit within the NRA finally got USAID funded project activities off to a belated start one and one half years after project inception.

The mid-term review in March 1984 by the donors found it necessary to recommend reorientation of the project. This recommendation was based on the following:

1. Significant slippage in project start up since the AID consultants were not appointed until 18 months after the project became effective.
2. The consultants inception report (4/82) recommended several technical and logistical changes and the consultants were implementing the project based on the inception report instead of the project paper.
3. USAID evaluation (5/83) differed on several technical and procedural points with the inception report. The Range and Water development component is the most crucial in generating the overall projects main benefits. Because of the differences in perceptions of objectives and benefits, and the significant differences in technical and implementation approaches - it was the broad consensus that there would be no direct benefits from the range and water components in the projects lifetime, if it continued on in its present mode.

It was suggested that these components be adopted to a pilot research effort in order to establish a firm technical base for the longer term.

4. Poor management and leadership by NRA/CRDP and security had brought the project to a stand still by January 1984.
5. The Formal Training Component had been delayed until March 1982 when the consultant arrived. The USAID evaluation (5/83) recommended expansion of this component to provide a more sustainable teaching program and to develop and implement range management research. However, NRA would not release the resources to the university. There was also disagreement between USAID and the university on the type and cost for the new classrooms and offices for the range management activities.

To satisfactorily overcome the constraints to the project, the following key problems had to be addressed:

- Project size, complexity, design and geographical dispersion
- Project organization/management
- Anticipated benefits

The mid-term review mission recommended ways to reorient the project that would address the key problems to overcome the various constraints. These recommendations were accepted and implementation moved along accordingly. Although the project has made great strides in progress towards the goals brought about by the reorientation, formal documentation was never completed to sanction the changes.

DISCUSSION

A. The Project

The project as it has evolved is still basically consistent with the original Project Paper (PP). The most significant deviation from the PP was the result of the decision to concentrate project activities in only three of the 13 districts of the CRDP. During the extension of the project most activities will be transferred to three additional districts and eventually to all districts by the NRA. A project wide range monitoring system will be put into place during the extension period. A great deal of information and practical experience has been accumulated by the various project components on the nature, function and practical implications of rangeland production systems of the CRDP area. This knowledge and experience will provide the basis and confidence for accelerating future activities.

The inputs devoted to the next three years are basically what was originally planned in the PP. The Formal Training Component (FTC) includes the range trials and research work. The FTC participant trainees will be returning in mid 1988 to take over teaching and research responsibilities now being provided through technical assistance. Soil and Water Conservation activities are somewhat broader than what was planned. In addition to developing water spreading sites, dunes will be planted for stabilization, village shelter belts planted and related tree nurseries established, seasonal stock water points will be developed and wells dug and/or rehabilitated. Inputs into the ecological survey activities will be substantially greater than originally planned. Overall technical assistance will be 21 percent greater. Animal husbandry and sociological work has been added.

Funding requirements for the extension of the project will be 4.85 million dollars. The source of the funds will be the remaining unearmarked, uncommitted, and the non accrued funds in the TA contracts and PIOs as of July 1, 1986. The amount of remaining funds that will be available from these sources will be no less than 4.85 million dollars.

The goal and purpose of the project are unchanged. The outputs under the range development component are reduced in scope to correspond with the reduction from three regions to the original three districts plus three more new districts. The original plans for range, famine and village reserves are referred to only as range reserves in the future activities. Estimates on the need for total boreholes have been reduced due to a better understanding of the ground water status through project activities.

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According to technical advice now evolving from project experience, there are enough boreholes in the three priority districts and future boreholes should be limited in number and well planned. To meet stock water needs, surface catchments and shallow wells will be dug or rehabilitated. These types of water supplies are easier to construct, less costly and have less of a negative effect on the environment than boreholes. The surface water catchments are included as part of the water conservation activities. Future soil and water conservation activities will focus on more than water spreading demonstrations. Soil stabilization will be focused on nurseries development, and the planting of village shelter belts and planting for sand dune stabilization.

Two technical components that were alluded to in the original PP will now be realized during the remainder of the project. The original PP discussed the need for animal husbandry work and sociological work that would be required to help the project to be successfully implemented. Unfortunately those two positions were never included in the technical assistance package. During the course of the project the services of an animal husbandry specialist and a sociologist were greatly needed and they were provided in the remainder of the project. The animal husbandry specialist will focus on livestock surveys and herd monitoring, to provide basic information that is needed by the other project components. The rural sociologist will concentrate primarily on establishing a sociological component within CRDP that will continue to address sociological constraints to project implementation. The rural sociologist will work with Somali sociologists and project staff on how to overcome the sociological constraints that exist in the central rangelands that impede project implementation.

The formal training activities are focused at the Faculty of Agriculture. A range science faculty will be trained and up to twenty five BSc degrees in Range Science can be earned each year from the FOA. NRA's current needs estimate is approximately 450 BSc level range trained staff. At least 50 will be graduated during the course of the project.

There will be an increased emphasis on in-country short term training and on-the-job training for project staff. There will also be more emphasis placed on documentation of project research results. A collaborative effort with the International Livestock Center for Africa (ILCA) will be formalized to assist on the coordination of research efforts and monitoring. Range monitoring will include the use of satellite and aerial photography. This technology will allow for more complete coverage of the central rangelands, which would never have been possible with the resources originally provided.

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The CRDP requires the following inputs (which have been realigned and modified):

<u>USAID Contribution:</u>	<u>US \$ Equivalent:</u>
1. Technical assistance (TA) including: 52.5 person years (P/Y) of long and short term TA consisting of ecologists, livestock specialists and range science professors.	7,994,000
2. Commodities including: aerial surveys, books and teaching supplies, four wheel drive vehicles, camping and survey equipment, trucks, tractors, and pumps.	3,952,000
3. Participant training including: long term BSc, MSc, and PhD training in the USA and short term in-country training, and third country training.	1,166,000
4. Field Support Unit:	1,037,000
5. Evaluation: an evaluation is planned for mid 1987.	100,000
 SUBTOTAL:	 14,249,000
Contingency/inflation:	<u>195,000</u>
 AID TOTAL	 \$14,444,000

<u>GSDR Contribution:</u>	<u>US \$ Equivalent:</u>
1. Technical assistance operating and support including: vehicles, fuel and vehicle maintenance; offices and renovations, office equipment, supplies and utilities; local salaries and allowances; and counter part staff.	
GSDR TOTAL	<u>9,000,000</u> <u>\$9,000,000</u>

Other Donor Contribution:US \$ Equivalent:

1. Technical assistance including:
veterinary services, nonformal training,
forestry, management and vehicle
maintenance.
2. Infrastructure including: NRA
headquarters, regional and district
offices.

Other Donor Total

\$25,300,000

Project Total:

\$48,744,000

As of July 1, 1986 there will be the following funds still available for project implementation:

Project unearmarked funds	2,450,000
FTC uncommitted funds	1,127,000
LBII contract non accrued	1,273,000
	<u>\$4,850,000</u>

There will be some funds yet to be identified that will become available as PIO's are closed. These funds will go into contingencies until specific needs are identified in technical assistance, training or commodities.

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The proposed financial plan for funding the extension of the CRDP amendment is as follows:

FINANCIAL PLAN

<u>Projects Inputs</u>	<u>AID Grant (\$000)</u>	<u>GSDR (\$ Equiv.)</u>
1. Technical Assistance- (Range)-LBII, ILCA, Consultants	2,225	-0-
2. Training (Range) -long and short term	300	-0-
3. Commodities -(Range)	500	-0-
4. FSU-(Range)	345	-0-
5. Formal Training (FOA) -technical assistance (805) -commodities (200) -FSU (180)	1,185	-0-
6. Evaluation	100	-0-
7. Local TA, operations and support	-0-	6,000*
8. Contingency	195 <u>4,850</u>	-0- <u>6,000*</u>

*The GSDR agreed to provide the equivalent of US \$9 million for local technical assistance, operations and support for CRDP. By June 30, 1986 approximately US \$3 million will have been provided and approximately \$6 million will be remaining for the remainder of the project.

B. Conditions Precedent and Covenants

The conditions precedent contained in the original CRDP project agreement remain unchanged. All of these conditions precedent have been met by the GSDR. There are no additional conditions precedent contemplated for the remainder of the project.

In addition, the special covenants contained in the original ProAg remain the same.

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C. Project Committee

The USAID project committee on April 17, 1986 determined that the CRDP amendment has adequately examined, addressed and justified the CRDP evolution and future activities. The amendment has adequately responded to the regional legal advisors comments as provided in the attached cable and memoranda. The project committee determined that the amendment adequately justifies the proposed changes in the project, and due to delays in start up of the project, agrees that the PACD should be extended to June 30, 1989 to allow for a satisfactory completion and an orderly phase out of project activities. The original IEE is still adequate for the remaining project activities.

There are no special waivers which require authorization.

Recommendation: That you approve the attached Project Paper Amendment, and approve extension of the PACD from September 30, 1988 to June 30, 1989.

Approved
Disapproved
Date


JUL 22 1988

Attachments: A project Paper Amendment

(649-0108)

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Abbreviations and Acronyms

AVHRR	Advanced Very High Resolution Radiometer
CRDP	Central Rangelands Development Project
FOA	Faculty of Agriculture
FSU	Field Support Unit
GSDR	Government of the Somalia Democratic Republic
IRR	Internal Rate of Return
LRS	Livestock and Range School
NOAA	National Oceanic and Atmospheric Administration
NRA	National Range Agency
PACD	Project Assistance Completion Date
PIL	Project Implementation Letter
PP	Project Paper
PY	Person Years
RLA	Range and Livestock Association
So.Sh.	Somalia Shilling
SY	Student Years
WDA	Water Development Authority

Central Rangelands Development Project

Project Paper Supplement

(649-0108)

Summary

The Central Rangelands Development Project (CRDP) was initiated in August 1979 as the first phase of a long-term development project. This, the first phase, was designed as a six year 45 million dollar project of which 15 million dollars was to be funded by USAID. The purpose of the project is to improve rangeland and livestock productivity through the introduction of improved management practices, training pastoralists in these practices and providing technical assistance and facilities to the National Range Agency (NRA), the institution responsible for implementing this project. Also technical assistance and participant training was to be provided to the Faculty of Agriculture of the Somalia National University to develop a Botany and Range department.

Originally the project was to include the entire area of the three regions of the CRDP. However, because of the complexity of coordinating the various project components and security problems in some areas three priority districts making up 26 percent of the total area were selected for concentrating project activities. This action and the eventual formation of a Project Management Unit within the NRA finally got USAID funded project activities off to a belated start one and one half years after project inception.

The character of the project as it has evolved is generally consistent with the Project Paper (PP). Inputs devoted to and proposed during the extension for the Formal Training Component including range trials and research work are about what was planned. Participant trainees will be returning mid 1988 to take over teaching and research responsibilities now being provided through technical assistance. Soil and Water Conservation activities are somewhat broader than what was planned. In addition to developing water spreading sites, dunes have been stabilized, village shelter belts planted and related tree nurseries established, seasonal stock water points have been developed and wells dug and/or rehabilitated. Inputs into the ecological survey activities will be substantially greater

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than originally planned. Technical assistance will be 21 percent greater. Animal husbandry and sociological work has been added. The most significant deviation from the PP was the result of the decision to concentrate project activities on only three of the 13 districts of the CRDP. With the extension of the project most activities will be transferred to three additional districts and eventually to all districts by the NRA. A project wide range monitoring system will be put into place during the extension period. A great deal of information and practical experience has been accumulated by the various project components on the nature, function and practical implications of rangeland production systems of the CRDP area. This knowledge and experience will provide the basis and confidence for accelerating future activities.

Five hundred thousand dollars will be deobligated which will leave about 4.85 million dollars remaining in the project July 1, 1986 for funding the remaining activities. The source of the funds required for covering the additional costs of technical assistance, participant training and commodities are other budgetary line items. Operating and capital costs totaling almost 3.0 million dollars have been and are being funded with counterpart funds and the Comprehensive Groundwater Development Project respectively. Inflation and contingency line items of the PP provide an additional 4.0 million dollars. The long term technical assistance will terminate by September 30, 1988 but the Project Assistance Completion Date (PACD) will be extended through June 30, 1989 to cover participant training costs, both long-term and short-term and consultancies.

I. Background

The Central Rangelands Development Project (CRDP) was initiated in August, 1979 as the first phase of a long-term rangeland development activity. This phase was designed as a six year 45 million dollar project of which 15 million was to be funded by USAID. The objective being to increase livestock production (off take) in Somalia's vast central rangelands area and thereby improving income and welfare of livestock herders using these resources. This is to be accomplished while maintaining or enhancing rangeland productivity over time. The first phase was designed as a \$45.0 million project. At the national level, activities include the infrastructural development of the National Range Agency (NRA) and the development of a B.Sc. degree program in range management under the Somali National University. Activities on the range include resource analysis, groundwater development, animal health, soil and water conservation, forestry and range management. It was initially envisioned that some 15 to 20 expatriate advisors would be assigned to the project to assist the Somali staff in carrying out project implementation activities.

Since the project is a large and complex development activity and funding is being shared by five donor agencies, activities are divided as follows: (1) International Development Agency, facility development; (2) International Fund For Agricultural Development, administration and management assistance to NRA and non-formal training; (3) World Food Program, food-for-work; (4) German Technical Assistance, animal health and forestry; and (5) USAID, rangeland resources analysis, groundwater development, soil and water conservation, range management and formal training.

The project area covers three regions - Hiran, Galgudud and Mudug or about 149,000 square kilometers. This represents between 25 to 30 percent of the rangeland of Somalia. Population is estimated to be around 550,000 of which around 400,000 are estimated to be directly involved in livestock production. Livestock numbers during the dry season were estimated as follows by a project funded survey in 1979 -- (1) Goats, 4,828,000, (2) Sheep, 1,503,000, (3) cattle, 233,000 and camels 314,000. During the wet season of the same year goat and sheep numbers almost doubled, camels increased three times and cattle increased 67 per cent. Rainfall is erratic and ranges from 50 mm to 200mm annually.

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II. Project As Proposed In Project Paper

A. Project Purpose

The project is designed to assist the Government in: (1) improving rangeland and livestock productivity through the introduction of improved range management practices, livestock water supplies and improved veterinary services; (2) gaining the confidence and cooperation of the pastoralists by establishing a dialogue with them through non-formal training; and (3) improving NRA's ability to implement range development by training of staff at all levels and by providing technical assistance.

B. The Project

USAID funded technical and financial assistance will be provided over a six year period in the following areas: A resource inventory will be carried out by two aerial photographic surveys, one during the wet season and the other during the dry season. The survey will provide the basis for identifying land use systems in terms of geology, soils and vegetation as well as information on human population and habitation, domestic animals, water points, wild animals by species and cropping activities.

A range ground survey will be conducted based on the resource inventory above, by a ground survey team consisting of two project funded range ecologists. The survey will: (1) verify and validate the resource inventory, (2) establish range condition guides and standards, (3) identify areas of high erodibility and areas suitable for village, town, famine and range grazing reserves, especially those suitable for stockwater development, and (4) locate access tracks. Following the survey a range monitoring unit will be established to record the condition of the range vegetation as a basis for management planning.

In order to overcome the lack of basic information on the rangeland resources of Somalia and to develop a research program on the basis of information provided by the aerial and groundwater surveys the project will provide eight and one half person years of professional services, equipment, staff housing and vehicles to establish 92 range reference areas in various

ecological zones. Plant species will be identified and chemical analysis performed on them. Trials will be conducted to determine the effects of grazing at various intensities, firing and bush-clearing.

Based on the information and experiences resulting from the studies and range trails 30 per cent of the rangelands of the project will be put under controlled grazing through the formation of surveyed, monitored and guarded grazing reserves. A grazing association will be formed for each reserve. Stock watering facilities are to be developed where necessary. These associations will be trained to take over responsibility for the reserves under the supervision and direction of the NRA field staff after a period of approximately 10 years.

A soil and water conservationist and a cooperative advisor are to be project funded. The former is to conduct soil conservation and water spreading trials in three locations. The latter is to assist in the establishment of experimental grazing cooperatives in the same three locations. They will concentrate on the collective buying and marketing of livestock and the improvement of living conditions through the provision of health and education services.

The formal training component of the project is to develop a botany and range management department in Afgoi in the Faculty of Agriculture of the National University of Somalia. The project is to provide one professor and two lecturers, educational materials and staff housing to support the new department and the adjacent Livestock and Range School.

Participant training will be provided for both the range management and formal training aspects of the project.

C. Beneficiaries

The primary beneficiaries of the project are the livestock owners and their families who use the grazing, browsing and water resources of the Central Rangelands area. The number of people involved will number about 400,000. Additionally employment will be created in NRA for about 830 people and in the veterinary field service 80 people. The project will also create employment for a total of 4,700 person years of unskilled labor in project related works.

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III. Project Performance To Date

A. USAID Funded Activities

Project activities over the years have included most of the elements of the original project proposal (Table 1). However, there has been a modest shift of emphasis. The formal training component has been significantly strengthened. Commodities provided are about 60 percent of what was planned. The major change that has occurred is the shifting of rangeland activities from the entire area of the three regions of the CRDP to one district each in the three regions. It will be necessary to extend project long-term technical assistance, no new funding required, two years to compensate for delays in getting the project started and subsequent implementation delays.

The CRDP project began officially August, 1979. USAID Funded activities began the latter part of 1981 almost one and one half years later. Soon after implementation began, it became obvious that the CRDP area was too large. The NRA field staff was ill prepared to work without a considerable amount of supervision from counterparts and coordination of the various project components over such a vast area was difficult. Further aggravating the situation was the difficulty of moving within the CRDP area due to poor roads, constant fuel shortages and sometimes security reasons. To alleviate these constraints three districts, one each in each of the three CRDP regions, were selected in which project activities were to be concentrated.

However, security proved to be a serious problem since the selected districts were adjacent to the Somalia - Ethiopia border. Three other districts were subsequently selected, two of which front on the Indian Ocean and the third centrally located. Since this action was taken, the work that is district oriented, the three range ecologists and the soil and water conservationist work, have been proceeding at a satisfactory rate. In a second phase project activities would move progressively from district to district at an accelerated pace as expertise is acquired by the NRA staff and activities become institutionalized.

The range work thus far performed includes all activities that were originally planned with the exception of developing pilot cooperatives at several of the water spreading sites. It was decided to forgo this activity and the cooperative advisor

position was filled with a Sociologist. Range trials and research activities were transferred to the Formal Training component of the project. All grazing reserves that have been established or are planned for the future have or will have range condition monitoring sites to assist in their management. However, a system for monitoring range conditions of the entire project area has yet to be developed and put into place.

The resource inventory of the central rangelands has been completed. Range analysis surveys have been completed for Hobbio, Coel Dhere and eastern Bulo Berte Districts. These include range site mapping, documentation of vegetation composition and structure and range condition classification and for Hobbio District forage productivity. Forage productivity surveys have also been started in Coel Dhere and Bulo Berte Districts. A final report has been completed for one district and interim reports on another one and a half districts.

A floristic key has been prepared for the identification of grasses and a vegetative key 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 Latin and Somali names and palatability ratings, has been prepared. Methods for classifying range conditions have been developed and tested.

The concept of range reserves was changed from narrowly specific in terms of number, area and type to a more flexible interpretation that allows the nature of the reserve to reflect existing ecological and sociological realities. Instead of a scatter of reserves over 30 percent of the central rangelands each district is to be fully covered by reserves. Each reserve will have a range management plan and a local grazing association organized for its implementation. Range management plans have been prepared and are under implementation on about 10 percent of the area of the priority districts and are under discussion by the local range and livestock associations on another 20 percent of the area. The beginnings of a meteorological recording system has been established. Fifteen counterparts have been trained.

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Under the soil and water component dug outs for surface seasonal stockwater supplies have been dug at 17 sites and 11 existing shallow wells have been improved - - cement lips and aprons and stock water troughs. Wind was found to be the major cause of soil erosion throughout much of the central rangelands. Thus this component increased its emphasis on sand dune stabilization and developing village shelter belts. Nine village shelterbelts have been planted and plans prepared for another six. Cement lined berkedes have been constructed to supply water for eight of the shelterbelts. Four tree nurseries have been established. To date these nurseries have produced 38,000 tree seedlings for shelterbelt, experimental trials and village plantings. Sand dunes have been stabilized at three sites and plans drawn up for stabilizing a further twelve. 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 including seven counterparts, eleven technicians and six heavy equipment operators.

Groundwater development activities in the CRDP area were funded under the Comprehensive Groundwater Development Project (649-0104) being implemented by the Water Development Authority (WDA). The WDA drills the wells with their project supplied technical assistance and drilling rigs. Using commodities (engines, pumps, well casings and screens) supplied by the CRDP, the WDA then fully develops these wells. Nineteen wells have been drilled, seven of which have been successful. The remaining were either dry or the water too saline. Generally, the Grazing Reserves in the three priority districts now have fairly adequate livestock water supplies. A more equalized distribution of boreholes is either ecologically or politically undesirable, technically infeasible (no water or saline water) or unnecessary because of adequate though smaller existing water supplies. Experience has shown that sometimes there are more appropriate ways of providing watering points than boreholes. Because of the seasonal nature of some of the alternative sources of water they are useful tools for managing the use of grazing and browsing resources. To fulfill their contractual quota the Comprehensive Groundwater Development Project has begun drilling outside the three priority districts at sites mutually agreed upon by the water users, the CRDP range ecologists and the WDA. When the Comprehensive Groundwater Development Project terminates the Summer of 1986, well drilling activities in the CRDP area will continue under the WDA.

The formal training component of the project as originally designed included two range management lecturers for the Livestock and Range School that was to be established at the Afgoi Secondary Agricultural Training Center and a professor for the range program at the Faculty of Agriculture (FOA) of the Somalia National University. Only one of the lecture positions was filled for a period of two years rather than the two positions for a total of eight person years. Because of inadequate classroom space, the courses were taught only two hours per week. This occurred over the two year period of the lecturer's assignment.

It was then decided to concentrate on strengthening the Botany and Range Management Department of the FOA to provide the level of training and research capabilities that was subsequently felt was required by the CRDP and the NRA to adequately meet their present and future staffing requirements. A ten course curriculum was developed to be taught in the last two years of a four year Bachelor's Degree program. To implement this program and to conduct the project planned research that was transferred from the Range Management component, a staff of four professors was proposed, and are now all on board. The necessary physical plant is either in place or is under construction. Range research studies are under way and some have been completed. Thirteen students have graduated and another fourteen will graduate this year.

Twenty-two student years of participant training (five students) was programmed for USAID funded activities of the project. The NRA used the entire amount early in the project leaving none for the Formal Training Component. To subsequently staff the Botany and Range Department additional funding was allocated to the participant training program for one Ph.D. and six M.S. degrees in U.S. institutions. All seven of these students are currently in the United States.

B. Other donor Funded Activities:

A non-formal education component consisting of 18 professional and field extensionists and three audio-visual technicians has been developed. Four staff members have received post graduate training from project funds. Dialogue between project components has been successfully established and a great deal of local cooperation and support for project activities obtained. Surveys within the priority districts include (1) livestock seasonal herding patterns and herd movement

rationale, (2) traditional grazing area boundaries, (3) local priorities for type and location of water development, (4) livestock numbers, livestock owners and pastoral leaders, (5) basic household composition and (6) agriopastoralism.

A procedure for forming range and livestock associations (RLA) has been developed. Potential RLA's have been identified throughout the entire area of the three priority districts. Six RLA's, two from each district, have been organized. Two now have three years experience and two others one year experience in carrying out a simple system of rest rotational grazing within their traditional use area. The location of water points was found to be a very sensitive issue. Consequently an intensive survey and consultation procedure was developed and instituted to precede and accompany all forms of water development.

Construction of the veterinary physical facilities including a central veterinary investigation laboratory, two field laboratories, staff housing and logistic support units have been completed. National veterinary staff have been recruited and trained. A survey of livestock diseases is underway and a method of disease monitoring is being developed.

The forestry component has established several tree nurseries with annual capacities ranging from 60,000 to 150,000 seedlings. Village wood lots and forestry plantations (30 to 150 hectares each) at each of the three regional headquarters have been planted. Staff housing and offices have been constructed and training programs conducted for NRA staff.

Construction of the national, regional and district headquarters facilities for the NRA has been completed. This includes the NRA office building and vehicle maintenance workshop in Mogadishu and three regional and 13 district headquarters containing offices and living quarters.

TABLE 1
PROJECT PAPER TARGETS, ACCOMPLISHMENTS AND ACTIVITIES And
TARGETS FOR REMAINING THREE YEARS

<u>Components</u>	<u>Unit</u>	<u>PP</u> <u>Targets</u>	<u>Completed</u>	<u>To Do</u> <u>in last 3 years</u>
<u>Range Development</u>				
1. Resource Inventory	Aerial survey	1	1	1
2. Ground Survey	Districts	13	3(1)	3
3. Establish Range Condition Guides & Standards	-	-	In process	Update
4. Identify Areas For High Erodibility, Grazing Reserves, Stock Water Development	-	-	In process	Continue
5. Range Monitoring Sites				
a. Fenced	Sites	92	4	6
b. Not Fenced	Sites	284	10	10
6. Access Tracks	Km	1,000	50	200
7. Demarcation Lines	Km	10,200	500	500
8. Forage Identificn.	-	Proposed	In process	Continue
9. Forage Analysis	-	-	-	To do
10. Grazing Reserves	% of CRDP	30	3	20
a. Range Reserve	No.	20	6	12
b. Famine Reserves(2)	No.	12	0	0
c. Village Reserves(3)	No.	45	0	0
11. Grazing Asso.(RLA)	No.	20	6	12

- (1) These three districts are 26% of total CRDP area
(2) Famine reserves deemed to be inappropriate.
(3) No distinction made between range and village reserves.

TABLE 1 (Cont.)

	<u>Unit</u>	<u>PP</u> <u>Targets</u>	<u>Completed</u>	<u>To do</u> <u>in last 3 Years</u>	
B. <u>Water Development</u>					
1.	Boreholes or Reservoirs	No.	32	19(7 good)	6 good
		No.	4	0	0
2.	Dugouts(4)	No.	0	17	60
3.	Wells New or Rehabilitated(4)	No.	0	11	50
C. <u>Soil and Water Conservation</u>					
1.	Demonstrations				
a.	Water Spreading	Site	3	1	2
b.	Grazing Cooperatives	Site	3	0	0
2.	Village Shelter Belts	No.	0	9	20
3.	Berkhods	No.	0	8	20
4.	Nurseries	No.	0	4	3
5.	Dune Stabilization	Site	0	3	12
D. <u>Animal Husbandry</u>					
1.	Livestock Survey	Survey	0	1	5
2.	Herd Monitoring	Herds	0	0	6
E. <u>Formal Training</u>					
1.	FOA Range Service Bldg.	% Completed	-	60	40
2.	Long term Training				
a.	Range Comp.				
(1)	U.S.A.	Std. Years	0	20	9
(2)	Third Country	Std. Years	0	0	8
b.	FOA Comp.				
(1)	U.S.A.	Std Years	20	6.5	16
(2)	FOA B.Sc. Degrees	No.	0	13	40
3.	Short term Training				
a.	In-Country	No.	0	25	75
b.	U.S.A.	No.	0	1	6
c.	Third Country	No.	0	3	10
F. <u>On-the-job Training</u>					
		No.	0	40	20
G. <u>Publications</u>					
		No.	0	37	26

(4) These are activities of the soil and water conservation project component.

IV. Project Activities Yet To Be Implemented

A. Monitoring

Rangeland condition monitoring as perceived by the PP consists of two aspects. One is the establishment of monitoring sites on each of the grazing reserves to assist in their management. Monitoring sites have been and are being established on these grazing reserves as planned. The other aspect is to monitor conditions of the entire project area. A system for doing this is in the formative stages and will be in place by the proposed project completion date of September 30, 1989.

Region level monitoring will consist of collecting and analysing data on a detailed basis on widely scattered relatively small areas and on a less detailed basis over relatively large geographic areas. The principal components of the program will be the following:

(1) NOAA AVHRR satellite data will be used to monitor vegetation vigor and cover. AVHRR prints will be obtained from the Regional Remote Sensing Center in Nairobi on a regular basis. Maps of different classes of greenness and cover will be compiled on a twice a month basis. The retrieval, analysis and presentation of cover and greenness data from all previous satellite prints for the Central Rangelands will be done under contract with a private firm. This information will be used to develop a data base for detecting conditions that significantly deviate from the annual or seasonal norms.

Ground verification of AVHRR data will be carried out at a few selected sites representative of major ecological zones. Ocular estimates of vegetation phenology, plant vigor, height (grasses), and cover will be made and related to AVHRR data. This information will aid NOAA in their program of drought prediction as well as allow extrapolation of actual ground conditions beyond the ground verification sites.

(2) Climatic data will be collected throughout the CRDP area. Automatic meteorological recording stations will be established at most of the NRA Field Headquarter facilities. Additionally, storage rain gauges will be placed at other important sites where they can be properly maintained, guarded and recorded.

(3) Some of the information collected by the NRA extension services will be incorporated into the monitoring activity. This will include information on (a) any unusual concentration or distribution of livestock, (b) sudden increase in the sales or slaughter of livestock, (c) variation of livestock prices and the relative prices of livestock and cereals and (d) the rate at which people are leaving the area.

(4) All of the above data will be analysed and integrated into a relatively simple predictive model. Continuous monitoring of the various coefficients will permit quick determination of rangeland conditions and the possible occurrence of drought or famine as well as short-term trends.

For monitoring long-term trends the following measures will be taken:

(1) New LANDSAT thematic imagery of the entire central rangelands will be compared with 1960 aerial photographs to determine the trends of land use, sand dune formation and areas of highly eroded land.

(2) The resource inventory that was conducted in 1979 will be repeated for the entire central rangelands.

(3) Aerial photographs will be taken of Coel Dhere District. The photographs will be used to estimate the area under crops, the area devoted to agropastoral activities, privately fenced grazing enclosures, sand dunes and other highly eroded areas. Comparisons will be made with the 1960 aerial photographs to determine what, if any, changes have taken place.

B. Animal Husbandry

The CRDP PP provided for improving the management of the central rangelands. The primary users of these resources are the pastoralists and their livestock. Other than improved veterinary services no provisions were included in the project to assist the pastoralists in improving their animal husbandry practices.

To overcome this deficiency, an animal husbandry component has been incorporated into the project with the recent replacement of the team leader with an animal husbandry specialist. Initially efforts of the NRA Animal Husbandry Unit will be directed at surveys to determine current pastoralists animal husbandry practices and to identify production constraints. Subsequently, a program will be designed to assist the livestock producers overcome these problem areas.

The NRA Extension Service in cooperation with the Animal Husbandry Unit will implement this producer training program.

C. Rural Sociology

The CRDP PP planned to help the nomads to gradually establish a management system that would lead to self-sufficiency in forage and stockwater in the project area. However, the knowledge on the central rangelands pastoral complex is very limited. One social scientist was brought in a year after the project started to help broaden the knowledge base on the central rangelands occupants. This social scientist provided some useful guidance to CRDP staff during his short tenure. However, today the project is still faced with many of the same sociological constraints to project implementation it had in the beginning as identified on page 17 and page 18 of the PP.

To overcome these sociological constraints rural sociologists will be programmed for up to two person years during the last two years of the project. It is envisioned that part of the sociological component will be addressed by Somali sociologists. This will be a time saving and beneficial element of the project if appropriate Somali sociologists can be identified and brought on to the CRDP staff. Providing that one or more Somali sociologists are hired the expatriate rural sociologist position can be a TBY activity. The visits will be spread over the remaining time of the project to guide the rural sociological activities of data collection and analysis and training.

The rural sociologists will have to establish rapport with local inhabitants to determine the various constraints to project implementation that pertain to the nomads' acceptance of project activities. They will also need to evaluate existing baseline data on the nomads' social organization. The rural sociologists should then set about adding to that information as necessary to help understand the central rangeland sedentary and nomadic occupants and their attitudes, decision making processes and their acceptance of the projects new ideas and changes. After analysis of this information, the rural sociologists will then work with CRDP staff on ways to overcome the sociological implementation constraints of the project. As the project moves into new districts the rural sociology component will be a key element in successful and timely implementation of project activities.

V. Rationale For Project Paper Supplement

The very large CRDP geographical area, difficult communication and travel and many project components requiring coordination made project implementation difficult. In addition, the NRA field staff was and is inadequately prepared to work on a relatively independent basis. Therefore, the high level of supervision required to keep field activities at a level intensive enough to be effective in all of the 13 project districts at the same time was not possible. To overcome these problems it was agreed by all parties involved to concentrate project activities to three priority districts, one each in each of the three regions comprising the project. The objective now is to complete the work in a district then move on to another district and so on until the entire project area has been covered. Much of this will have to be done at the initiative of NRA if there is no follow on project. With the project extension of about three years, the work in the first three priority districts will have been completed and activities begun in three additionally selected districts.

Activities incorporated into the original project design concentrated on improving the management of the range, providing formal training primarily directed at range management, upgrading the administration and technical competence of the NRA and improving the animal health delivery system. An animal husbandry component was not included. To overcome this deficiency the USAID funded activities team leader, who began his assignment in August 1985, is an animal husbandry specialist. He, working with his counterpart, will identify current herd management practices and make recommendations on ways to improve these practices in a way that will result in an increase in the offtake rate.

The Formal Training Component of the project has been significantly strengthened with emphasis on the establishment of the Botany and Range Management Department in the Faculty of Agriculture (FOA) of the National University of Somalia. The original PP proposed one professor for the FOA for 5.5 person years and two lecturers for the Livestock and Range School for a total of eight person years. One of the two lecturers was brought on board and the other lecture position was changed to range technician. The professor and lecturer developed curricula for their respective institutions.

The Livestock and Range School (LRS) was not yet constructed so the lecturer had to arrange for classroom space at the Secondary Agricultural Training Center. He was only able to arrange for classroom space two hours per week. After two years the position was terminated.

It was subsequently decided that the LRS would not be able to provide the level of training and research capability needed by the NRA. Thus, the decision was made to establish a botany and range management department within the FOA to train the 450 to 500 technical range people the NRA estimates that they will need to fully carry out their national mandate. The plan now is to provide three professors for a total of 14 person years instead of one person for 5.5 years. In addition to developing the course curriculum and teaching responsibilities the professors have also been assigned the range trials and research activities of the project. This action has resulted in an increase of five person years of technical assistance to the formal training component of the project. However, five person years had been budgeted for research under the range component. Thus, the strengthening of formal training has not increased the technical assistance requirements of the project but will significantly increase the quality of people trained in range management that will be available for employment with the NRA or elsewhere in the economy.

By the time project assistance terminates in September 1988 the Botany and Range Management Department will be fully staffed with Somalis who received post graduate degrees in the United States. Two trainees (masters degrees) will be returning in early 1988, and an additional five the middle of 1988 (one Ph.D. and four masters degrees).

VI. Economic Analysis Reworked

For the reasons expressed above it was necessary to concentrate project activities in only three of the 13 districts which come under the jurisdiction of the CRDP. This action, in effect, has reduced the geographic area to approximately 26 percent of the total area of the three regions. This, in turn, implies a reduction of beneficiaries from around 400,000 to about 105,000 and an equivalent percentage reduction in livestock numbers. Assuming that the project is successful and that project activities become institutionalized the entire rangelands area of the CRDP will eventually be under improved management. Thus, in the following economic analysis project returns assumptions are maintained. However, the benefit stream is here delayed an additional two years and is assumed to begin in year eight at a slower rate and full benefits are not to be realized until year 17. Actual costs incurred by the project through 1985 are used here. All other assumptions are maintained with the exception of livestock prices which have been adjusted upward slightly to reflect current price relationships.

In the original analysis the formal training component and trials and research costs are not included. It was felt that the benefits derived could not be quantified. So in this analysis the IRR has been calculated both with and without these components. Another real benefit not included in the original analysis nor in this one either is the increased output of milk and milk products which will accompany improved range, veterinary and animal husbandry practices.

The assumed annual offtake rate for small ruminants (sheep and goats), cattle and camels are 11.20, 3.74 and 3.00 percent respectively. These are probably on the low side. However, no empirical data exists on which to base an adjustment of these figures.

In the original analysis increased offtake, the only source of assumed project benefits, was derived in two ways. The range improvement component is assumed to result in an increase in the size of the herd. Small ruminants are assumed to increase in numbers by 910,000, cattle by 40,000 and camels by 60,000 resulting in an increase of 127,000 grazing livestock units. To this incremental herd the above offtake rates are applied. In the case of the veterinary component the offtake rates are assumed to increase to 13.26, 5.14 and 3.60 for small ruminants, cattle and camels respectively. These incremental

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offtake rates are then applied to about 16 percent of the wet season sheep and goat numbers (1.8 million), 69 percent of the cattle (269,000) and 33 percent of the camels (303,000). These assumptions are maintained in this analysis. However, if improved range management and animal husbandry practices are adopted by the pastoralists offtake rates should increase not only from the veterinary services but from these activities as well.

Improved practices should enhance animal nutrition thereby increasing fertility rates, decreasing death rates and making possible the marketing of younger animals. However, no attempt has been made to estimate to what extent this is likely to occur. Also inherent in this analysis is the assumption that future land use activities without the project will not result in the degradation of the environment and a decline of productivity.

The original analysis in the PP yielded an IRR of 15 percent (Table 2). When recalculating the cash flow as described above the IRR declines to 12 percent (Table 3). If the formal training component and trials and research costs are included, which was not done in the original analysis, the IRR declines to 10 percent, benefits are assumed to begin in the eighth year and project payback will occur in year 18 (Table 4). Although this is a long period of time it is not atypical of a project of this type which involves research, technological change and biological processes.

While the IRR, as recalculated, is very likely below the opportunity cost of capital in Somalia, to terminate funding at this time would certainly be false economy. The project, although belatedly, is achieving results. Range surveys are being completed, management plans for the grazing reserves have been and are being prepared and Range and Livestock Associations are being organized. Under the Soil and Water Conservation activity shelter belts have been planted, surface water facilities developed, water spreading projects completed and dune stabilization measures taken. The formal training component is well on its way to achieving its objectives. The Botany and Range Management Department has been brought into existence, a comprehensive curriculum has been developed and is now being taught, range research and trials are being conducted and students have been graduated with B.Sc. degrees. The participant trainees will be returning from the United States in mid 1988 to take over teaching and research responsibilities. If expenditures to date were treated as sunk costs returns on the remaining programmed funds would indeed be impressive.

TABLE 2

CRDP PP CASH FLOW, 1979 PRICES 1/

Year	Costs	Revenue	Cash Flow	Accumlated Cash Flow
	(----- So. Sh. 1,000,000-----)			
1	20.2	0	-20.2	-20.2
2	32.4	0	-32.4	-52.6
3	34.3	0	-34.3	-86.9
4	35.0	0	-35.0	-121.9
5	25.1	0	-25.1	-147.0
6	17.4	17.6	0.2	-146.8
7	16.6	20.9	4.3	-142.5
8	16.6	25.9	9.3	-133.2
9	16.6	33.1	16.5	-116.7
10	16.6	44.3	27.7	-89.0
11	16.6	51.5	34.9	-54.1
12	16.6	60.4	43.8	-10.3
13	16.6	63.3	46.7	36.4 2/
14	16.6	65.7	49.1	85.5
15	16.6	67.3	50.7	136.2
16	16.6	67.3	50.7	186.9
17-29	15.1	67.3	52.2	865.5
30	15.1	464.7 3/	449.6	1,315.1
TOTAL	541.8	1,856.9	1,315.1	

IRR = 14.91

1/ Livestock per head price assumptions: Sheep and goats So.Sh. 316, Cattle So.Sh. 1,868, Camels So.Sh. 2,700.

2/ Break-even occurs in year 13.

3/ Includes the residual value of the incremental herd.

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TABLE 3

CRDP ADJUSTED PP CASH FLOW, 1979 PRICES 1/

<u>Year</u>	<u>Costs</u> 2/	<u>Revenue</u>	<u>Cash Flow</u>	<u>Accumulated Cash Flow</u>
	(-----)	So. Sh.	1,000,000	(-----)
1	8.4	0	- 8.4	- 8.4
2	10.7	0	-10.7	- 19.1
3	38.2	0	-38.2	- 57.3
4	35.4	0	-35.4	- 92.7
5	34.2	0	-34.2	-126.9
6	21.6	0	-21.6	-148.5
7	38.9	0	-38.9	-187.4
8	45.7	11.7	-34.0	-221.4
9	58.2	15.0	-43.2	-264.6
10	12.7	20.9	8.2	-256.4
11	12.7	32.4	19.7	-236.7
12	12.7	45.8	33.1	-203.6
13	12.7	56.3	43.6	-160.0
14	12.7	63.6	50.9	-109.1
15	12.7	66.7	54.0	-55.1
16	12.7	69.1	56.4	1.3 3/
17-29	12.7	70.7	58.0	755.3
30	12.7	567.1 4/	554.4	1,309.7
Total	558.0	1,867.7	1,309.7	

IRR = 11.58

1/ Livestock per head price assumptions: Sheep and Goats So.Sh. 325, Cattle So.Sh. 1,920, Camels So.Sh. 3,240.

2/ Actual project expenditures through 1985 were used though deflated to 1979 prices

3/ Break-even occurs in year 16.

4/ Includes the residual value of the incremental herd.

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TABLE 4

CRDP ADJUSTED CASH FLOW INCLUDING FORMAL TRAINING AND TRIALS AND RESEARCH,
1979 PRICES 1/.

Year	Costs <u>2</u>	Revenue	Cash Flow	Accumulated Cash Flow
	(-----So.Sh.1,000,000-----)			
1	8.4	0	-8.4	-8.4
2	11.1	0	-11.1	-19.5
3	40.2	0	-40.2	-59.7
4	38.4	0	-38.4	-98.1
5	36.6	0	-36.6	-134.7
6	31.2	0	-31.2	-165.9
7	48.8	0	-48.8	-214.7
8	51.4	11.7	-39.7	-254.4
9	62.7	15.0	-47.7	-302.1
10	16.0	20.9	4.9	-297.2
11	16.0	32.4	16.4	-280.8
12	16.0	45.8	29.8	-251.0
13	16.0	56.3	40.3	-210.7
14	16.0	63.6	47.6	-163.1
15	16.0	66.7	50.7	-112.4
16	16.0	69.1	53.1	-59.3
17-29	16.0	70.7	54.7	651.8 <u>3/</u>
30	16.0	567.1 <u>4/</u>	551.1	1,202.9
Total	664.8	1,867.7	1,202.9	

IRR = 10.15

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- 1/ Livestock per head price assumptions: Sheeps and Goats So.Sh. 325, Cattle So.Sh. 1,920, Camels So.Sh. 3,240.
 - 2/ Actual project expenditures through 1985 were used though deflated to 1979 prices.
 - 3/ Break-even occurs in year 18.
 - 4/ Includes the residual value of the incremental herd.

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VII. Planned Versus Required Inputs

A. Technical Assistance

The technical assistance provided to the Range Management Component of the project through June, 1986 will be about 23.5 person years (PY). This compares to 25 PY proposed in the PP. A two year extension of long-term technical assistance to the project will require an additional 14 PY to be allocated as follows: One animal husbandry specialist for two years, two range ecologist for two years and one other for one year, one soil and water conservationist for two years, and one rural sociologist for a total of 10 person months. With the exception of the sociologist, these are currently filled positions. However, the animal husbandry position has been filled only since August, 1985.

The three ecologist positions and the soil and water conservationist position are being extended to more fully institutionalize these activities in the NRA and extend their activities beyond the current priority districts. Counterpart assignments and field training have been less than satisfactory. Many participant trainees, both B.Sc. and M.Sc. degrees, are still in the United States. There also are new areas of work which will have to be undertaken. This includes establishing a project wide range condition monitoring system, determining the significance and effects of agro pastoralist activities and the reasons for and methods of preventing the gully erosion which has become prevalent in some areas of the CRDP area in recent years.

While activities for improving the management of range resources is well represented, improved livestock management practices were not included in the PP. To overcome this deficiency, an animal husbandry specialist was added. The intention is to survey livestock owners to define animal husbandry practices now in use, identify production constraints and propose improved management practices for extension to livestock owners.

Although not provided for in the CRDP Project Paper, a rural sociologist will be programmed on a TDY basis during the next two years of the project. The purpose is to better understand the sociological implications of proposed changes in range management and animal husbandry practices. The sociological findings will provide a basis for modifying these recommendations in a manner that is consistent with the needs and desires of project beneficiaries as well as their ability to participate in project activities.

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Originally, under the Formal Training Component of the Project 13.5 PY of technical assistance was to be provided to the Faculty of Agriculture and the Livestock and Range School - 5.5 PY to the FOA and 8.0 PY to the LRS. Because of the lack of appropriate facilities at the LRS only 2 PY were provided there. It was subsequently decided to create a Botany and Range Management Department with the FOA. At the same time it was decided to transfer the range and trials research work to the Formal Training Component.

Four lecturers are now on board teaching a ten course curriculum. The intention now is to extend three of these positions through September of 1988. This will permit a several month overlap with returning participants. Also during this extension of the project, three participant trainees will be in Somalia doing their thesis research the first half of 1987 and five in the latter half. The guidance that will be necessary will require a significant amount of time if the program is to produce meaningful research training.

These actions, strengthening the FOA, incorporating the range trials and research work and extending the project, will require a total of 18.0 PY which is equivalent to that proposed in the original PP.

B. Participant Training

The CRDP Project Paper proposed 22 student years (SY) of long-term participant training. This was all used early on in the project by the Range Management component of the Project to fund B.Sc. degrees. Since then it was decided to develop a B.Sc. degree program in range management in the FOA under the Formal Training Component of the project. To adequately staff the Botany and Range Management Department seven participant trainees, one Ph.D candidate and six M.Sc. degree candidates were sent to United States universities. They will all be returning to Somalia during 1987 to do their thesis research and return with their degrees the Summer of 1988.

During the extension of the project, the Range Component is proposing an additional nine student years of non-thesis M.Sc. degrees- four in range management and two in soil and water conservation. This all totals up to 46 SY versus 22 SY originally planned. In addition, short courses, primarily in-country, will be given in areas such as extension methodology, administration and management, soil and water conservation and remote sensing.

C. Commodities

Only about 65 per cent of the commodities proposed in the PP have been purchased by the CRDP (Table 5). Less than half of the heavy earth moving equipment was purchased and has proven to be adequate for project purposes. Only 30 per cent of the pumps, pump engines and spare parts have been purchased. The number of wells required to supply adequate stock water supplies in the grazing reserves has proven to be less than envisioned. Of the ten pump sets purchased, five have been installed.

Four 4 wheel drive pick up trucks were programmed and purchased. Two were assigned to Range Management and two to Formal Training. These vehicles have gone beyond their useful lives and are to be replaced by eight vehicles, four each for each of the two components. Other commodities to be purchased that were not included in the PP are office equipment, computers and related soft and hardware, equipment for range monitoring activities and aerial photograph and satellite imagery materials.

D. Construction

All dollar funded construction has been completed and there are no plans for such activities in the future. Construction of the range science building at the FOA using local currency is about 60 percent completed. This facility will be available for occupancy within the coming year.

E. Local Costs (So. Sh.)

The dollar equivalent of Somali Shillings converted at the official exchange rate when the counterpart funds were deposited into the CRDP account was 2.4 million dollars through 1985. The proposed budget for 1986 through 1989 is for 533.9 million shillings (Table 7). Thus the GSDR's agreed upon

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contribution to the project of five million dollars equivalent will very likely be met even considering a continued devaluation of the shilling.

Of the total shillings required in 1986 about 80 percent is to support USAID funded activities. In subsequent years this declines to 71 percent.

F. Project Extension Funding Requirements

Funding requirements for the extension of the project will be 4.85 million dollars (Table 8). This is equivalent to what will be available to the project July 1, 1986 following a 500,000 dollar deobligation. The source of the funds required for extending the project and covering the additional costs of technical assistance, participant training and commodities are other budgetary line items (Table 9). Operating and capital costs totaling almost 3.0 million dollars have been and are being funded with counterpart funds and the Comprehensive Groundwater Development Project respectively. Inflation and contingency line items of the PP provide an additional 4.0 million dollars.

The current proposed technical assistance requirements for the life of the project is 59.5 person years which is a 37 percent increase over what was budgeted in the PP. The cost of this technical assistance will be around 9.3 million dollars compared to the proposed 5.0 million. The PP budget was based on a cost assumption of 100,000 dollars per person per year for resident technicians and 6,000 dollars per person per month for consultants. This is considerably less than the costs experienced by the project.

The participant training that has occurred and is now being proposed is about 160 percent greater than that of the PP. The twenty student years (SY) originally proposed for post-graduate training for FOA staff was used by the range component for bachelors degrees early on. Thus another 32 SY have been programmed for post-graduate training in the United States -- 22 for the FOA and 9 SY of non thesis master's degrees for the Range Component. The total funds required for participant training will be about 1.2 million dollars or an increase of 230 percent reflecting the larger number of people trained and to be trained and higher costs per degree.

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Four four-wheel drive blazers or equivalent and associated spare parts will be purchased to replace the pick-up trucks supplied earlier and are now reaching the end of their useful life. The faculty of Agriculture plans to purchase up to seven vehicles with local currency. These vehicles will be used to support the research and field trials of seven returning participant professor counterparts..

The long term technical assistance will terminate September 30, 1988 but the PACD will be extended through June 30, 1989 to cover participant training costs, both long-term and local courses, and consultancies.

Table 5

USAID FUNDED
TECHNICAL ASSISTANCE

	<u>PP</u>	<u>Actual and PP</u>
	<u>(---Person Years---</u>	<u>Supplement</u>
A. <u>Range Development</u>		(3) 14.0
1. Range Survey Ecologists	(2) 3.0	-
2. Range Monitoring Ecologists	(2) 4.0	-
B. <u>Range Studies and Trials</u>		
1)		
1. Range Investigations		
a. Range Ecologists	(1) 2.5	0
b. Senior Range Technician	(1) 2.5	0
2. Taxonomist	(1) 3.5	(1) 3.5
3. Soil and Water Conservation	(1) 2.0	(1) 6.0
4. Cooperative Advisor	(1) 2.0	0
5. Rural Sociologist	0	(2) 3.0
C. <u>NRA Headquarters</u>		
1. Technical Directors		
a. Range and Environment	(1) 4.0	(1) 4.0
b. Water Service	(1) 2.0	(1) 1.0
c. Animal Husbandry	0	(1) 3.0
2)		
2. Hydrogeologist	(1) 2.0	0
2)		
3. Drilling Foreman	(1) 2.5	0
D. <u>Formal Training</u>		
1. Faculty of Agriculture Lecturers	(1) 5.5	(4) 16.0
2. Livestock and Range School Lecturers	(2) 8.0	(1) 2.0
E. <u>Total</u>	43.5	52.5

Note:

Numbers in parenthesis refer to the number of technical positions proposed and/or provided.

- 1) These activities were transferred to the Formal Training Component
- 2) These activities were transferred to the Comprehensive Groundwater Development Project (649-0104)

TABLE 6
PP PROPOSED COMMODITY PURCHASES

	<u>Proposed</u>		<u>Actually Supplied</u> (No.)
	<u>Quantity</u> (No.)	<u>Cost</u> (US\$1,000)	
Bulldozers	5	457	2
Motorgraders	2	146	1
Truck, Maintenance With Cable Rig	1	130	
Truck, Fuel Tanker	1	32	1
Truck, 4-wheel Drive (5 ton)	2	45	
Truck, 4-wheel Drive (7 ton)	1	23	
Pick-up Truck, 4-Wheel Drive	4	49	4
Vans, Parts	2	70	1
Tractors	3	45	
Tractor Equipment (Disk, Plow, Land Leveller, Trailer	3 each	32	
Pumps	35	183	10
Pump Engines	35	111	10
Spare Parts	-	373	Yes
Well Casings	-	123	Yes
Screens, Cement, Chemicals	-	23	
Radios and Generators	4	10	12
Tools, Camping and Survey Equipment	-	530	Yes
Lab and Scientific Equipment	-	62	
Trailers	3	24	3
Procurement Fees	-	176	
Total	-	2,644	-

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Table 7

CRDP Somali Shilling Budget By component

	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
	(-----So.Sh. 1,000-----)			
<u>Range Component</u>				
Salaries & Support	25,600	30,822	36,986	44,383
Transportation	21,010	25,212	30,255	36,805
Building maintenance and Utilities	4,126	4,746	5,457	6,058
Commodities & Supplies	12,554	14,908	15,979	17,804
Construction	6,510	7,812	7,823	8,250
Total	69,800	83,500	96,500	113,300
USAID Supported	47,300	48,800	57,600	68,600
<u>Formal Training Comp. 1)</u>				
Salaries & Support	2,190	3,675	5,085	7,377
Transportation	3,850	11,923	18,782	16,670
Building maintenance and Utilities	1,427	1,568	1,724	1,896
Commodities & Supplies	2,243	4,184	2,721	2,178
Construction	32,625	28,591	10,995	10,994
Total	42,435	49,941	39,307	39,115
<u>Grand Total</u>	112,235	133,441	135,807	152,415
Accumulative	112,235	245,676	381,483	533,898
USAID Supported				
Total	89,735	98,741	96,907	107,715

1) This component is 100 percent supported by USAID.

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Table 8

Allocation of Remaining Funds for three year Extension
of Project - July 1, 1986 through June 30, 1989

	<u>1986/87</u>	<u>1987/88</u>	<u>1988/89</u>	<u>Total</u>
	(-----US \$1,000-----)			
<u>Range Component</u>				
Technical Assistance(1)	1,331	1,179	60	2,570
Resident Technicians(2)	(921)	(769)	(55)	(1,745)
Consultants (1)	(240)	(240)	0	(480)
FSU	(170)	(170)	(5)	(345)
Participant Training(1)	200	100	0	300
Commodities	500	0	0	500
Range Resource Survey	(250)	0	0	(250)
Remote Sensing Equip.	(100)	0	0	(100)
Retrival and Analysis of Remote Sensed Data	(50)	0	0	(50)
Computers (2) and Related Hard and Software	(15)	0	0	(15)
Tractor with Backhoe and Front Loader	(30)	0	0	(30)
Animal Handling and Marketing Equipment	(25)	0	0	(25)
Polyethylene Pipe	(30)	0	0	(30)
Contingency and Evaluation	100	100	0	200
Total	2,131	1,379	60	3,570

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Table 8 Cont.

	<u>1986/87</u>	<u>1987/88</u>	<u>1988/89</u>	<u>Total</u>
	(-----US \$1,000-----)			
<u>Formal Training Component</u>				
Technical Assistance(1)	441	444	100	985
Resident Professors(3)	(361)	(364)	(80)	(805)
FSU	(80)	(80)	(20)	(180)
Commodities	200	0	0	200
Office Furniture	(15)	0	0	(15)
Textbooks & Teaching Aids	(20)	0	0	(20)
Library Furniture	(28)	0	0	(28)
Library Books	(28)	0	0	(28)
Scientific Journals	(14)	0	0	(14)
Field Equipment	(8)	0	0	(8)
Lab & Herbarium Equip and Supplies	(30)	0	0	(30)
Data Analysis Equipment	(18)	0	0	(18)
House Furniture and Appliances	(39)	0	0	(39)
Contingency and Evaluation	48	47	0	95
Total	689	491	100	1,280
<u>Grand Total</u>	<u>2,820</u>	<u>1,870</u>	<u>160</u>	<u>4,850</u>

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- (1) Consultants and training will continue up to June 1989.
 - (2) Five technicians the first year, four the second and one the last three months.
 - (3) Three professors the entire period.

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Table 9

olution of Proposed Expenditure of Project Funds

	PP & PROAG	PIL # 18	PIL # 23	PIL # 25	PIL # 27
	(-----US \$1,000-----)				
Technical Assistance	5,025	7,115	7,746	8,000	9,031
Commodities	2,644	3,608	4,152	4,152	3,952
Operating Costs (1)	2,006	2,479	1,079	952	0
Capital (2)	923	1,259	703	703	0
Participant Training	354	483	1,086	1,086	1,166
Inflation	3,209	0	106	51	0
Contingency and Evaluation	783	0	72	0	295
Formal Training (3)	-	-	(1,756)	(1,629)	(2,240)
Field Support Unit (4)	-	(258)	(258)	(512)	(1,037)
Total	14,944	14,944	14,944	14,944	14,444(5)

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- (1) Operating costs were and are being funded with counterpart funds. The \$252,000 in the last column is for the upcoming project evaluation and other costs.
- (2) These funds were for the purpose of well drilling. However, well drilling costs were funded through the comprehensive Ground Water Development Project.
- (3) Included in other line items.
- (4) Included in technical assistance.
- (5) Five hundred thousand dollars was deobligated June 1986.

Table 10

CENTRAL RANGELAND DEVELOPMENT
PROJECT# 649-0108 METHODS OF IMPLEMENTATION AND FINANCE

<u>ELEMENT</u>	<u>METHOD OF IMPLEMENTATION</u>	<u>METHOD OF FINANCE</u>	<u>OBLIGATED AMOUNT</u>
1. Tech. Assist.	AID Direct, Host Country Contract.	Direct Reimbursement	<u>7,994</u>
2. Commodities	PIO/C's (Purchase Orders/Supply Cont.)	Bank L/Comm, Direct L/Comm, Direct Reimbursement	<u>3,952</u>
3. Training	PIO/P's	Payment procedures as specified in <u>HB 10</u>	<u>1,166</u>
4. F.S.U.	PILs (Purchase order/ Supply Contract) Direct AID Contracts *	Direct Reimbursment, Direct L/Comm, and Bank L/Comm. *	<u>1,037</u>
5. *Evaluation/Contingency	AID Direct Contract	Direct Reimbursement	<u>295</u>
TOTAL			14,444 =====

*
 Process PIO/T to let a Direct Contract to a firm to conduct the evaluation. The Direct Reimbursement method of payment will be used.