PD-AAR-743

Africare

"L'Amélioration de la qualité de la vie en Afrique rurale en développant les ressources hydrauliques, la production agricole, et les services de santé.

Africare Tchad
B.P. 689
N'Djamena
Tel. 30-25

Siege Administratif
1601 Conn. Ave., N.W.
Washington, DC 20009
Etats-Unis

SEP 1985
RECEIVED

COOPERATIVE AGREEMENT N° 677-0502-A-4013-00

PROJECT N° 698-0502-4a

PROJECT TITLE : CHAD REFUGEE REHABILITATION PROJECT

REPORTING PERIOD : MAY 1, 1985 TO JULY 31,1985

ACTIVITY PROGRESS REPORT N° 6

QUARTERLY REPORT ON THE ABECHE RURAL DEVELOPMENT PROJECT

REPORT SUBMITTED BY : TYRONE GASTON, COUNTRY REPRESENTATIVE
AFRICARE/CHAD

REPORT SUBMITTED ON SEPTEMBER 6,1985

cc : Office of Development Information and Utilisation
Bureau for Develoment Support
Agency for International Development
Washington, D.C. 20523

I - GENERAL REFERENCE

- Agency : Africare
- Activity Title : Chad Refuge Rehabilitation Project
- Country/Area of Activity Chad/Abeche
- Activity n°
  - . AID Project N° 698-0502. 4a
  - . Africare Project n° 2204
- AID Grant Agreement N° : Cooperation Grant N° 677-0502-A 00-4013-00
- Total Value of Activity : $ 2,850,000
- Period Covered By Last Report : February 1,1985-April 30,1985
- Period Covered By This Report : May 1,1985 - July 31,1985
- Report Prepared By:

Tyrone Gaston :Country Representative

Bill Stringfellow : Seed Distribution Specialist and Logistics Supervisor

Harouna Dia : Hydraulic Engineer

Manuela Huso : Forester/Ecologist

- Report Submitted on : September 6,1985

TABLE OF CONTENTS

Section		Heading	Page
I	-	General Reference	2
II	-	Forestry Activities	4
	A	Status of Project on May 1,1985	4
	B	Progress During This Period	4
	C	Analysis of Constraints/Problems and Recommendations Provided	7-8
	D	Status of Project on July 31,1985	8-9
	E	Projected Activities For Coming Reporting Period	8-9
	F	Meeting Held, site visits,and Specific Activities of U.S. hire Staff	10
	G	Apendix I	11
		Apendix II	12
		Apendix III	13
		Apendix IV	14
III	-	Hydrology Activities	15
	A	Status of Project on May 1,1985	
	B	Progress During this period	
	C	Analysis of Contraints/Problems and Recommendations Provided	16
	D	Summary of Project Status on July 31, 1985	18-19
	E	Projected Activities For Coming Reporting Period	20
	F	Meeting Held, Site visits	
	G	Estimated Cost/Benefit Analysis	21
	H	Sougour Spring design	
	I	Typical Dam design	

IV	-	Seed Program/Administrative/Logistics	26
	A	Status of Project on May 1, 1985	26
	B	Progress During this Period	26
	C	Analysis of Constraints/Problems and Recommendations Provided	28
	D	Summary of Project Status on July 31, 1985	28
	E	Project Activities for Coming Reporting Period	29
	F	Meeting Held, Site visits, Specific Activities of Africare U.S. hire staff	29
V	Financial		

II - FORESTRY

A. STATUS OF THE PROJECT ON MAY 1,1985

Seventy-five per cent of the 40,000 pots at the Africare nursery had been seeded at the start of this period. The remaining 25% was comprised of fast-growing species scheduled for seeding in early May. Routine watering, weeding and maintenance activities had been instituted. The direct seeding of a live fence using local thorny species was partially completed. Deepening of the larger well was still under way to assure an adequate water supply for the seedlings.

An agreement was reached with the Water and Forest Service (W & FS) on a joint project to rehabilitate the gum plantations at Moura, Facha and Abougoudam. Food-For-Work projects had begun at the three sites to enclose each area in a thorn fence (made from the dead gum trees removed from the plantation) and to build small water catchments at the base of each tree to retain runoff. The W & FS was provided with 10,000 plastic pots in which to grow the Acacia senegal seedlings, which were to be used to replace the dead trees in the plantations.

A forestry extension program was begun in late April in conjunction with the W &FS . The Africare agent and the cantonnement Chief of the W & FS began visiting key villages in each of the cantons to give talks on agroforestry, windbreaks, live fencing and village fuelwood plantations.

In late April, the forester/ecologist and assistant forester departed for the U.S. to attend a conference on arid lands forestry, followed by three weeks of annual leave. The project logistician came from N'Djamena to supervise the current project activities during her absence and to plan the seed distribution program.

B. PROGRESS AND ACCOMPLISHMENTS DURING THE PRESENT REPORTING PERIOD

Forestry activities during this period were concentrated in four areas : Africare nursery seedling production, village extension, village project implementation, and collaborative work with the Water and Forest Service.

1 Nursery Activities-Pot seeding begun in the last quarter was completed in May with the sowing of 3,000 Prosopis juliflora and 4,000 Parkinsonia acculeata. Due to poor germination for some species including Acacia nilotica, P. acculeata and Zizyphus mauritiana, empty pots had to be resown in early June to assure the availability of at least 35,000 trees for this season.

Transport of the seedlings to the planting sites was begun in early July (see Appendix II for numbers and destinations). Seeds of several exotic species including Lucaena leucocephala and Prosopis spp. were ordered from a seed house in the U.S. to supply our needs for planting in the wadis during the dry season and for next year.

2. Village extension-The collaborative extension effort of Africare and the W & FS extension agents was carried out through mid-May. It was then discontinued during the forester's absence when the month of Ramadan began. The program was reinitiated upon the forester's return in late May but has remained sporadic due to the onset of heavy rains and the unavailability of the extension agents occupied with prior political responsibilities.

The extension program concentrated on such non-classic forestry concepts as windbreaks, live fencing and A.albida planting as well as village woodlots. Agents from the National Office of Rural Development who had attended the workshop on agroforestry cosponsored by their agency and Africare in April were very effective in generating interest in these techniques in villages which Africare would otherwise have been unable to reach. The extension work has also included the development of experimental fields in collaboration with the ONDR. These are areas where forestry techniques are combined with agricultural pratices as showpieces to the public.

3. Village forestry projectsimplementation - The table in Appendix III outlines the proposed activities and estimated needs by species for each village. It is a tentative schedule drawn up at the beginning of the season which will be modified as the season progresses depending on individual village needs, physical constraints and ultimate seedling supplies.

During the month of July, approximately 14,000 seedlings had been delivered to five project sites briefly described below:

Abougoudam - Balanites aegyptica, P. acculeata and Zizyphus spp. were distributed by the W & FS agent and ONDR agent to local farmers to be planted in live fences and in their compounds.

Badiné and Banatil- A. albida were given to 21 farmers to plant in their sorghum fields. Balanites aegyptica and Zizyphus spp. were distributed to be planted as live fence rows between the fields and along the main thoroughfares. The ONDR experimental field near Badiné was planted with a windbreak composed of B. aegyptica and Zizyphus spp.

Batouma - Acacia nilotica and P. acculeata were planted around the hafir to reinforce the live fence planted last year.

Kiledji - Approximately 2,000 Prosopis juliflora were planted in a village woodlot. Other P. juliflora and Zizyphus spp. were planted as live fences around garden plots. Ten farmers were chosen to take part in the A. albida project.

Sougour - Eight rows of windbreaks 400m long and approximately 50 m apart were planted in the area near the spring. This will serve to eventually reduce the drifting of sand around the spring and protect the gardens. Ten farmers will participate in the Acacia albida project here as well.

Although it was planned to work at Atillo where Africare anticipates building a small dam, the people did not express much interest in forestry at the extension meetings, so this site was abandoned for this year. The other villages we have contacted and worked with have expressed such readiness and eagerness to plant trees that it seemed more important to concentrate on them and work with the more reticent villages at a later date.

It has been impossible to visit the Lucaena leucocephala plantation since the beginning of July so it is unknown what its condition is. Some of the L. leucocephala planted at the W & FS Office in Abéché have recently developed what appears to be a fungal infection which enters the heart wood through the leaves and branches . First the leaves wither and dry and then the entire tree dies. The source and eventual remedy of this infection are being investigated.

4 . Collaborative work with the Water and Forest Service - An agreement was reached with the W & FS concerning our collaborative efforts. The W & FS will be responsible for " classic " forestry activities such as large government sponsored plantations in and around the town of Abéché. Africare will be responsible for " non-classical " forestry such as windbreaks and livefencing in rural villages. Africare will continue to support the W & FS with materials for their nursery, transport of their trees and payments to plantation guards. The gum plantations will be primarily under W & FS management but Africare will provide transport to and from the sites.

This year, it was expected that 90 ha of gum plantations would be improved. Unfortunately, when the project was launched, an accurate estimate of the effects of continued drought on these trees had not been made. In late May the forester returned from vacation to find that approximately 80 % of the existing gum trees were dead.

Earlier, Africare had provided 10,000 seedling pots in which the W &FS had agreed to produce Acacia senegal seedlings to be used to replace the dead trees in the plantations. However, probably due to extreme water stress last year, gum acacia seeds were not available this spring in large quantities and the W & FS was able to produce only about 1,000 seedlings, far below the number needed. Alternative uses for the areas were proposed and discussed but it was decided that they should remain as gum plantations and that perhaps next year we will be able to produce the seedlings to reestablish them.

5. Miscellaneous activities - Survival rates of several of last year's planting efforts are listed in Appendix III. Given the very low rainfall and the late planting dates a 70 % average survival rate seems exceptional . This would indicate that , except under particular conditions i.e. near wadis etc.. indigenous species are the most appropriate for reforestation in this area in spite of their generally slow growth rate.

Repairs to the W & FS office building were completed this quarter. Shelving will be installed early next quarter.

C. ANALYSIS OF CONSTRAINTS AND PROBLEMS AND RECOMMENDATIONS PROVIDED

The problems encountered this quarter were, for the most part unpredictable. They included unforseen circumtances which took up much of the time of vital personnel, climatic and physical conditions which made work impossible for various periods of time, and accidents which left some of our vehicles partially debilitated or completely out of commission.

From mid-May to mid-June all work was very much slowed down by the observance of Ramadan. People were neither able to eat nor drink all day in the middle of the hot season and consequently their production was very low. Plans to do extension work through June were suspended in May during the forester's absence, with the beginning of Ramadan. When the period of Ramadan was concluded in mid-June many of the government officials were then occupied with preparations for a visit by the president of the country, so normal activities were put on hold for a time. Even the villagers were occupied with preparations making it difficult to set specific schedules to hold extension meetings or begin planting.

The president arrived on July 8.With his arrival came the first in a series of heavy rains (see Appendix IV) which made travel to many of the forestry sites impossible for days at a time.

On July 3, the dump truck twisted one of its hydraulic rods putting it out of commission for several days while it was being repaired. Repairs were unable to be completed here in Abéché and since neither the hydrology nor forestry program could afford to lose the use of the vehicle at this time,the truck's hydraulic system was simply closed off and the truck is being used as a flat bed (without the dump) until parts arrive and futher repairs can be made. On July 16, the forester's truck was put out of commission as well when it took water into its engine and chipped a cylinder. A vital piece in the tree distribution program was thus lost at a very inopportune time. The distribution of 40,000 trees was then dependent on one Toyota pick-up and the dump truck. Delivery of trees had to be done intermittently between rains and between repairs.

Plans for extension work and the distribution of trees were based on accesibility of sites similar to the past year and did not take into account the visit from the head of state which disrupted the work schedule. Next year more emphasis will be placed on satellite nurseries, reducing the transport problems during the rainy season.

Because seed was not available, A.senegal seedlings were not produced in large enough quantities to merit replanting in the gum plantations. Work at these sites was suspended until perhaps next year when a concrete plan can be developed and carried out.

D . STATUS OF THE PROJECT ON JULY 31, 1985

By the end of the period it was evident that an exceptional rainy season was in progress. Heavy July rains were causing delays in seedling transport. However , the negative effects of planting delays should be offset by the improved availibilty of water at the planting sites. As of July 31 nearly 14,000 seedlings had been delivered for planting. About 21,000 seedlings remained in the nursery awaiting transport during the first half of August.Six villages had already received trees for windbreaks, live fencing, firewood plantations and soil-improving A.albida plantings.

The responsibilities of Africare and the Water and Forest Service were more clearly defined. Africare will concern itself with more agroforestry related activities in rural areas and the W & FS will concentrate on the more " classic" greenbelt and street plantings in and around Abeche.The W & FS will also take the responsibility of gum plantation management. Africare will continue to provide supplies and transport in support of W & FS forestry activities.

E . PROJECTED ACTIVITIES FOR COMING REPORTING PERIOD

It is expected that the distribution of all trees will be completed by the end of August.Follow-up activities to assure proper care and protection of the trees will continue throughout the next reporting period.The wood consumption survey will be initiated.

Repairs will be made to the existing nursery and an irrigation system will be installed when the water pumps arrive.

F . MEETING HELD, SITE VISITS, SPECIFIC ACTIVITIES OF US DIRECT HIRE STAFF

April	28	- Symposium on Establishment and productivity of Tree
May	2	- Plantations in Semi - Arid Regions in Corpus Christie, Texas.
May	3-25	- Annual leave
May	31	- Visit Moura gum plantation site - devastated. Almost all gum trees dead. Stopped work.
June	1	- ONHV - ask for recommendations on work on nursery well.
June	3	- W & FS - discuss further collaboration and support.
June	4	- Sougour - visit hydrology springbox site and examine forestry potentials.
June	10	- Abougoudam - visit gum plantation. Most trees dead; stopped work
June	11	- W & SF - discuss alternative uses for gum plantation areas. Alternatives not possible.
June	12	- Facha - visit gum plantation. Most trees dead; stopped work Batouma - visit live fence site. Trees on windward side very stressed Kiledji - people have direct - seeded Zizyphus sp. and Balanites sp. Discussed village plantation.
June	18	- W&FS - Discuss survival rates of last year's plantations. Also repeat need to make concrete plans for this year's season. W & FS very busy with other governmental activities, thus not available.
June	20	- Batouma- assess survival rate of last year's planting.
June	23	- Sougour - further develop forestry planting for this site: wind-breaks, live fencing and A. albida.
June	24	- Moura - visit Lucaena plantation.
June	25	- Doulbarit - extension talk on forestry; observe seed distribution .
June	26	- Kiledji - talk to town leaders about potentials of Prosopis juliflora and show them last year's plantings. Expressed great interest.
June	26	- ONDR - discuss possibilities of using agroforestry techniques in demonstration fields. Will do so in Abougoudam.
June	28	- Abougoudam - visit demonstration field to determine appropriate agroforestry techniques-windbreaks primarily.
June	29	- W & FS - Discuss cooperative forestry projects in and around Abeche. Unable to begin due to other commitments in preparation for President's visit.

July 2 - Action Commitee Meeting -discuss seed distribution program.

July 4 - W & FS -discuss making diguettes in plantation; not available for discussion about other projects due to preparations for President's visit.

Kiledji - finalize A. albida project with them and set date for planting Prosopis.

July 5 - Kiledji - transport trees; also visited Kiledji dam - broken, and Tiré dam - no water yet.

July 8 - President arrived - parade and speeches.

July 9 - Ambassador Moffat and John Woods of USAID paid visit to ask about project - took them to see Dougouri.

July 10 - Kiledji - ready to plant 2,000 more trees.

July 11 - Batouma - will do 1 ha experimental field with countour dikes.

July 12 - Abougoudam - visit experimental field with ONDR

Tyrone Gaston arrived to discuss project.

Batouma - selected site, began contour dikes.

July 15 - Abougoudam - began transporting trees. Planting delayed by distribution of peanut seeds.

Batouma contour dikes laid out.

July 16 - Batouma-brought and planted millet seed in experimental field.

July 18 - Abougoudam - begin laying out wind break.

July 19 - Banatil - extension meeting; planted half of windbreak and began A.albida plantings.

July 21 - National Tree Week - organised by W & FS . Local authorities each planted a tree.

July 22 - Kiledji - begin planting Prosopis in woodlot.

July 23 - Sougour - transport trees for windbreak.

Atillo - set up date for extension meeting.

July 24 - Sougour - began planting windbreak.

July 25 - Tiré - extension meeting - want to do 5 ha plantation.

Kiledji - all trees planted, need more.

July 27 - Atillo - extension meeting; people not very open to ideas of reforestation.

July 29 - Badiné - extension meeting ; want 3,000 trees for live fencing this year.

July 30 - Sougour - 1/4 of windbreak planted.

July 31 - Banatil - finish windbreak in experimental field.

Tiré - gave A. nilotica seeds to be planted in live fence.

Batouma - dam full; contour dikes working well.

APPENDIX I
SEEDLINGS SHIPPED AS OF 31 JULY 1985
BY SPECIES & SITE

Species / Site	Acacia albida	Acacia nilotica	Balanites aegyptica	Parkinsonia aculeata	Prosopis juliflora	Ziziphus mauritiana	Ziziphus spina-christi
Abougoudam	-	-	500	110	-	-	260
Badine	764	-	750	-	-	-	1400
Banatil	850	-	657	-	-	920	240
Kiledji	722	-	-	-	2580	120	-
Sougour	325	-	741	493	-	650	1065
Batouma	-	360	-	350	-	-	-
Totals	2661	360	2648	953	2580	1690	2965

APPENDIX II ESTIMATED NEEDS BY SPECIES AND ACTIVITY

Site / Activity	Plantation	Windbreak	Live-fence	Acacia albida	Fruit Trees	Gum arabic
Abeche			Street 600 B.a.			
Abougoudam	800 B.a.		2000 Z			1000 A.s.
Atillo						
Batouma	500 B.a.		500 P.a. 500 A.r.	1000 A.a. ?		
Banatil	800 P.j.	5k 3400 A/Z/B 1250 P.a.	1000 Z 1000 B	1000 A.a.		
Facha			500 P.a. 500 A.r/A.r.	1000 A.a.		
Kiledji	5ha 2000 P.j.	3k 2040 A/Z/B 750 P.a.	200 P.j.	1000A.a.		
N'Gatar		2k 1360 A/Z/B 500 P.a.				
Sougour		3k 2040A/Z/B 750 P.a.	3k A.r/A.n.	1000 A.a. ?		
Tiré	500 Z 500 A.a. 500 A.n.500 B.a.			1000 A.a.		
Were		1k 680 A/Z/B 250 P.a.		1000 A.a. ?		
Aboundouroua		3k 2040 A/Z/B 750 P.a.				
Sabar	50 Lucaena		1000 Z.			
Badine			1000 Z.			
TOTAL	2800 P.j.	11,560 A/Z/B 4,250 P.a.	200 P.j.			

A.a. =Acacia albida
A.r.= Acacia radiana
A.n.= Acacia nilotica
A.s.= Acacia senegal
B.a.= Balanites aegyptica
P.a.= Parkinsonia aculeata
P.j.= Prosopis juliflora
Z.= Zizyphus sp.

APPENDIX III

SURVIVAL (%) BY SPECIES AND SITE

	Acacia albida	*Acacia nilotica*	*Acacia radianna*	*Acacia senegal*	*Azadirachta indica*	*Balanites aegyptica*	*Parkinsonia aculeata*	*Prosopis juliflora*	*Ziziphus Mauritiana*	*Ziziphus spina-christi*	*Overall survival*
Abéché Green Belt	89	95	98	87	44	64	NP	77	54	100	71
Abougoudam Plantation	80	100	NP	NP	NP	NP	94	NP	100	NP	92
Batouma Live Fence	93	95	95	53	NP	NP	97	NP	100	100	71

NP = Not Planted

Date	June 1955 Office	June 1955 Residence	June 1955 Average	July 1955 Office	July 1955 Residence	July 1955 Average
1	-	-		-	-	-
2	-	-		-	-	-
3	-	-		-	-	-
4	-	-		5.2	3.7	4.45
5	-	-		-	-	-
6				31.9	22.5	27.2
7	-	-		19.8	20.5	20.15
8	-	-		37.0	36.0	36.5
9	-	-		0.5	2.6	1.55
10	-	-		0.2	0.7	0.45
11	-	-		3.9	8.4	6.15
12	-	-		-	-	-
13	-	-		-	-	-
14	-	-		-	-	-
15	18.5	12.5	15.5	1.0	3,6	2.3
16	-	-		7.8	7,5	7.65
17	-	-		0.5	-	0.25
18	0.3	-	0.15	10.1	1,0	5.55
19	-	-		-	-	-
20	-	-		1.4	-	0.7
21	-	-		-	-	-
22	5.5	7.0	6.25	-	-	-
23	-	1.2	0.6	1.8	4,0	2.9
24	-	-		-	-	-
25	-	-		-	-	-
26	-	-		27.5	31,0	29.25
27	-	-		-	0,2	0.1
28	-	-		-	-	-
29	-	-		-	-	-
30	0.4	-	0.2	6.8	-	3.4
31	-	-		7.6	7.5	7.55
Total	24.7	20.7	22.7	163.0	149.2	156.1

Note : Rainfall is measured at two locations in Abeche, the Africare Office and Residence.

III - HYDROLOGY ACTIVITIES

A - STATUS OF THE PROJECT ON MAY 1, 1985

Two reservoir construction sites, Dougouri and Tiré, remained open with 550 people working on a Food For Work (FFW) basis. The work included deepening the water catchment basins and building up the embankment.

B - PROGRESS DURING THIS PERIOD

In addition to Dougouri and Tiré two other sites have opened since June : the spring box design/construction at Sougour-Mandourma and the Atilo dam design.

1 - DOUGOURI

Considering the perviousness of the soil, the proximity of the reservoir to urban Abéché, and the possible health hazards of a large reservoir, I suggested, upon my arrival, that it would be better to focus on protecting what had already been constructed before the rainy season began. Instead of continue deepening the basin at Dougouri, it was necessary to strengthen the embankment and more importantly, construct a natural spillway to overflow excess water.

An earthen dam cannot withstand overtopping; thus this work has been oriented toward preventing this type of incident. The spillways's construction, a fusible dike designed to wash out in heavy rains thus protecting the main dike, is now completed. At present, Dougouri reservoir contains 34,000 m^3 of water which is its capacity. The spillway has operated successfully after each rain. The surrounding aquifer is recharged and the water table of a nearby well has increased from 7.5 meters to 0.4 meters from the surface. The workforce has been reduced to 100 persons who repair and maintain the embankment and spillways. Many cracks appear each rain caused by compaction defaults.

2 - TIRE

Tiré is a small pond with a capacity of 3000 cubic meters. At this site the basin was also deepened and a natural spillway set up. The basin is presently full and the spillway is operating successfully. Peasants in charge of the maintenance are not paid by Food For Work. The construction has been finished since July 15.

3 - SOUGOUR - MANDOURMA

We located the spring under two meters of sand which required its removal before development/construction could began. This consisted of estimating water flow, designing and constructing springbox's collecting, conveying and storage systems. The site has remained our most important one as it necessitates highly specialized work. Local villagers have participated in the project implementation since June. Conjointly, Africare ONDR and the villagers will use this spring to irrigate 0.5 hectares which will be used for vegetable gardening. Catchment systems for other springs found near the original one will be constructed to meet future water needs. The spring's discharge rate is estimated at 1 cubic meter per hour; however, since the beginning of the rainy season, the discharge rate has increased appreciably.

The spring box's conveying/collecting system is in progress.

4 - ATILO

This dam's design is in progress and topographic surveys are completed.

C - ANALYSIS OF CONTRAINTS, PROBLEMS AND RECOMMENDATIONS PROVIDED

1 - PROBLEM

While the goal of the Africare Abéché Integrated Rural Development Project was to assist the development of Agriculture in the region, only two of the eight projected water structures are relevant to Agricultural Development, which is, at present only a secondary activity of the project. Livestock and village water supply have remained the major activities (Dougouri, Tiré, Batouma), while the priority in the Ouaddai is food production.

In addition, water retention structures for agriculture can always be used for livestock and village water supply; contrairly, Tiré, Dougouri, and Batouma cannot be used for agricultural production. Consequently the project should be re-focused toward water resource development for agriculture.

In the sahel and particularly in the Abéché region, fundamental changes are necessary in the production system to reduce the effects of the drought. Because of unpredictable rainfall, rainfed agriculture is totally out of the question.

Irrigated agriculture is the only way for the agricultural production system to adapt to periodic droughts. Small-scale irrigation systems with peasant participation in design and construction should be the scheme for agricultural production in the Ouaddaï. Moreover, waddis streams and surrounding areas are the only places that harvests can be obtained during years of drought.

Historically, when annual rainfall was 450 mm in pre drought years, abundant runoff was used to develop waddis drainage areas. Natural flooded irrigation would consequently arise as the waddis overbanked and flooded much of the land surrounding them. As the soil is mostly sandy loam or clay, the holding capacity enabled farmers to grow crops. With the greatly diminished rainfall, the waddis rarely overbank and the amount of flooded has decreased enormously. Many farmers have migrated due to their inability to cultivate crops on this land.

The objective of the small scale irrigation systems planned is to enable the waddis to reproduce the phenomenon which happened naturally in the past, i.e. the overflowing and flooding of peasants land using diversion dams and canal systems. Experience shows it is possible to produce two crops per year and to recharge the aquifer with these irrigation systems.

RECOMMENDATION:

The project should be re-oriented toward the improvement of agricultural production in the waddis through water resource development for agriculture. Discussions have been underway with USAID-CHAD concerning such a reorientation.

2 - PROBLEMS

There have been serious technical problems with the water structures constructed or rebuilt in the Abeche Integrated Rural Development Project.

Wéré dam, a masonry division structure for flood irrigation, constructed in 1984 failed in July, 1985. Equally, Batouma, an earthen dam constructed to divert a waddi to fill another reservoir, reconstructed this year also failed. Dougouri has fail each year since 1975; however, this year it has withstood rains of over 87 mm because of the recently constructed spillway and routine maintenance. Facha dam built by the UNDP in 1974 never worked; it failed with the first rain of that year. We decided not to rebuilt it.

The lessons from all these dam failures are:

a) - A dam is a structure which must be designed and constructed according to engineering requirements.(No designs nor construction requirements were provided for any of these dams).

b)- In the Ouaddai Region reinforced concrete diversion dams in the waddi channels are the only structures which can withstand the high water pressure resulting from the intensive runoff developed after almost every rain, and assure good flood irrigation.

RECOMMENDATION

Special measures must be taken to accelerate the project reorientation document, thereby enabling the purchase of the following equipment absolutely necessary for the construction of reinforced concrete dams for agricultural purposes:

1) 2 light vehicules (4 WD,)
2) 2 cistern trucks (capacity 6 m^3)
3) 2 concrete mixers (capacity 0,5 m^3)
4) 1 dumpTruck (10 ton)
5) Land surveying equipment (theodolite) and miscellaneous measuring tools.

3 - PROBLEM - The use of Food For Work (FFW) to implement the project has brought problems and concerns. While it is true that badly malnourished people cannot work, the Food For Work program has disassociated the peasants from any interest in the goals of the project, reducing them to the status of hired workers who have no ultimate responsability for what's going on. Peasants participate in the project not because they think it worthwhile them, but only to receive food.

Peasants are rational econmic agents who have to be masters of their own development. Our presence should help and assist them to reach their own goals. If not, the project will ultimately fail from lack of maintenance, interest, or because it had never been a priority for the peasants.

RECOMMENDATION

We should abandon the use of Food For Work and use " encouragement" as we did at the spring-box construction site, where peasants decided to participate because they perceive vegetable gardening important to them. After discussions and an exhange of views, the peasants agreed to work without pay; however, after several weeks of intensive work, the Work Food Program, following the visit of its Director to Sougour-Mandounma, decided to give food as an "encouragement" to the peasants. I think this sort of arrangement is a good example of how short-term assistance (food distribution) should be connected to long-term assistance(agricultural development).

D - SUMMARY OF PROJECT STATUS AS OF July 31, 1985

Maintenance and repair continue at the Dougouri dam, which is withstanding heavy rains with the help of the newly constructed natural spillways. The construction at the Tiré dam site is completed. The Sougour-Mandanma springs construction, our most important site, is on-going; the spring-box conveying system and reservoir are completed. The Atilo dam design is in progress.

It is hoped that the project problems and constraints mentionned above will be alleviated by the approval of the project reorientation document by USAID.

E - PROJECTED ACTIVITIES FOR THE COMING REPORTING PERIOD

1. Sougour - Mandourma : collecting and protection systems construction.
2. Routine maintenance and repair at Dougouri.
3. Complete Atilo dam design.
4. Site investigations and designs to be started for new dams.
5. Complete and submit project reorientation document; discussions with USAID/CHAD.
6. Submit project subactivity proposals to USAID/CHAD.

F - MEETINGS HELD, SITE VISITS

[Visits to project site intermittently throughout the quarter]

May 1985	Meeting with the two Africare Country Representatives concerning Project reorientation.
July 1985	Interview with Radio Tchad and Agence Tchad Presse concerning Africare water resource development activities. The interview was broadcast and appeared in the Tchad daily newspaper on July 13, 1985.
7/17	Meeting with USAID funding university team concerning water resource development issues in the Ouaddai.
7/19	Meeting with USAID Director and Project Officer concerning project reorientation.
7/20	Discussion of project status with the National Director of the OSDR, including project reorientation.

ESTIMATE OF COSTS AND BENEFITS

(EN FRANCS CFA)

COSTS

	YEAR 1
I - Dam Construction Cost	
Cement (32 tons a 140.000/ton)	4.480.000
Iron	1.575.000
Gravel (70 m^3 a 6000 CFA/m)	420.000
Wood (300 p a 8000 CFA/m)	2.400.000
Wire nails etc...	400.000
Labor (inc.15 % Contingency)	1.380.000
Bank protection	1.500.000
Cost construction 1 dam	12.155.000
Cost 8 dams	97.240.000
Contingency 10%	9.724.000
Total dam construction	106.964.000
II - Vehicles	
New equipment:	
2 light vehicles - pickup 4 WD	
2 Concrete mixers	
2 Water cisterns trucks	
8 ton truck 4 WD (transport gravel, sand)	
subtotal (est)	80.000.000
Spare parts, repair maintenance (25 %)	20.000.000
Spare parts (existing vehicles)	2.000.000
Repair ONDR vehicles	1.350.000
subtotal	103.350.000
contingencies 10%	1.035.000
Total vehicles	104.385.000
III - TRAVEL	
Carburant, oil lubricant new/old vehicles	13.000.000
Insurance + vehicles business expenses	3.000.000
Gas ONDR vehicles	900.000
Travel N'Djamena (supplies) 30 days x $ 50/day	675.000
Airplane 4 RT	800.000
Subtotal travel	18.375.000
contingencies 10 %	1.837.500
Total Travel	20.212.500

IV - MISCELLANEOUS EQUIPMENT

Topographical and surveying equipment	3.000.000
Office supplies and equipment misc.	675.000
Subtotal	3.675.000
Contingencies 10%	367.500
Total Misc. Equipment	4.042.500

V - PERSONNEL

Hyraulic engineer (salary + fringe travel)	13.500.000
2 asst. engineers (200.000 x 12 mo x 2)	4.800.000
3 drivers (light vehicles) 40 000 x 3x12 mo	1.440.000
5 drivers (heavy truck) 75.000 x 5x12mo	4.500.000
2 mechanics (60.000 x 2 x 12 mo)	1.440.000
2 dam construction monitor (2 x 100.00 x 12 mo)	2.400.000
2 survey - aides (30.000 x 2 x 12)	720.000
Contingencies 15 %	27.800.000
	4.170.000
Total Personnel	31.970.000

VI - GENERAL ADMINISTRATION COSTS

Freight on Commodity Purchases	2.250.000
Medicines	500.000
Tot.Gen.Admin.	2.750.000

VII - PRODUCTION COSTS

Seeds Berbere 5 kg/ha a 200 F/kg x 400 ha	400.000
onion/gombo 5 kg/ha a 155 f/kg x 8 ha	1.240
Total production	401.240

DIRECT COSTS:

Level I (travel, gas personnel, and gen, admin)	54,923.500
Level II(dam construction,vehicles,misc.equip.production)	215.792.740
Subtotal Direct costs	270.716.240

INDIRECT COSTS:

Travel, personnel, gen.administration (21.45 % of 54.923.500)	11,789,091
Dam construction,vehicles, misc.equip, production) (10% of 215,792,740)	23,089,823
Subtotal Indirect	34,878,914
Total Cost	305,593,150

BENEFITS

A. Drought Scenario

1. Yield - tons berbere 400 ha x 1 ton/ha	400 tons
Value a 200 f CFA/kg	80.000.000
2. Yield onions/gombo 8 ha x 15 ton/ha)	12 tons
Value a 155 CFA/kg	1.860.000
	81,860,000

[Net value of production foregone is zero when rainfall is below normal, i.e. no production without a dam]

B. NORMAL SCENARIO

1. Yield tons berbere 400 ha w 1.5 ton/ha		600 tons
Value a 200 F CFA/kg		120.000,000
2 Yield onions/gombo 8 ha x 2 tons/ha		16 tons
Value a 155 F CFA/kg		2.400.000
	*	122,480,000
Minus net value production foregone (i.e. production without dam)berbere		80.000.000
Net production minus net value production without dam		42.480.000

* In a year of average(or above) rainfall berbere yield are on average- 1 ton per hectare and onions/gombo yields approximately 1, 5 tons per hectare.

INTERNAL RATE OF RETURN AND. COST/BENEFIT ANALYSIS - HYDRAULIC PROGRAM

NORMAL SCENARIO

Year	Investment	Project Costs: Operation Maintenance	Production	Gross Costs	DF 12%	*Present Worth	Benefits: Tot.Value Production	Cash Flow	Present Worth
1	215,391,500	54,923,500	401,240	305,593,150	.893	272,894,680	42,480,000	-263,113,150	37,934,640
2	-	1,400,000	401,240	1,801,240	.797	1,435,588	42,480,000	+ 40,678,760	33,856,560
3	-	1,400,000	401,240	1,801,240	.712	1,282,483	42.480.000	+ 40,678,760	30,245,760
4	-	1,400,000	401,240	1,801,240	.636	1,145,589	42,480,000	+ 40,678,760	27,017,280
5-20		22,400,000	6,419,840	28,819,840	4.433	7,984,897	679.680.000	+650,860,160	188,313,840
				339,816,710		284,743,240	849,600,000		317,368,080

Benefit/Cost Ratios at 12% = $\frac{317,368,080}{284,743,240} = 1.1$

Rate of Return 13%

Drought Scenario

Year	Investment	Project Costs: Operation Maintenance	Production	Gross Costs	DF 12%	* Present Worth	Benefits: Total Value Production	Cash Flow	Present Worth
1	215,391,500	54,923,500	401,240	305,593,150	.893	272,894,680	81,860,000	- 223,733,15	73,100,980
2	-	1,400,000	401,240	1,801,240	.797	1,435,588	81.860.000	+ 80,058,760	65,242,420
3	-	1,400,000	401,240	1,801,240	.712	1,282,483	81,860,000	+ 80,058,760	58,284,320
4	-	1,400,000	401,240	1,801,240	.636	1,145,589	81,860,000	+ 80,058,760	52,062,960
5-20		22,400,000	6,419,840	28,819,840	4.433	7,984,897	1,309,760,000	1,280,940,200	362,885,380
						284,743,240			611,576,060

Rate of Return 25,8% Benefit- Cost Ratio at 12 % = $\frac{611,576,060}{284,743,240}$ = 2. 1

FARM BUDGET 1 HECTARE BERBERE AND VEGETABLE PRODUCTION (EN F CFA)

Production (1)	Year 1
1. Production - kg Berbere	1,500 kg
Value a 200 F CFA/kg	300,000
2 Vegetable gardening - Gombo + onion -(kg)	2 000 kg
Value a 220 F CFA/kg gombo + 90 f cfa/kg onion	310,000
(155 F CFA average) Total value production	610.000

Expenditures

Seed 5 kg per hectare a 200 f CFA/kg Berbere	1,000
5 kg per hectare a 155 f CFA/kg onion/gombo	775
Subtotal	1,775
Contingencies 10%	178
Totalexpenditures	1,953

Production expenditures minus expenditure 608,047 *

Family Labor

Man day's family labor	200 days
Value a 250 F CFA/day + 15% contingency	57,500
Net Benefits less family labor	550,547

With 25 % Rreduction in Yields

Value of Production	457,500
Production minus expenditures	455,547
Net benefits less family labor	398,047

(1)Berbere (petit mil) is planted during the rainy season; and vegetable gardening is a dry season activity.

* The net value of production foregone has not been subtracted. Depending on rainfall levels it varies between 0 in a drought year; up to 1 ton per hectare in a " normal" year. See Internal Rate of Return table .

IV - SEED PROGRAM/ADMINISTRATIVE/LOGISTICS

A STATUS OF PROJECT ON MAY 1, 1985

1. SEED PROGRAM

125 metric tons of seed were stored in Abéché.Distribution was planned in early June, as close to the " normal " beginning of the rainy season as possible so that the hard-pressed beneficiairies would not be tempted over a long period of time to consume the cereal.

It should be noted parenthetically that the 1985 seed distribution program in the Ouaddaï prefecture included the participation of eight donor agencies, as well as Coton Tchad and the concerned governmental services. Thus, Africare's contribution was only one component of a multi-faceted program that covered the entire five sub-prefectures of the Ouaddaï.

2. ADMINISTRATIVE

The new hydraulic engineer had just arrived in-country two days earlier and the new Country Representative was expected to arrive near the end of the month.

The logistics supervisor was filling in for the forester/ecologist, who was on vacation.

3. LOGISTICS

Two new vehicles,a pick-up truck and a dump truck, were expected to arrive soon. The other major outstanding order was for the two base-station radio units.

B. PROGRESS AND ACCOMPLISHMENTS DURING THE PRESENT REPORTING PERIOD

1. SEED PROGRAM

Approximately 106.8 MT of millet and upland sorghum were distributed in time for the planting season. This modest accomplishment was more than matched by mother nature : Abéché was enjoying a normal (i.e., pre-drought) rainy season.

The planning and implementation of the program, which was based by and large on the previous year's distribution scheme, were carried out conjointly by Africare and by the National Office for Rural Development (ONDR). Transport and logistical support were provided by the World Food Program (W.F.P.).

Unlike last year's seed distribution program, which covered the entire Ouaddaï prefecture and a portion of a neighboring one, this year's programed was limited to the Abéché Rural Sub-Prefecture. Only a small quantity of seed, some ten tons, was expedited beyond this zone and this was done to meet a shortfall of upland sorghum seed in the prefectorial distribution scheme.

The distribution plan was submitted beforehand to the Prefect of the Ouaddaï prefecture. The first distribution was made on June 15, somewhat later than originally planned because of the lack of available transport. The southernmost cantons were served first since they had far more people and were more likely recipients of the first rains.

After the departure of the seed distribution specialist from Abéché on June 21, the program was supervised by Mr. Kadi Kara of ONDR and the Africare Chief of Party, Ms. Huso.

2. ADMINISTRATIVE

After a brief, but thorough, orientation in N'Djamena from the then Country Representative (Mr. Gerber), the new hydraulic engineer, Mr. Dia joined his post of assignment in Abéché.

The new Country Representative, Mr. Gaston, made two trips to Abeche during the reporting period to get fully acquainted with the project.

The Africare/Abeche Office, located in a building belonging to the government, was expanded to better accomodate the staff.

3. LOGISTICS

The new pick-up truck was delivered in late May to the Abeche Office.

C. ANALYSIS OF CONSTRAINTS/PROBLEMS AND RECOMMANDATIONS PROVIDED

1. SEED PROGRAM

Distributions were hampered by a most unusual and all but forgotten problem : rain. Heavy rains in late June wreaked havoc with the area's roads, causing postponement of several distributions. Although the condition of the roads proved to be an almost insurmountable obstacle for the Ouaddaï's two southernmost sub-prefectures roads were, by and large, still manageable in the project's target area.

2. ADMINISTRATIVE

3. LOGISTICS

Delays in the delivery of the dump truck to N'Djamena prevented the expedition of the dump truck to Abeche on account of the condition of the road. Given, however, the difficulty of travelling on the roads in the Abeche area, this late arrival was more of a nuisance than a major hindrance to the project.

The radio units had still not arrived in N'Djamena, although - they were due any time.

D. SUMMARY OF PROJECT STATUS ON JULY 31, 1985

1. SEED PROGRAM

There remained 15 MT of bottomland sorghum ("berbéré") to be distributed during the next month, as well as some three tons of upland sorghum, which had been set aside for ONDR - sponsored distributions beyond the Abeche Rural Sub-Prefecture.

2. LOGISTICS

The major logistical matter revolved around the procurement of those items eventually deemed necessary to implement the reoriented hydrological program.

E. PROJECTED ACTIVITIES FOR THE COMING REPORTING PERIOD

1. SEED PROGRAM

The distribution of the remaining seed and the planning of the seed restitution program are the two planned activities.

2. ADMINISTRATIVE

The proposed amendment to the Cooperative Agreement between USAID and Africare, intended to reflect current realities and the reorientation of future activities will undoubtedly be the focus of much attention.

3. LOGISTICS

Timely procurement of the items to be ordered for the hydrological program will be important to its fruitful conclusion before the 1986 rainy season.

F. MEETINGS HELD, SITE VISITS, SPECIFIC ACTIVITIES OF U.S. HIRE STAFF

1. SEED PROGRAM

. The seed distribution specialist's sojourns in Abeche
- from April 29 to May 16, 1985;
- From May 25 to June 3, 1985;
- From June 10 to June 21, 1985.

2 - ADMINISTRATIVE , Meetings

- May 28	- Country Representative and Prefet of Ouaddaï discussed Abeche Rural Development Project.
- May 29	- Country Representative, ONDR Agent, Water and Forestry Service Inspector ans Sultant of the Ouaddaï discussed Africare working relationship.
- July 2	- Country Representative and Director ONDR discussed hydrology activities and how they may be incorporated in to agricultural development.
- July 13-15	- Country Representative visited governmental officials, W & FS, ONDR to discussed problem and progress in a the Abeche Rural Development Rural Development project.
- July 29	- Country Representative AID Representative, Agricultural Officer and Africare's hydrologist discussed re-orientation of hydraulic Activities
	- Country Representative, Director of ONDR and Africare's hydraulic Engineer discussed project re-orientation

SITE VISITS

- May 23	- Visited Maïlao Site
24	- N'Djamena Fara, Boutal-Fil
26	- Miskiné
- June 1	- Maïlao with Director of CAMAN

June 8	- Danouna, Abougouaye, Midekhiné
13	- Maïlao
19	- Maïlao
20	- Maïlao
26	- Maïlao
28	- N'Djamena Fara, Danouna, Abougouaye
July 13-15	- Abeche

SPECIAL ACTIVITIES

June 29	- Thomas Kraemer, Irrigation Engineer arrived to work on VGA, 2201.
July 10	- USAID Irrigation team visited Maïlao to study Africare system.
28	- Country Representative interview by PBS ' David Royal, Filmed Miskiné Project.
29	- Meet and discussed with cicely Tyrone development in Chad.