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OEF INTERNATIONAL  
Somalia N.W. Community Forestry Project  
CDA FORESTRY, PHASE I(OEF) 649-0112

INTERNAL END-OF-PROJECT EVALUATION

Consultant Report Submitted to OEF/Washington

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**LIST OF ANNEXES:**

Prepared by Scott J. Lewis, Project Forestry Specialist

- Annex 1 OEF Project Statistics  
Oct. 1, 1986 (2 pages)
- 2 Seedling Production Number (3 pages)
- 3 Seedling Production Cost Analysis (1 page)
- 4 Summary and Discussion of OEF field activities,  
November 23, 1986 (8 pages)
- 5 Photographs

## INTRODUCTION

This report has been prepared in response to an OEF/Consultant Agreement of October 24, 1986 requiring to carry out an internal "end of project" evaluation. It contains observations, conclusions and recommendations of the consultant in assessing particularly the following key items listed in the scope of work:

- realism of project's concept, goals and expectations,
- adequacies/shortfalls of implementation support and monitoring arrangements,
- technical and administrative collaboration of host-country organizations,
- beneficiaries,
- acceptance and subscription of project activities by local people,
- project impact on food-fodder-wood production.

The information presented here has been gathered during an 8 day visit to the project sites followed by a series of office visits in Mogadishu. During the assignment, the consultant — accompanied by a member of the OEF project staff — met with representatives of all partners of the project's cooperative agreement (AID and NRA) as well as the following, other organizations:

- SWDO Somali Women's Democratic Organization,
- UNDP, IBRD, FAO, British Forestry Project staff, Northwest Agricultural Development project,
- CARE/Somalia, TransCentury, Save the Children Foundation and AFRICARE,
- U.S. Embassy and REDSO/E.

The text is divided into six chapters and contains additional, detail information in five annexes.

Although beyond the scope of a usual end of project evaluation, a chapter on Future Prospects also is included in order to provide OEF and other interested parties with some background information on how, based on the project, additional activities could be planned to take advantage of the impressive progress that has been made in a relatively short period of time.

## EVALUATION SUMMARY

THE "CDA Forestry, Phase I (OEF)" project has been implemented under a Cooperative Agreement, between USAID/Somalia, the National Range Agency (NRA), and OEF, signed on December 17, 1984.

The original budget for the two-year duration compares to OEF's field estimate of actual expenditures and present commitments as follows:

	<u>Original Budget</u>	<u>Actually Spent/ Committed</u>
AID Contribution.	\$506,000	\$450,000
"Local currency from sale of PL-480 commodities and some government "in-kind" contributions	\$790,000*	\$196,000**
OEF	93,200	85,000
Total	<u>\$1,389,000</u>	<u>\$731,000</u>

\* 12 640 000 SSH @ 16

\*\* 18 300 000 SSH @ 89.6

The main issue in determining how much the project has actually cost thus far is selecting the correct \$/SSH exchange rate. The rate quoted in the document (\$1 = 16 SSH) more than doubled after the Agreement was signed (to 35) and has risen steadily and steeply since. At the time of the evaluation (end November 1986,) a "bank rate" of \$1 = 89.6 SSH was in effect, which is used above to convert the generated SSH back to dollars. Note that the "auction" rates presently vary between 120-140 SSH for 1 US\$.

The overall project's aim was to redress deforestation, provide work for refugees and their neighbors and to strengthen the institutional capacity of the NRA and the Somali Women's Democratic Organization (SWDO).

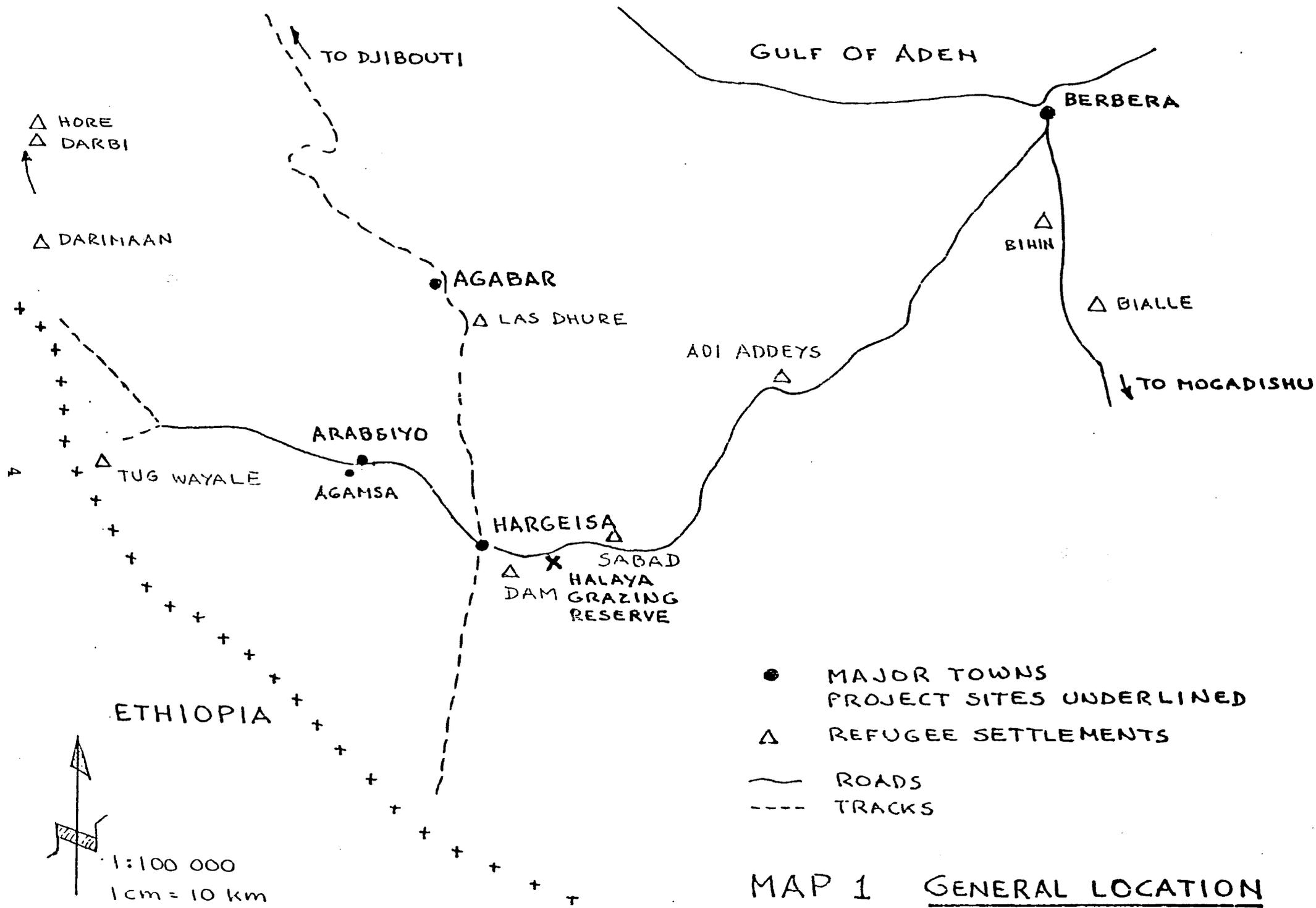
Specific objectives were defined in Annex 1 of the Cooperative Agreement and covered such items as 60,000 person-days of employment, at

least 3,744 beneficiaries, 240 ha plantations and woodlots and 80km of windbreaks (later changed to 140 ha plantations and woodlots and 180 km of windbreaks), 580,000 seedlings (later adjusted to 541,000) some resident/office construction and various unquantified training and extension activities. Location of the specific efforts are shown on maps 1 and 2.

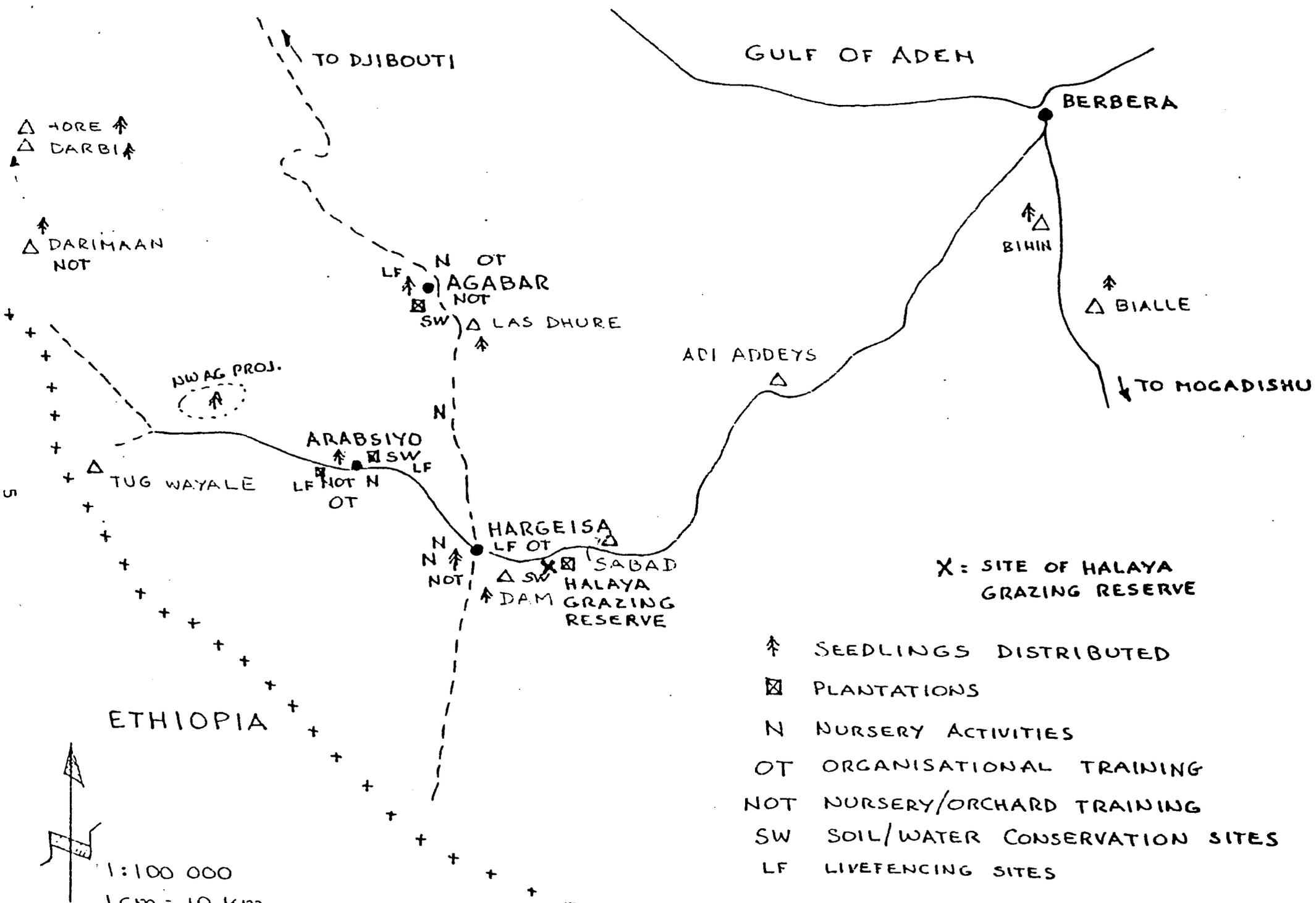
On-face comparison of projected figures with actual accomplishments shows that in terms of person-days of employment provided and beneficiaries reached, the project has more than achieved the set targets. Also, the project has laid a solid base not only in extension and general awareness activities, but has developed a local training staff and structure that functions effectively at the new (target) refugee camp sites, in near-by villages as well as in Hargeisa. Project-trained local male and female extension workers are now actively engaged in promoting and encouraging a wide variety of forestry, conservation and horticultural activities which lead beyond the original targets (and expectations). In addition, local extension and community education trainers have been taught who can instruct additional staff in the future. Accent on helping people (refugees and villagers alike) to set up their own small businesses and enterprises (fruit tree raising, e.g.,) has led several groups to develop small business operations on their own initiative. Also an encouraging number of "unsolicited" requests for advice, seedlings and assistance has been addressed (establishing live-fencing or private fruit tree nurseries, for example). Thus, a (mainly) locally run and managed system has been created (at two campsites in Hargeisa), no small task for just two years.

Problems, however, have occurred with regard to plantations and woodlots. Land of sufficient quality to economically produce fuelwood (one of the expected project outputs) is not available. While government officials (NRA, Camp Commanders, etc.) can readily identify tracts of land that could be reforested, customary and traditional surface-use rights still exist that must be reconciled. In a centrally planned and executed project, this can be done relatively rapidly with the help of a strong fence and deploying watchmen or guards. A project conceived to operate on a community-oriented basis, however, will fail miserably if it attempts to work in land that has been expropriated by outsiders from the members of the same community that are supposed to participate and profit by it. Land of sufficient quality and of sufficient size is simply not available unless long, tedious (and expensive) arrangements first are made with those who are presently the de facto users. The agreement clause that NRA would provide that land proved unrealistic.

A second problem arose in achieving seeding target numbers. Well intended forestry project designs frequently call for a substantial quantity of seedlings to be produced in nurseries as a first, important step. The problem, however, arises when they are ready for planting and no land is available. A number of them certainly can be used for "amenity" plantation around houses and compounds.



MAP 1 GENERAL LOCATION



1:100 000  
 1cm = 10 km  
 SOURCE: UNHCR

- X: SITE OF HALAYA GRAZING RESERVE
- ↑ SEEDLINGS DISTRIBUTED
- ⊠ PLANTATIONS
- N NURSERY ACTIVITIES
- OT ORGANISATIONAL TRAINING
- NOT NURSERY/ORCHARD TRAINING
- SW SOIL/WATER CONSERVATION SITES
- LF LIVEFENCING SITES

MAP 2 PROJECT ACTIVITIES

More than 80,000 trees have been planted in this manner, exceeding this particular target. Seedlings also have been produced as fruit trees or to establish live fences (an important anti-desertification contribution in view of the great and continuous need for branches for traditional fence material). Approximately 70 ha have been or are now in the process of being planted. As woodlots producing fuelwood and thus helping redress deforestation, however, they are a failure and should not be continued. Growing conditions are poor. These sites, on the other hand, would make ideal models where it could be shown how, through applying a wide array of biologic and physical forestry and soil/water conservation measures, all natural resources at a specific site (land, water, vegetation) can be restored, managed and conserved, not only trees for fuel. Some of this work has started at two sites, with encouraging first results.

Extensive experience elsewhere, from Kenya to Senegal, has shown that trees can be grown on dry sites. A host of projects financed by many different donors have in the last ten years achieved major successes in rehabilitating dry-land vegetation cover in Africa. At the same time, it has been found that in relatively arid situations, trees cannot be spaced as densely as was originally calculated for this project (3x3m or 1,100 trees/ha), site unseen. Rather, a wider spacing must be used, together with more extensive micro-site improvements around each tree, such as water catchments in crescent or diamond form. A Norwegian project near Lake Turkhana, for instance, after in-depth trials, has established a 10x10 m spacing (= 100 trees/ha). Judging present tree performance at the project sites and taking experience elsewhere into consideration, I feel strongly that tree spacing in this project should not be denser than 4x4m (or 625 trees/ha) at the most favorable sites and that, for projection purposes, an average of 5x5m (400 trees/ha) should be used. Recalculating the total amount of seedlings required on this basis and including the original number for amenity plantings and even figuring a loss of about 30% for culling, transport and planting "accidents", no more than about 250,000 seedlings have to be raised to accomplish the original targets. At present, the project has produced and used about 270,000 seedlings. A strong case therefore can be made that the project has fulfilled as many (and then some) of the original targets that have proven feasible and possible. Certainly a serious mistake would have been committed if, simply to reach the unrealistic target-figure quoted in the agreement, trees would have been produced in nurseries, for which there would have been no place to put them! As it turns out, no more seedlings than realistically planned have been distributed, are planted, and are being taken care of. Project staff deserves credit for this.

Survival and, more important, satisfactory growth and production at present is estimated to be 75% or better for trees planted around compounds and in public places (schools, for instance). Trees on a total of 60 ha woodlots and plantations are not doing nearly this well. In spite of some watering during the present dry season, overall survival now is no more than about 60% and further losses will occur before the next rains begin, normally in March. As mentioned, sites are poor and soil is severely

eroded. Also, in the end, it is not "survival" that counts, but trees "growing and producing reasonably well", an entirely different matter. Not surprisingly, natural tree and shrub vegetation does quite well in these "woodlots", where they are now protected from free roaming animals.

Construction is seriously behind schedule. OEF can cite a list of apparently valuable reasons such as transfer delays of several months in receiving local funds, large cost overruns due, in part, to inflation and a request for higher design standards by NRA. Perhaps the most telling item is that OEF was asked to pay an exorbitant fee to obtain copies of standard construction plans and specifications by the responsible government office, so that a local architect first had to be hired to produce them.

The most discouraging aspect has been the lack of collaboration between Agreement parties. A number of specific obligations were spelled out for each of the partners to fulfill. Quite a few of them however have not been met. The following speaks for itself:

1. As instructed, OEF thus far furnished nine quarterly, biannual and annual reports, based on which AID, per Agreement, was to have "provided written feedback". Nothing in writing from AID on any of them has been received.
2. An interim evaluation, without advanced notification to OEF, was carried out by AID/NRA forestry advisor in February 1986. Nothing in writing was delivered on how "this evaluation will assist project personnel in making any necessary changes for the second part of the project." A review meeting did take place, to be sure, after his visit. There, OEF was told it was not meeting its targets. Six months later, AID transmitted to OEF the only PIL which OEF has received on this project thus far, changing targets, which were based once more on technically unrealistic spacing. (See above)
3. "Substantial involvement... in the implementation by AID... was contemplated" and spelled out in the text of the Agreement. A total of three monitor visits plus two by a program officer and one by the AID/forestry advisor were carried out. The Agabar site was visited only twice by AID representatives. No written feedback, observation, or comments were given. Obviously, there was no involvement in this project by AID, other than a few brief visits and pressuring OEF to meet targets which make no sense. Nor has NRA, the third party of the Agreement, provided the land, as called for.
4. On the land issue, AID and NRA both seem to feel that OEF's project staff should have been able to somehow come up with land suitable for woodlots which, considering the complex and unresolved land-right conflicts between modern law and traditional use-patterns, is virtually impossible in just two years.

Not surprisingly both AID and NRA tend to compare OEF's performance,

its relationship with their Mogadishu offices, and its overall achievements with the other US PVO's under similar agreements. Three major differences exist, however, which people seem to sometimes forget:

- The OEF forestry project covers only a total of two years. All others are, or were, four-year projects. Comparing end-of-project accomplishments, one must keep this important difference in mind.

- Contrary to all other PVO's that carry out AID-sponsored forestry projects, OEF is the only one that does not have other program activities in Somalia. All others have full-scale country headquarters located in Mogadishu with a host of US as well as Somali permanent staff, which handle other project activities as well.

- The OEF forestry project is located in the Northwest of the country, further away than any of the others and requiring air travel between the project headquarters in Hargeisa and Mogadishu.

This remoteness from AID and NRA main offices and not having any other activities in-country does place OEF at a considerable disadvantage compared to the other PVO's. OEF's routine contact and relationship, especially with AID, are not and cannot be expected to be the same. At the same time, while other PVO's can use their Mogadishu office staff to expedite and short-circuit a number of important administration activities and do the legwork which other parties of the agreement should actually be doing, OEF does not have the same broad, regular and continuing capacity. While it would be unfair to hold this against OEF, it is understandable that often, AID and NRA nevertheless expect the same "coverage".

OEF's only error in this was that the project staff did not, from the beginning, insist hard and formally enough for minimal contract compliances. To make an issue out of it now is too late: Phase I comes to its end on December 17, 1986, and relationships, largely due to the shortfalls listed above, are such that a second phase would most likely run into exactly the same difficulties, unless a new and much more cooperative and supportive approach takes place.

In view of the excellent technical and human resources development efforts and the encouraging, visible results in the field that have been achieved, OEF has made a valuable contribution in a short time and, seemingly against unpleasant and discriminating odds. To get community development activities underway takes considerable groundwork and preparatory time. Yet, in only two years, a local-based, service-oriented, multi-level extension organization has been created by OEF and their local counterparts from NRA and SWDO. Managed by a coordinating group where local representatives (many of them women) regularly and frequently meet with local authorities and representatives of National agencies, local project staff is beginning to run its own show. SWDO is playing an important and active role in providing advice and guidance helping local women take an active part in the development and conservation of the areas

natural resources. Moreover, a generally applicable and field-tested extension and dialogue-approach has been developed and is functioning at three separate sites. Actually, this goes beyond specific objectives of the project and has given the many local people "reached" or "touched" a chance to be somewhat better off than before.

An encouraging start has been made in an area and in a situation that has been difficult for OEF in many ways. Its capacity to put together a people- and service- oriented extension structure can be judged by visiting their nurseries, especially Agabar. AID, in all fairness, also deserves credit for having made the commitment to fund this kind of effort in a difficult climactic zone and where everything had to be started from scratch. As "seed money", the half-million dollars (AID's contribution in dollars) has helped put a local management capability into the field that now can be used to replicate similiar activities in other parts of the region or as "extension components" to other rural development efforts.

The overall impact that this project has had is considerable. It is safe to state that compared to other efforts of this size and relatively short duration, it has done exceptionally well. While many positive and tangible results have been achieved, an even greater and latent potential, in terms of progress and impacts, presently exist that could be materialized in real and meaningful form, if activities could continue. Physical outputs (trees, live-fences, soil conservation) as well as development of human resources, especially local women, could be expanded considerably, based on the solid extension, education and organizational groundwork that has been laid. The Participation Management Systems which OEF has helped create as part of this project, deserve continuous support and consideration.

The organizational training which was begun, blends with practical forestry and conservation "low-resource" interventions. This project holds promise which it could effectively demonstrate and fulfill, provided of course, funds are available for the very important, next phase.

I. PROJECT STATUS

A. OVERVIEW

Project title: CDA Forestry Phase I (OEF)

Other reference titles: Community Forestry in  
Refugee-related Areas,  
Community based forestry  
activities.  
OEF/SWDO/NRA Forestry  
Project.

AID Project Number: 649-0122 (OEF)

Date of agreement signed: 17 December, 1984

Project completion date: 17 December, 1986

Duration: TWO YEARS

Overall Objective: Redress deforestation, provide work for  
refugees and their neighbors and strengthen  
the institutional capacity of the NRA and the  
SWDO in the Northwest. Through: woodlots,  
windbreaks, horticultural training and support  
and training to the NRA and SWDO.

B. ESTIMATED TOTAL COST — THUS FAR (November, 1986):

	Originally Budgeted 1\$ = 16 SSH	Actual amounts spent or committed 1\$ = 89.6 SSH (see note)
AID contribution	\$506,000	\$450,000
GSDR (CIPL)	SSH 11.861 mio, or \$741,300	SSH 17,500 mio, or \$195,312
In Kind, NRA	\$376,000 = \$23,500	SSH 60,000 = \$670
SWDO	\$403,000 = \$25,200	SSH 20,000 = \$225
OEF	\$93,200	\$85,000
TOTAL	\$1,389,000	\$731,200

Using an exchange rate of 1 \$ = 16 SSH the last column in the table above reads as follows:

ACTUAL AMOUNTS SPENT OR COMMITTED		
AID	\$ 450,000	(unchanged)
CIPL	1,093,300	(= SSH 17,500,000:16)
IN KIND	3,750	
	1,250	
OEF	85,000	(unchanged)
Total	\$ 1,633,800	

An estimate of how much the project thus far has actually cost, depends — as shown here — on the exchange rate used. While arguments in favor and against all of them can be made, the most realistic, in many ways, show a total of \$731,200 of thus far expended or committed.

Note:

- The actual (25 November, 1986) "bank rate" of 1 \$ = SSH 89.6 was used to arrive at the figure of \$195,312 used above.
- The figures for AID and OEF's contribution are based on best available estimates of the OEF field staff at Hargeisa.
- The rate of 1 \$ = 16 SSH reflects the actual rate used at the time the budget was prepared (also quoted in the Cooperative Agreement).
- Funds shown in SSH were generated from the sale of Title I commodities (PL 480) under AID's Commodity Import Program (CIP).

## C. SUMMARY OF TARGETS & ACCOMPLISHMENTS

### 1. Specific Objectives, Targets

(see table 1 for a summary of planned versus accomplished targets)

The following project outputs (listed in Annex 1 of the Agreement) were envisaged and established as project "targets":

- 60,000 person-days of employment,
- at least 3744 beneficiaries gain through increased fuelwood supplies and a more stable agricultural environment,
- 200 ha block plantations, 40 ha community woodlots, 80 km of shelterbelts (a term, which in this report is used interchangeably with windbreak). This was changed by PIL No. 31 of September 14, 1986 to: 100 ha block plantations, 40 ha community woodlots and 180 km of shelterbelts,
- 580,000 seedlings, changed by the same PIL to 541,000,
- construction of resident/office building at two camp sites and an office/storehouse at Hargeisa,

- develop detailed, integrated staff training plan,
- develop nursery and tree planting manuals in Somali,
- develop horticultural activities at two camps.

2. Actual Accomplishments

(additional information on project accomplishments and statistics are listed in annex 1 to 4)

a. Employment

400 persons have been paid for a total of 75,000 person-days of labor: 75% of them were refugees, 25% local people; 55% of the total were women.

b. Beneficiaries

- Wage earners: 400 people, per above.
- Amenity plantations: 56,000 people (about 7,000 families), 70% of them are refugees, 30% local people.
- Live fencing, windbreaks and fruit trees: 5,600 people, or 700 families, mainly local farmer/gardeners.
- Major training activities: 30 staff, 50 members of participating organizations (SWDO, schools, etc.) and, through on-going extension-education training, approximately 70 small farmers and their families. (For more details, see section on "impacts".)

c. Plantations: Woodlots, Windbreaks, Live Fencing, Agroforestry

- Two nurseries were started, one at Agabar, one at Arabsiyo, in addition the NRA nursery in Hargeisa was reinforced and several private enterprise nurseries begun.
- 40 ha at Arabsiyo; vegetation rehabilitation (fencing and tree planting) and soil conservation.
- 60 ha at Arabsiyo for resource restoration under consideration. Land ownership status uncertain.
- 8 ha at Agamsa under development including live fencing, windbreaks, intercropping of trees in vegetable gardens.
- 20 ha at Agabar; vegetation rehabilitation and soil conservation.

- Local farmers in the same area have begun to establish their own windbreaks and live fencing with seedlings from the project nursery on the land they farm.
- 25 km of windbreak-type tree lines along ridges ("bunds") that have previously been established.
- For these activities, a total of 189,300 trees were planted and/or distributed. (Also see annex 4.)

d. Amenity Plantations

A total of 80,700 trees have been distributed throughout the region as shown on map 1. A total of seven refugee camps and about 10 villages or house-clusters have been served, as well as the town of Hargeisa.

e. Construction

Toolsheds, toilets have been built at two locations and a temporary office/lodging building has been refurbished. No other construction has yet been taking place (see section on shortfalls).

f. Training, both Formal and Non-Formal, Including Extension

An impressive amount of training plans and material have been developed. Examples: a complete staff training plan (Sept. 85), copy in supplemental annual report 1985, and of nursery practices, tree planting notes, 47 pages in Somali.

- 13 staff personnel have attended an 8 weeks course in project management and community development. (Detailed training report on file, OEF.)
- 12 staff: Surveying and mapping,
- 11 Refugee women: (formal) nursery practices,
- 20 staff instructed in word-processing; they in turn, have trained 25 other people, some staff, some others.
- 8 staff: driver's training and education,
- 2 staff: natural vegetation surveys,
- 8 trainers: vegetable growing and gardening,
- 17 women extension workers: course work in gardening and enterprise feasibility analyses, including weekly, on-job follow-up training.

- 12 SWDO members: on-job mini-nursery practices,
- 3 blacksmiths instructed in manufacturing metal charcoal stoves,
- 10 refugee women: how to build solid mud-stoves,
- 12 staff: conducting socio-economic baseline surveys,
- 20 people: horticultural techniques; one follow-up training session each week since last August.
- 100 people: Basic, one-shot horticulture demonstrations.
- Also, about 7,000 people received basic instruction in tree planting and maintenance.

g. Base-line Socio-Economic Study

Completed in October 1985, a synthesis report of this study is attached to OEF's supplemental annual report, 1985. Thirty families at two locations were interviewed; the basic findings serve as primary "entry" data base.

h. Short-term Specialists

Beekeeping and small-scale business enterprise have been addressed in two short-term visits by specialists. Both have resulted in setting up specific project activities in their fields.

### 3. SUMMARY TABLE:

Planned targets versus actual accomplishments(see map 2 for location of activities.)

Item	Planned Targets Norms to Achieve	Actual Accomplishments	Performance Rating
(1) Employment	60 000 persondays	75 000	125%
(2) Beneficiaries	3 744 people (at two locations)	7 000 people raising trees at 10 locations	187% (500%)
(3) Block plantations	100 hectares	see soil and water conservation	
(4) Community woodlots	40 ha	not feasible	0
(5) Shelterbelts/windbreaks	180 ha	25 km plus num- erous individual live fences °	not feasible
(6) Seedling (production costs are shown in Annex 3)	250 000 ea(see text for adjusted calculations)	270 000	108%
(7) Construction	3 sites	approx 10% complete	10%
(8) * Staff training plan	develop	done, on-going substantive results	more than planned
(9) * Nursery, tree planting manuals	develop	done, approx 40 pages	more than planned
(10) * Horticultural activities	2 camps	8 ha + many individual farmers	far more than planned
(11) o Soil Conservation, restoration	0	2 sites total, 60 ha plus individual micro-catchments	far more than planned
(12) o Water conservation	0		
(13) * Skill Upgrading	0	245 people	more than pln
(14) o Base-line Survey	0	30 families interviewed	100%
(15) o Bee-keeping	0	Program begun	more than pln
(16) o Small business	0	1st consultancy in progress	more than planned
(17) o Participation Management Systems	basic thought expressed	substantial, active development	far more than planned

- \* = unquantified in project documents  
o = not mentioned in project documents  
° = actually "enrichment planting parallel to contour ridges in a grazing reserve.

Comment:

- 1) Only one item, "construction" (7) is short of its target.
- 2) Three items:, block plantations (3), community woodlots (4), and wind breaks (5), are unrealistic and project efforts were shifted onto others. e.g (11) and (12), soil and water conservation.
- 3) All others have been exceeded, many of them by a large margin.

## II. PROJECT CONCEPT, AGREEMENT, TARGETS

### A. THE BASIC PROJECT CONCEPT

The project was designed in the first half of 1984. Forestry and conservation efforts, at that time, generally focused heavily on three major areas: anti-desertification, fuelwood production (that is: energy or "biomass") and local participation.

Socio-economic considerations for local people and with it the emphasis on developing local initiative and increasing opportunities to earn additional income, continue to be important design considerations today. The accent on fuelwood production, however has changed considerably. Discouraging experiences with block plantations (industrial, large-scale) as well as village-level, "community woodlot" types have shifted project concepts, objectives and targets toward a wider, less production-ambitious but more balanced focus. This has lead toward an increased accent on such activities as agroforestry and natural resource restoration and conservation.

Forestry activities in dryland Africa today, are directed more and more toward improving the general tree-cover in a given landscape, rather than holding to more traditional concepts of forestry and forests as dense stands of trees, managed primarily for the production of wood and treated as areas set aside especially for (only) this purpose.

The reason for this is simple: Large-scale as well as smaller, village-level forest plantations, at least in areas where annual rainfall is less than 700 mm, have failed to a large extent. At least in the sense that stand establishment and protection costs are much higher than anticipated, survival is much lower and tree growth has been very disappointing. While these negative experiences in part may have been caused by technical shortfalls (poor genetic stock, poor planting material, inadequate planting techniques, etc.), the major obstacles encountered are of socio-political nature: uncertainty of land tenure, questions about tree benefit and distribution, continued pressure by free roaming animals, bushfires which are often man-caused, to name just a few.

The bottom line is that village woodlots, communal forest plantations, thus far at least, simply have not worked. On the other hand, efforts in agroforestry and natural resource restoration and protection have seemed to fare a lot better. Experience elsewhere has shown that trees dispersed in a landscape (whether they produce a lot of fuelwood or not) have and can do more to redress deforestation, act against desertification and provide a more stable environment than carrying out woodlot tree planting activities under a formula of ownership and collective participation that has yet to prove its worth.

Project design can not be faulted for not having included these kinds of considerations; most of them have only evolved and taken more definite

form after this design had been conceived.

A second, more evident point has not been addressed the way it should and could have been. The basic assumption that land for forestry activities would be readily available was incorrect, particularly in a project whose main focus was to be on local participation and encouraging local, voluntary initiative. The basic, nationwide law, that all land belongs to the government, exists in many other dryland African countries. Experience there has shown for a number of years that while such texts are in effect, traditional customs frequently, if not always, protect local farmers or pastoralists who hold long-standing surface use rights. Sure, many large scale forest plantations have been established on land which has been turned over to the project by government agencies who hold legal claim to the land. But experience has also shown that one must look closer and deeper into how the traditional users feel if, suddenly, access to their pastures, trees and farmland is prohibited. Planting trees on what in effect amounts to land expropriated without compensation, is a totally inadequate basis for a people and community oriented forestry project such as this one.

Where voluntary, goodwilled, local participation is anticipated, indeed is used as the lead theme for a project, simply assuming that "readily available" land will be "provided by the NRA" (page 2 of Cooperative Agreement) is an error for which AID forestry projects elsewhere (including Senegal or the Gambia, for instance) have paid dearly ever since. That was predictable and could have been avoided in the design. Project staff, in fact, should be complemented for not having insisted more on carrying out project plans over the objections of local users, although project paper-targets could have been better met.

### B. THE COOPERATIVE AGREEMENT

The project's Cooperative Agreement between OEF, AID and the NRA includes Annex I (Project description) and Annex II (General Provisions). OEF's Project Proposal of June 27, 1984 is listed in the agreement as additional reference.

For a project that is to undertake community based forestry activities starting from the beginning, the two year allocated time period is very short. Too short, in fact. This is highlighted in the Proposal which expresses the hope (on page 3) that "following an end project evaluation, a funding commitment can be made for an additional number of years".

The project's purpose(s) is defined at several places:

- "Redressing deforestation, providing work opportunities and strengthening SWDO and NRA" on page 3.
- "Train refugees to implement forestry and horticultural activities" on page 1, of annex I,
- "Introduce energy saving techniques" are listed in the logframe of the proposal.

Specific objectives are listed (Page 1, Annex I) as summarized above (Sec. I. C.)

What would perhaps have helped is mentioning of an additional target-point covering extension education activities focusing on showing, training and encouraging local people how to introduce and maintain trees around their houses, their fields and gardens as well as in other places where production and conservation benefits would (eventually) accrue to everyone.

Also -- as the experience during the two years of project life has shown -- the provision of an additional target would have been helpful covering the answering of questions and responding to unsolicited requests for assistance where local people, on their own, expressed an interest in integrating trees (for fruit, fodder or fuel) into their farming or gardening operations.

Collaboration among agreement partners was defined rather thoroughly: for one thing, the Cooperative Agreement established a rather detailed reporting requirement/schedule on quarterly, semi-annual and annual basis. Furthermore it called for "Special Reports (Memoranda) to be submitted by OEF in case events occur between the reporting dates that may have a significant impact on implementation: problems, delays, adverse conditions, including a statement on any AID or NRA assistance needed to resolve the situation."

For another, the agreement stipulated (page 2) that AID and NRA will provide written feedback on the reports and "assist the recipient in resolution of any implementation problems identified."

Thirdly, the agreement stated that "within the limits of available staff time, AID will provide technical advice and information to OEF utilizing AID's Regional Advisors and USAID Project Manager...", and "to assist the Recipient in the implementation of the project, and as part of the substantial involvement contemplated in this provision, AID from time to time, may issue sub-project PILS that will furnish additional information or guidance to the recipient..."

How well each agreement party has adhered to these stipulations will be covered in additional detail later.

### C. TARGETS

Much concern over meeting immediate, tangible, measurable targets apparently exists particularly at the USAID/Mogadishu level. OEF's entire project performance seems to be pegged to how closely numbers of seedlings produced and surfaces planted have been met. The targets are listed above. What follows are some general comments on the subject. Specific technical issues that affect targets further are covered in Annex I and should also be taken into consideration to fully appreciate this issue.

As near as can be determined, project target numbers were established during the design phase with the assistance of a locally hired forestry consultant whose figures were reviewed informally by the REDSO staff forester who -- however -- was not familiar with the project site.

As it turned out, these first estimates proved unrealistic. An in-depth analysis, unfortunately has not been made and formally stated until now. This has caused considerable consternation and some disagreements between AID and OEF project staff (as well as -- to a lesser degree -- with NRA).

At issue is the total number of seedlings the project should produce to meet its numerical targets. The total target figure of 540,000 seedlings (reduced from the original 580,000 by PIL No. 31), is critically analyzed in the following section. New figures then are calculated and submitted here as the ones that should have been used.

#### 1. Seedling Requirements

The basic assumptions used to calculate total seedling requirements resulted in a number that is considerably higher than the one actually needed to do the job.

The difference is mainly due to two factors:

Spacing in plantations, is one of them. Tree spacing was based on a 3m x 3m pattern which in reality (and based on at least a dozen projects in about that many other countries with similar soil and climates) should not be tighter than 4 x 4. In fact, most planting efforts in similar climatic zones elsewhere in Africa today, are carried out between 5 x 5 and 7 x 7 meters. Experience at the project sites has indicated that substantial, additional efforts in micro-site improvement are necessary. Water conservation/harvesting efforts at each individual tree planted are crucial to better survival and performance. Therefore, tree planting should be based on a spacing of 5m x 5m, instead of the 3m x 3m spacing used to calculate targets.

While a 3 x 3m spacing requires about 1100 trees per ha, in a 5 x 5m spacing, only 400 trees/ha are needed. The implication this has on target figures is obvious.

Similarly, windbreak design normally (see for instance CARE/Niger's extensive and quite successful windbreak project in the Majjia valley) is based on two rows of trees, with intervals in each line in the order of three to four meters between trees. If a four meter spacing is used, this would require 50 trees for every 100 m, thus 500 trees per kilometer of windbreak are needed, instead of the 2000 used as basis to calculate numerical targets for this project.

Note that on this basis an entirely different ratio between ha of woodlots and linear meters of windbreak also would result. The one used equates 1 ha of woodlot to 1 km of windbreak. In Niger, 100 m of windbreak protect one hectare of land and it was found that trees in the same 100 m section will produce nearly as much firewood and poles as 1 hectare of plantations.

It follows from this that the number of seedlings needed to carry out the planting targets for windbreaks and woodlots, instead of the 540,000 mentioned in the PIL No. 31 should be re-calculated as follows:

For Woodlots:

- Original target of 240 ha at 1100 trees per ha = 264,000 trees.
- Reduction for wider spacing and reduced area:

$$264\ 000 \times 140/240 \times 400/1100 = \underline{56,000 \text{ trees.}}$$

For Windbreaks:

- Original target of 80 km of wind breaks at 2,000 trees per km = 160,000 trees.

- Increase in length, but reduction for wider spacing and fewer lines:

$$160,000 \times 180/80 \times 500/2000 = \underline{90,000 \text{ trees.}}$$

Thus, a total of 146,000 trees are required. In calculating the nursery production, provision for a series of losses will have to be factored in:

- 15% final culling of nursery stock as it leaves the gate,
- 10% in field temporary storage and transportation losses,
- 10% planting losses.

Therefore the number of trees that have to be produced in nurseries to provide sufficient planting stock of acceptable quality, for woodlots and windbreaks, should be:

$$146,000 \text{ trees} / .9 \times .9 \times .85 = 212,000 \text{ trees}$$

To this, the original target of 46,700 trees for amenity plantations should be added which will give the total number of trees actually needed:

$$212,000 + 46,700 = 250,700, \text{ or roughly } \underline{251,000}$$

- Please note:
- 1) This is less than half of the figure originally established as project targets
  - 2) So far about 270 000 trees have actually been planted or distributed, about 10% above the adjusted target figures.

While using these target figures as scale to judge the performance of a project, this also can distract and cloud the project's original intent and overall goal which -- in this case -- is to involve local people and their communities. Tree counts alone, obviously will not give a useful measure of how well this has been done.

Instead, emphasis should have been placed on also measuring local participation, training, extension and establishing a basic dialogue with local people (refugees or settled farmers). The pursuit of, and the concentration on numerical targets (only) of trees produced or hectares planted, misses the intent for which the project has been undertaken.

Besides, such figures can be changed and juggled easily. If one wanted to increase tree numbers drastically to make the figures look better, all one would have to do is to count the seedlings necessary to establish live fences, for instance, around plantations. By way of a brief example only, assume that the total of 140 ha of "woodlots" are distributed

among four, individual plots, each containing approximately 35 ha. This would result in 4 squares, with sides approximately 580 m long. The total periphery around all of the plots would be: 4 sides of 4 lots at 580 m per side, or a total of 9,280 m. A two row, dense life fence requires 6 seedlings per linear meter. Thus, another 56,000 trees could be "pushed." This would increase nursery performance (counting the various losses mentioned above) by another 80,000 trees! The numbers and with them targets achieved would be significantly higher, though no increase in reforested surface planted would have occurred.

## 2. Woodlots, Windbreaks

The change in surface area for woodlots and length of windbreaks has already been discussed. What also has been mentioned already, but worth repeating here, is that the envisaged purpose or function of the woodlots, in view of the poor soil and climatic conditions, has been rather ambitious, unrealistic and too narrowly focused on wood production aspects alone.

Though the concept is new to most African farmers, experience has shown that the advantages of windbreaks (or shelterbelts) are quickly realized by local people. However, unless considerable organizational groundwork is done beforehand, serious problems arise, if strips of windbreaks are installed without first determining precisely the overall layout, their location, how trees are to be protected and managed and who will benefit from the accruing, potential wood production.

Generally, deliberate, small-scale trials are a necessary first step. At the onset, tree performance (species selection, spacing, protection methods, etc.) must be experimented with in order to develop the most appropriate solution for a specific location or site. Then, organizational management training is needed to develop a system that local people are familiar with and that is acceptable to them. The most important points to be covered are:

- on who's land they are established (actual users and use-right holders may not be the same),
- how tree seedlings are to be protected: who is going to do it, how and who will/can enforce these efforts. Considerable administrative and legal backup is necessary and often first will have to be arranged,
- once trees have grown tall enough that they can be harvested (rationally, without jeopardizing their functions as windbreaks), who has the right to harvest and who are the beneficiaries. Also: private, individual interests have to be carefully balanced against those of the public.

Unless this preparatory work is done, simply "planting wind-breaks" across a landscape is worthless. Trees will not be adequately protected, tree ownership and benefits are uncertain and - not surprisingly - individual farmers and their families will not play an active role simply because of all the uncertainties mentioned, the whole scheme makes little sense to them.

In view of this, it is unrealistic to expect that during a start-up forestry project such as this one, specific production target distances of windbreak lengths can be achieved in just two years. It is particularly astonishing to note that such relatively large figures (80 km, later expanded to 180 km) were expected to be reached.

There have been other projects where this has been attempted. Trees were planted (on farmer's fields without adequate discussions with them) and protected with costs covered by project funds. In most of if not in all cases, however, most of the trees simply disappeared once project inputs came to an end. On the other hand, in other cases, progress at first has been slow. Only a few km were established and planted during the first two or three years. But once people have seen their positive effects (notably on crop yields in the areas protected by them), they participated with project and agency personnel to put together a package that they then actively supported and implemented and that has been expanding ever since.

This is the approach that probably could be applied here. But the original target setting of 80 and 180 km respectively for the first two years has to be regarded as impractical and unachievable. Instead and in hindsight, it would have been much better if the original concept (and targets) would have been focused toward the kind of introductory steps described above.

In the future, windbreaks should be installed with location-specific functions in mind. Design and maintenance of windbreaks vary, depending — among other things — on whether they are installed to protect rain-fed farmland, irrigated vegetable gardens or around areas where people live. In view of extensive bunding that has and still is being carried out in this region, establishing trees and shrubs along bund-lines (ridges) is a special type of "permanent vegetation strip" that will, in a way, also act as windbreak, but should be put in place differently than regular windbreaks. Such variations should be mentioned, at least in general form, when describing targets in a project of this kind.

Apart from not taking experiences elsewhere into consideration, or simply not having been aware of them, the original design should not be judged too severely. On the basis of the experience gained as result of the project activities, however, it is now important to point out that in the future the accent on forestry and conservation activities of these types should be clearly defined. This should not — as in the past — be done mainly with wood production in mind, but as efforts where a combined

set of techniques, primarily aiming at restoring and conserving the available land, water and vegetation, are to be applied. Trees or shrubs still have a valuable production function, but this should be secondary to improving and stabilizing, on a sustaining basis, the entire physical environment of such areas treated.

### 3. Employment and Beneficiaries

Employment targets were spelled out clearly in the Agreement and have not caused any difficulties in interpretation.

Beneficiaries, on the other hand, are much harder to define, let alone measure or quantify, except, as has been done, by citing a specific target number (in this case rather precisely: "at least 3744".)

It would have been helpful to differentiate the levels of benefits, as well as when and over what length of time they were to accrue. There is obviously a big difference between the amount of benefits family members gain from planting a few trees around their compound and others that the project helps to operate a vegetable garden, or to establish a stand of fruit trees including and training in nursery practices (grafting, for example) and proper tree maintenance.

### 4. Other, Un-Quantified Targets

While the project design did call for different levels of training, varying from in-depth and quite formal skill upgrading to general one-shot demonstrations, target-setting on intensity, approaches and expected change in skill-levels or attitudes would perhaps have been helpful.

If an evaluation methodology does zero in on measuring accomplishments in sets of numerical targets hit, then criteria should also have been set up to somehow quantifying non-formal, extension-type training activities that were planned and have been carried out. "Number of people reached", obviously is too vague a target to judge the accuracy of an intervention by. So are terms such as "redressing deforestation" or "providing Somalia with tools to conduct similar programs all over" the country.

What is needed, instead, are indicators that provide measurable information on such items as:

- How many people or families have taken advantage of services or products (like tree seedlings in nurseries) that the project has provided, and,
- How many of them have applied, on their own, knowledge gained, techniques explained and demonstrated, and how many continue to use them without further inputs from outside.

While targets for these kind of efforts and activities can be elaborated, albeit not without considerable (additional) personnel and funds, an assessment of how well they were met, is even more complex and time-demanding. Experts on the subject now seem to think that even comparing "before and after" surveys (such as the base-line study carried out by this project), will not provide information that is complete and reliable enough. What appears to be necessary is a series of continuing, unstructured but well-focused family interviews carried out during repeated informal visits. Insight into what people really have accepted and are continuing to carry on, voluntarily and on their own, are impossible to "evaluate" otherwise. Obviously, a regular evaluation mission can not accomplish this, unless on-going monitoring work of this kind has been carried out and results are readily available. If quantifiable, relevant numerical figures along these lines are desirable, the funds should have been made available to collect the data necessary to arrive at them.

One more target issue which has not been listed in the project documents is worth mentioning:

Soon after the first visual project activities were started, host-country as well as expatriate staff discovered that strong and consistent evidence of local initiative exists. Responding to requests, inquiries and other unsolicited, local initiatives is very important, in fact, it's what the project is all about. Often, project designers envisage activities in extension, education, awareness campaigns or "encouraging" people, assuming that no or little "native" drive or initiative exists. This has been covered in the design and appears in some of the targets as defined. But, nothing has been mentioned about providing services or information and responding to requests. "Targets" in this case, could be defined in terms of numbers of "clients serviced," inquiries handled, etc., unless a more sophisticated model is preferred.

In summary, establishing targets at the onset and then observing how closely they have been met in order to judge the performance of a project, is a valid concept. But more care should have been exercised in this case to make sure they include all relevant activities called for, not just the ones that are easy to measure.

### III. CONTRACT PERFORMANCE

#### A. OEF

The following table shows which of the various reports that the Agreement called for have been submitted thus far.

S				NYD				yearly reports	
1		1		S		NYD		bi-annual reports	
	S	S	S	S	S	S	S	NYD	quarterly reports
JAN	APR	JUL	OCT	JAN	APR	JUL	OCT	JAN	<u>PRESENT DATE</u>
1985				1986				S = Submitted	
								NYD = Not yet done	
								1 = Included in the supplemental annual report for 1985	

TABLE 2 - REPORTING SCHEDULE

In terms of additional, less formal reporting, OEF's project manager in Hargeisa has, on the average, visited the USAID/Somalia office in Mogadishu bi-monthly, since her arrival, in early 1985. Other field staff have made similar visits though less frequently.

The financial reports called for in the Agreement have been submitted regularly to AID by OEF's main office in Washington, DC.

Furthermore, the Africa Program director from OEF's home office has, during the duration of the project, visited Somalia (both Mogadishu and the field sites) regularly, about once every three months.

Additional contacts (also with the NRA and the SWDO) took place in frequent exchanges of letters, memos as well as radio messages between the project office and AID.

To ensure collaboration and contacts further, OEF employed a full time host-country office/expeditor in Mogadishu to represent the project office there in the interim, that is, between Mogadishu visits of either OEF project staff or OEF's Director for Africa and Middle East Programs.

But it should be pointed out, that OEF did not, at any time, take advantage of the Agreement's provision calling for the

(written) submittal of Special Reports (mentioned under II. B, above) Instead, the project staff felt that all urgent matters were taken care of by letters or during the project staff's regular visits at USAID/Mogadishu.

Reviewing the past two years, it appears that OEF lived up to its contract requirements quite well, especially as far as reporting is concerned. It seems also that the "Coordinating Group," (called for in Sec. I of Annex 1) has been established as planned, is functioning effectively, and has made a valuable and vital contribution to the smooth implementation of project field efforts.

In addition, it should be noted that OEF's project forester has taken the initiative in soliciting and receiving a considerable amount of technical information, assistance as well as supplies and materials (tree seeds from Australia, for instance). This contributed a lot to the quality and efficiency of the technical project aspects that he has been in charge of since the project has started.

Collaboration and liaison with Somali agencies have been good, especially with the Regional and National offices of the SWDO. This has proven vital in several instances and it is clear that SWDO has been a very worthwhile partner in this project. Collaboration of NRA also has been quite good.

Beyond the partners of the Agreement, project staff has had close contact with other projects active in the region: PFP, CARE and TransCentury among U.S. organizations, as well as representatives from UNHCR, UNICEF and the WFP and "third country" donor organizations, public, as well as PVOs (Oxfam for example).

What the OEF project staff should have done more forcefully is to insist on better complete contract compliance and to manage relationships with the other parties of the agreement to be better protected:

- Hand-deliver all reports to the other parties and demand written receipts to cover themselves against other partners now saying that "they never got them."
- Not hand out second copies of project generated documents except against written requests.

If OEF's performance and "management capability" (an item on the Ministry of Interior's evaluation) is compared with other CDA forestry project implemented by US PVOs, it should be kept in mind that all others have:

- a) their country-director's offices in Mogadishu, and
- b) other on-going projects in-country which warrant a larger and heavier presence in the capital.

This is why it is difficult for OEF project personnel stationed 1000 km

away to carry out the day-to-day running around required in Mogadishu as other US PVO's do to get tasks done that the other parties per agreement should have, but were not doing.

B. AID

AID's contact with the project consisted of the following:

Field Visits

- 3 official visits by a project monitor, plus several other informal ones while in the area on other business,
- 1 visit by AID's Forestry Advisor to NRA on the occasion of a mid-term evaluation (see below)
- 2 visits by a project management officer. Only 1 AID officer so far has visited the Agabar site, once.

PILs

- One issued by AID, No 31, September 14, 1986.

Twelve Month, Interim Evaluation

In February of 1986, an AID/NRA forestry advisor visited Hargeisa and informed the project staff of the mid-term (or 12 month) evaluation he was to conduct. No written report or other information on how "this evaluation will assist project personnel in making any necessary changes for the second part of the project" (Annex 1 of the Agreement, Sec. I) has been received by OEF.

AID did, however, call for a mid-term review meeting where -- according to OEF project staff -- they were merely told they were not meeting their targets.

Other Feedback

OEF has submitted, as shown above, 9 separate reports thus far: 1 annual, 1 biannual and 7 quarterly. Despite the Agreement's stipulation (on page 2) that AID -- and NRA, for that matter -- "will provide written feedback" on these reports, nothing in writing has been received by OEF along these lines.

One final note should be considered in reviewing or evaluating OEF's performance:

As pointed out in Sec. II, B above, "substantial involvement (in the implementation by AID) was contemplated" and spelled out in the Agreement. In view of how little concern, advice and guidance AID has actually provided — the list shown above is a summary of all AID inputs received by OEF — it is most difficult to judge the level at which AID has met its obligations positively. At best, it was marginally constructive.

In fairness, several reasons for this can be identified, though their validity is not vouched for here:

-- This project -- compared to all other AID projects administered by the mission -- is quite small.

-- It is located in one of the most remote areas of the country and is one of those that are furthest away from Mogadishu.

-- OEF has hired a local liaison contact, not a U.S. citizen, for their coordination with AID. This person is less familiar with procedures and AID office routine than a U.S. citizen would be. Other US PVOs either have their country-offices in Mogadishu or have hired U.S. personnel (frequently dependents of official U.S. staff members).

-- AID has relied on the reports received from OEF and carried out occasional field monitoring (inspection) visits. As long as things looked to be reasonably well on track, AID has felt that not much, if anything, had to be communicated in writing whether it was called for in the Agreement or not. Casual contact has been maintained in the form of meetings and visits and as long as it looked like things were moving along as well as expected, informal contacts sufficed. As seen by OEF field staff, however, during these informal meetings, AID project personnel has come down relatively hard on such points as target and certain administrative shortfalls without offering all that much assistance in return.

-- OEF's credibility in this part of Africa is not yet established. As a PVO, funded by AID, they are "new." Neither have they implemented a forestry program before. On the other hand, they have considerable experience dealing with women's issues in LDCs, which, according to the Project Documents is a lead theme.

The net result is that OEF-AID relationships in Somalia are not what they should and could be. Whatever the reasons for this unfortunate situation, AID however, and judging from OEF project records, must take the point that it has not lived up to the terms of the Agreement as it should have.

However, in the long-run, AID's participation should be viewed in a more positive way. Start-up or "seed" money of about one half million hard dollars has been made (promptly) available which has allowed OEF to

establish a solid beginning in developing people-oriented forestry/conservation efforts at two up-country sites as well as in the regional center in the Northwest. In close collaboration with NRA and SWDO, OEF -- thanks to AID's assistance -- has been able to help people, particularly women and refugees in a number of ways. In addition and of particular significance in a wider perspective, this project has, in just two years, been able to lay a solid basis for service-oriented, extension type activities which will allow a series of local initiatives to expand. They already are beginning to spread without further outside assistance. Furthermore, extension technicians (both men and women) have been trained and given a chance to work in the field with people that are receptive to new ideas and approaches (including earning income by starting small businesses). Also, basic resource conservation and management concepts such as live-fencing, soil and water conservation and rational small-scale irrigation have been introduced and are beginning to be accepted by people who -- without this project -- would not have had this chance. If the job OEF has done is this viable and good, other donors as well as host-country agencies and offices will notice the positive impacts and effects this initial effort has produced. Subsequent support and additional funds then are quite likely to follow and AID's contribution will have served well as a first step and challenge to undertake conservation-oriented, people-based activities in a difficult part of the country. The administrative shortfalls noted above, in the end, have not prevented good work from being done in the field and this -- from the real recipients' point of view -- is the only thing that counts.

#### C. NRA

As the third party of the Agreement, NRA has been quite supportive of OEF, especially in view of the fact that, among the many donor-supported projects they are carrying out, this particular one was quite small and did not involve much capital investment in terms of equipment, materials, vehicles, buildings, operational funds, study trips abroad, etc.

Personnel in adequate numbers was provided to the project as planned and collaboration in many respects was satisfactory.

Two problem-areas deserve described in some detail which may help plan, similar, efforts more realistically in the future:

#### Land.

This issue obviously reaches far beyond this project's particular needs. The assumption, stated in the project documents, that land is "readily available" is simply incorrect. NRA -- at least in this case -- can not provide the land without tedious and time-consuming negotiations with traditional surface-right holders. This is an internal, national-local problem that neither outside funding sources, nor their expatriate personnel stationed at the project sites, can or should get involved in. Attempting to adjudicate claims and rights to resources (farm land, water,

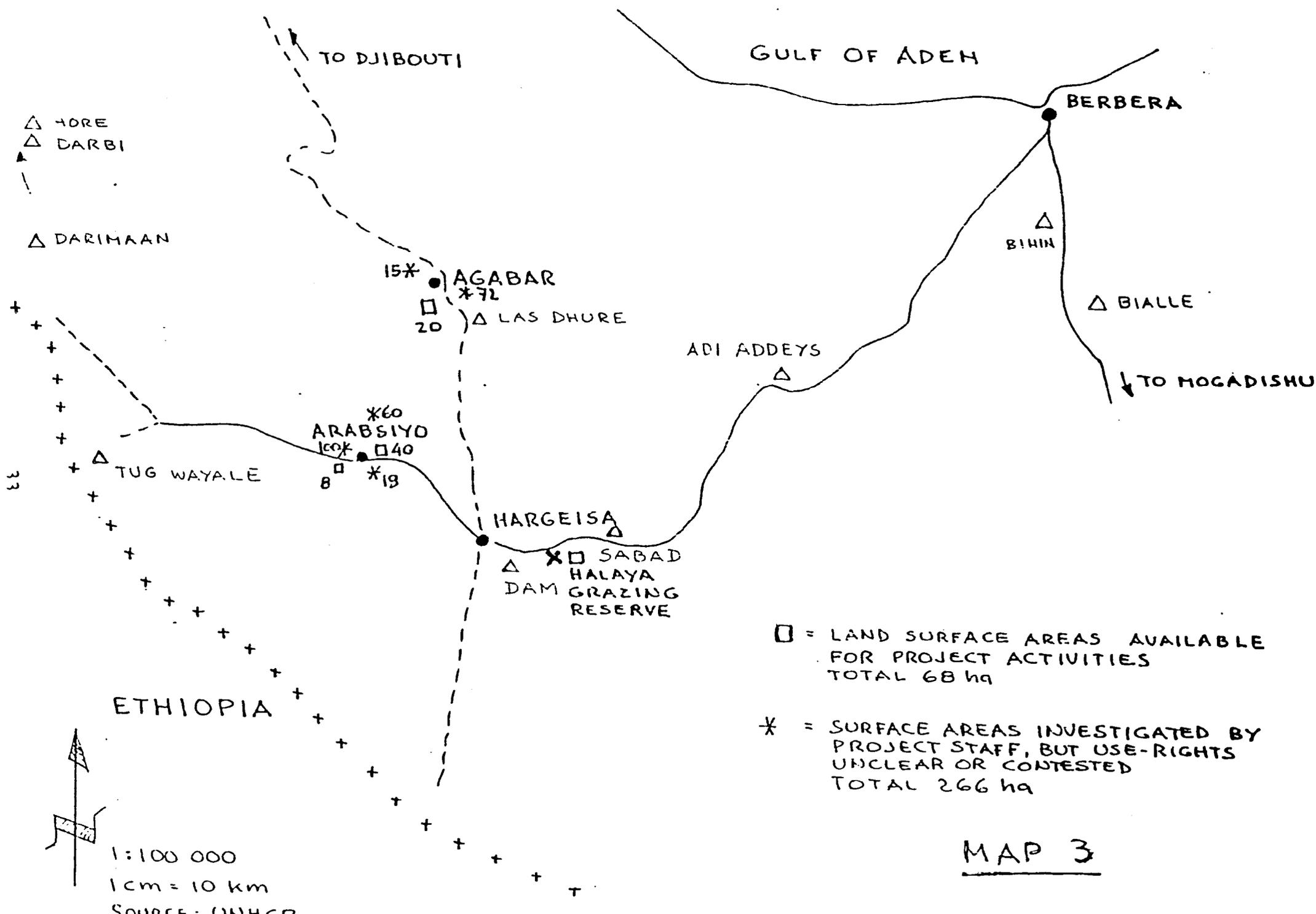
grazing areas, etc.) by outsiders is futile, at best. OEF's expatriate staff can not be held responsible for not having been able to settle land-use right disputes in areas that have been shown to them by government agents. OEF's forester has tried his best to help matters along, in a preliminary way. At least four different sites were checked out, following various leads. (see map 3) In all cases, prior use-rights by local people were discovered; the user-"owners" were not prepared to allow project activities ("village woodlots") to be installed on land they considered theirs.

This is not unusual and similar problems have been encountered in many other countries by many other funding-partners. As mentioned already, project designers should have been aware of this. Also, in the implementation of the project, much more of an effort should have been made by the responsible authorities to provide land on a fair and equitable basis, or the idea of creating solid, green tree-covered surfaces should have been abandoned. OEF should strongly reject any blame or responsibility of not having been able to "come up with" the land themselves. Also -- in the future -- care must be taken to make sure land is not offered for project activities from which local people have simply been evicted.

#### Construction Delays.

While OEF is responsible for part of the delay, NRA, in the future and in order to make it easier for implementing donor-agencies to provide what the project documents call for, should:

- NOT try to charge exorbitant prices for copies of standard construction drawings.
- Not increase size and standards of buildings.
- Not add construction items which were not originally called for (example: rockwall around NRA nursery in Hargeisa).



GULF OF ADEH

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△ DARBI

△ DARIMAAN

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\*72

□ 20 △ LAS DHURE

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↓ TO MOGADISHU

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8

TUG WAYALE

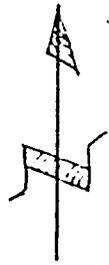
HARGEISA

△ \* □ SABAD  
HALAYA  
DAM GRAZING  
RESERVE

□ = LAND SURFACE AREAS AVAILABLE FOR PROJECT ACTIVITIES  
TOTAL 68 ha

\* = SURFACE AREAS INVESTIGATED BY PROJECT STAFF, BUT USE-RIGHTS UNCLEAR OR CONTESTED  
TOTAL 266 ha

ETHIOPIA



1:100 000  
1cm = 10 km  
SOURCE: UNHCR

MAP 3

#### IV. PROJECT IMPACT

##### A. OVERALL PROJECT IMPACT

In a wide-angle perspective, the overall impact of this project, given its short, 2 year duration and its relatively limited funding amount (\$731,200.00), is impressive. Taking the downward adjustment to the technically correct level of target figures into consideration, virtually all project targets have been met except for the (unavoidable) areas scheduled to be reforested as woodlots or windbreaks. Even these have been more than compensated by planting or distributing additional trees under other activities, such as amenity plantations, live-fencing, etc. There is no doubt that the majority of the 270 000 trees planted during this project's life, not only are growing quite well and are being cared for but that they are making an important and documentable difference (thus "impact") to the more that 7000 families involved.

Moreover, the numerous multi-level training, extension and service efforts carried out by the project, though not specifically expressed in target figures reached, are providing the basis for even longer-lasting and more significant impacts, specifically at three distinct sites and more generally, in a wider part of the North West Region.

In only 2 years and with less that 1 million Dollars the visible results, together with the (more important but less covious) changes in the lives of many local residents, compare quite favorably with many other similar efforts that have been made elsewhere. Even if this project does now have to be closed out for lack of further funds, much has been accomplished. Many of the results will remain and continue to be a source of encouragement and hope to those that project activities have touched.

It is important to point out that in addition to these accomplished and achieved impacts - the project, in its present state, also carries with it further and potentially yet more valuable impacts. As it stands now, an extension-, people- oriented, participatory management structure is operational which - if allowed to continue - would translate these latent impacts into additional progress and achievements. More farmers and gardeners could and would incorporate more trees and shrubs into their operations. More trees could be planted and taken care of by individuals as well as groups (schools or associations of gardeners, e.g.,). More local residents could receive training as extension agents, more people would be reached, also in terms of resource conservation activities which they can, by themselves, undertake and profit from.

Mainly because of its strong extension and training component as well as its people-oriented approach, the project also is now beginning to have an impact on other donors and other development projects in the area. Others begin to notice the visible progress that has taken place as a result of the project activities and are beginning to look into

possibilities of including similar efforts and models in other on-going projects.

With a relatively small, additional two-year investment (less than the FX costs of phase I), the potential outputs for which a strong base now exists, could be realized. This would permit the creation of a people oriented capacity to better conserve and, in some cases: restore, the rural, that is: agricultural productivity of the Region.

## B. SOCIO-ECONOMIC IMPACT

Beneficiaries and training activities have been summarized already in the Section "Targets and Accomplishments". The question on what the "real" impact of these efforts so far has been, is not easily answered. Some — including a GSDR evaluator — feel that it simply is unquantifiable. While the reality is not this bleak, it is certain that to measure the impact of a project on people is much more difficult and costly than addressing only the physical accomplishments (see "Targets" above).

Before and after or preferably "with and without" comparison would reveal the significant differences a project such as this has made. The socio-economic base-study carried out was to provide the necessary "before" data. Unfortunately no subsequent, systematic and comparative study that would give a second reference point has been scheduled. Besides, more recent experience elsewhere in Africa has shown that more than a series of surveys are needed to arrive at the more meaningful changes and impacts that may have resulted from training and education components that were carried out by a project such as this.

In absence of this kind of information, a general description can at least be given for those situations where impacts are obvious:

### 1. Employment

The benefits of employment involving 75,000 days of wages paid to local residents and refugees is significant, albeit temporary. While this may have greatly helped people at the time they received their wages, long-term permanent effects should not be over-emphasized.

### 2. Training

More important is the skill up-grading in form of extension and basic management that 35 people (young men and women from Hargeisa and vicinity) have received. The real value of this training is that a core-group of young, local people has been formed and given opportunities to practice and apply their skills as extension workers and development agents. Since they have been active, each has already been in contact with a number of local people (farmers, gardeners, refugees, both men and women, young and old) who otherwise would not have been reached. More important, some of them

have been trained as trainers and can now — in this project or in other, future efforts — serve as teacher/trainers to help others carry out similar activities. A multiplying capability has thus been created which has a good chance to sustain itself well past this project's ending date.

Measuring actual impacts, in this case, will be possible in the future where and if extension efforts carried out in this Region will be able to tap this resource instead of first having to train new and inexperienced people, as this project had to.

Another, very tangible, first impact is already evident: several other on-going projects in the area have expressed interest to incorporate some of the OEF's extension capability (and its people) into their operations. If any of these efforts materialize, the "impact" becomes self-evident; people trained (especially the trainers) going to work in other projects would represent direct proof of the value of the work done thus far.

### 3. Nursery Techniques

In Arabsiyo and Hargeisa, women (some of them from refugee camps) have received technical skill-upgrading training in nursery work. They are now undertaking tree and seedling production which includes follow-up visits where additional hands-on training is provided also covering managerial aspects of their work. In addition, they are getting first-hand experience in irrigating seedlings and small vegetable crops; all skills they are well able to use once the project has been completed. Indirect impacts of these activities extend to other people who observe these operations and find out that they, too, could learn to undertake similar efforts. In this respect, project activities have proven, that personal initiative and a "can-do" attitude will make it possible for people -- even with little or no up-front investment — to become more productive without much outside help.

### 4. Farming, Gardening

The project also has done a lot to provide other local residents with ideas and opportunities to improve their farming/gardening operations. One of the highlights are the many spontaneous and "unsolicited" requests and inquiries received at the nurseries. People see the work being done and pick up on a number of ideas (like live-fencing) that they are willing to experiment with themselves, on their own plots or fields. These "callers" are provided with some seedlings and instructions on how to go about establishing them on their own land. Also, occasional field visits carried out by project extension workers make sure they follow the advice given. At the same time, people are encouraged and shown how, in the future, they can undertake the work (raising seedlings or direct-seeding for instance) themselves, or together with their neighbors.

Impacts, in this case, can be measured by the number of requests received and by observing and recording the number of people that have

adopted specific ideas. What counts most is the number of instances in which people have begun to use techniques on their own and continue to use them without further inputs from the outside. Ultimately, changes in the landscape will be noticeable where live-fences, trees used as windbreaks, or scattered fruit trees will begin to appear where before, the spaces were bare.

#### 5. "Amenity" Trees

Another, quite visible impact are the many amenity trees that are beginning to be visible in and around the camps. Hardly a compound can be found that does not have at least a few project trees growing that are well tended. Shade around huts or houses is very important in this hot and dry climate, more so than in more temperate zones. While shade trees may be regarded as "amenity" by some, shade to people living here, is much more essential and important. Some of the trees are already large enough to provide some protection for a few animals that are kept in the compounds. Soon, many of the trees will also provide much appreciated supplemental animal feed in form of seed pods that they will produce.

Trees also play an important role around schools. A very nice example of local initiative in providing a pleasant and practical outside classroom setting exists at Agabar where a teacher in a coranic school landscaped the yard with well growing and well cared for trees. No doubt the students will remember this setting for a long time, the "impact" of such efforts is likely to be both valuable and impressive for years to come.

#### 6. Other Socio-Economic Impacts

A number of other training activities has already been listed under C.I.f. Some people have received specific skill-training in such subjects as surveying or word-processing. A much larger number, approximately one hundred, have received demonstration-type, one day instructions in specific horticultural or tree planting techniques. It is safe to state that, all in all, about 200 people have been exposed to training or demonstration activities of one form or another in subjects that are not only appropriate or applicable, but — judging from observing their farms and gardens — are of interest to them. The information given is being used; "adoption rates" seem encouragingly high.

In addition to this, about 7,000 families (both young and old), thanks to this project, now have trees growing in their yards they produce and protect. No small accomplishment for an operation only two years old in an area where nothing of this scale has been done before.

### C. PHYSICAL/ENVIRONMENTAL IMPACT

The physical, numerical output in terms of number of trees distributed and planted, surface areas covered and windbreak-lines established has been discussed already.

Four additional points deserve further scrutiny:

#### 1. From Community Woodlots to Land, Water and Vegetation Restoration.

The project is operating on 3 sites (counting Halaya) where resource conservation and production aspects can balance each other. In all of them resource degradation of one kind or another exists: sheet and gully erosion, wind-erosion, soil fertility reduction.

Each have long- as well as short-term production potential: Trees can produce wood, fruit or fodder as well as other important products: honey, fibre, tannin, etc. Typically, production cycles in this case are long-term. More immediately, grass (for forage, thatch or other uses) can be harvested; in addition, some wood, small poles, etc. may accrue from tree pruning and thinning operations. In addition some of the land can be farmed either on an irrigated (where water is available) or rain-fed basis.

The available resources (land, water, vegetation) at these sites must, however, be protected, conserved and where degradation has occurred, restored. This is where biologic and physical conservation techniques are applied: biologic measures include live-fencing, windbreaks, trees dispersed in open areas or gardens, or planted along stream, stream banks or along gullies. Another option is to establish trees and shrubs along bunds (contour ridges) or waterways where they can serve to protect as well as to produce.

Physical measures consist of micro-site improvement for planted trees. Micro-catchments in Vee or crescent shape are one example, careful and relatively extensive sub-surface preparation before trees are planted, another. Contour ridges (either earth or loose rock-rows), rock or earth gully plugs, waterway or stream bank protection all are applicable, depending on the specific locations. All can be carried out by hand labor.

The most important aspect of these efforts combine:

1) Conservation/Restoration with production (so important and necessary for local participation) and,

2) Physical as well as biologic conservation and protection measures which when applied together, naturally will lead to an ecologically balanced, sustainable and productive resource use system.

## 2. Introducing Agroforestry

Efforts to introduce windbreaks, live-fencing, border-line trees and other agroforestry techniques have been quite successful. In a matter of only a few months, people have noticed activities carried out in nurseries and — based on what they had observed — taken the initiative to replicate what they have seen, on their own land.

The greatest potential impact is in live-fencing. Living hedges, according to the first indications, can replace the traditional branch-fences that are common throughout the Region. These have to be repaired each year and large amounts of branches are required which are harvested in the bush. Camel-loads of branches are brought daily into towns and garden-areas and the pressure on natural vegetation is considerable. This can be eliminated if live-fencing techniques are adopted. In addition to reducing pressures on natural vegetation, live-fences require less maintenance. While they need pruned, additional branches become available. These can be used for supplemental fencing; holes in live fence hedges can be plugged or they can be used as temporary protection to protect a new section of live-fencing being started near-by.

Nothing prevents owners from inserting seedlings of valuable fruit, fodder- or pole-producing trees into a live-fence, at intervals of 3-5 m, for instance. In addition, live-fences provide fodder (leaves, pods) or fruit (Ziziphus, for instance).

The most encouraging aspect is that people seem to adopt the idea quite readily. A farmer from Arabsiyo presented himself to a project extension agent there, asking for plants to start a live fence like the one he has seen in Agabar!

## 3. Maintaining Soil Fertility

Although project efforts demonstrating various agroforestry techniques in the field are not much more than one year old, local gardeners already have noticed and shown interest in another advantage, trees introduced in connection with gardens, have. Species such as Sesbania, Leucaena, Casuarina and others, properly maintained (pruned or lopped) will enrich the soils near-by through their leaf litter. The added organic matter will help retain a better soil structure and increase the soil's waterholding capacity. In addition, their Nitrogen-fixing ability also might improve soil conditions. Properly spaced, they also will act as wind-breaks, an important consideration in many locations.

Introducing such species and showing how they can be incorporated into a field crop or garden operation, will have an important impact, especially if their introduction will be replicated by neighbors on their own initiative.

#### 4. Technical Impacts

Additional information dealing with the technical aspects of the project are covered in Annex 1 and 2. Only a brief review is presented here, dealing with the quality and performance of the technical impacts of the project:

Nurseries. The overall impression is very good. Especially the layout, overall planning and spatial arrangements are excellent. Pots and beds make a good impression as well. Care should be taken that pots are filled so that the free-end collar does not exceed 1 cm. Also shading should be experimented with to see how little (if any) really is needed. The use of "unused" space for trial and observation lines or plots of new, promising species is commendable. So is the installation of live-fencing. All project nurseries are becoming important focal points for dialogue and communication with people; an ideal setting to discuss, demonstrate and promote not only trees but more general forestry and conservation subjects.

Recommendation for new activities include:

- trying to obtain grafting material for improved ziziphus stock from Pakistan or India.
- install improved guava stock to be multiplied by layering.
- install "cutting orchards" of carefully selected local tamarix species (riverbank stabilization).
- experiment with the production of seedlings of more, local species such as Dobera glabra.

Plantation. An excellent start has been made in water- and soil-conservation efforts. Various, specific micro-site improvement techniques for trees have been tried. Work now can be branched out: try different shapes, dimensions of crescents or "Vees", or sub-divide entire slope surfaces into a series of connecting diamonds with ridges large enough to contain 70 mm of rain-runoff (without spilling).

Also experiment with various forms of physical contour treatments. Try rock-ridges where rocks are available. Earth ridges (bunds) are another alternate. Use standard formulas for dimension of ridges and their spacing. Also: experiment with different spacing (vary distance or vertical intervals between ridges), to fine-tune and determine the most effective layout. For immediate, local benefits, investigate potential for:

- grass cutting
- water harvesting (and -selling)
- pod- and fodder-collecting from trees/shrubs
- limited and controlled crop-raising at especially favorable locations.

Fruit Trees, Gardens. Experiment, demonstrate propagate applicable agroforestry techniques which has already begun. Especially live-fencing and borderline trees is catching on already. So is fruit-tree seedling production (see note on guava and ziziphus above).

Windbreaks for gardens as well for more general use can be stressed more. Place emphasis on multi-species in two or three lines. Spacing depends -- among a host of other things -- also on species. Casuarinas, for example should be spaced closer together than species that develop larger crowns. Note that this recommendation is exactly opposite to the conclusions reached in the SCF evaluation; it is based on experience gained in other windbreak projects in West Africa and is generally applicable if ecologic and economic value judgements are also taken into consideration.

Private Tree Seedling Production. Encourage local initiative. The main issue is to avoid giving seedlings away free! Someone will have to pay for them, one way or another, once the project in-puts end. Help set up local groups to start their own nursery business: fruit-, shade- or ornamental trees. Continue the good work that has been started conducting "feasibility studies": investigate market-potential, test-market, find out what sells well.

General. Place accent on how many trees will grow reasonably well and are properly cared for, rather than sheer numbers. Focus on those locations or situations where tree ownership and benefit-rights are clearly defined and accrue to those who made the original investment (compounds, gardens, private fields).

Survival. Among trees established around compounds, public places as well as farm field or gardens, survival is consistently over 75%. In the plantations the initial (3 week) survival was quite high and in about the same order. However, a long dry season is yet ahead for the trees and where they can not be watered or where no special site improvement efforts were made (like micro-catchments), survival counts at the end of the first year should not be expected to be over 40%, but it is really too early for an estimate of this kind.

## V. SHORTFALLS

### A. LOCAL CURRENCY FUNDING

Throughout the life of the project, transfer of local shillings generated from the sale of PL 480 commodities was sluggish and slow. The average delay between requests and funds received available to the project in Hargeisa, ranged between 2 and 3 months. The last payment, requested in September, appears to be especially tardy.

It also is apparent that the Somali Government is constantly and without advance notification changing the rules. To make sure the specified procedures were followed, the project sent one of their accountants to Mogadishu to learn about how things should be done according to the latest wishes of the Ministry of Finance. Soon afterwards, however, the project was advised that their submittal was not in concordance with a yet more recent change in procedures adopted by the Ministry and that therefore, subsequent payments would be held up until OEF - once again - changed their reporting system.

It is interesting to note that at the time of the evaluation, the complexity and extent of the way the Commodity Import Program funds have been held up is such that further transmittals (of enough local currency) to finish the project appear to be in serious jeopardy. It will be interesting to see how this rather unfortunate situation will eventually be resolved, if at all.

### B. CONSTRUCTION

Two office/lodging buildings (one per camp site) and an office/storage building were originally budgeted for. A series of delays has occurred and as a result none of the buildings have yet been started. If and when the local currency transfer of funds referred to above takes place, the buildings can be completed, provided additional inflation by then will not require further supplements, for which the money simply may no longer exist.

A first delay occurred when the office in charge of plans and specifications (at NRA) tried to charge an exorbitant fee for a standard set of building plans. The Project Manager then secured the services of a local architect to draw a separate set of plans. NRA then decided that the type of construction originally called for should be upgraded and building dimensions increased. This raised the price which had already increased considerably because of local inflation, running at approximately 50% per year.

On top of that, NRA decided to add, as a further construction item, a rock-wall around their Hargeisa nursery. Again, an increase in costs. If indeed such a wall will be built, this may be the only AID-financed nursery

in dryland Africa enclosed by a donor financed masonry wall.

As keen as NRA appears to be to get as much "infrastructure" as possible out of projects in general, it seems unrealistic for them to push this much and delay construction this long and still get all they want. In the meantime, the various housing problems which arose from the buildings not yet being ready, have been - at least temporarily - resolved. Other than to fulfill an original contractual obligation, the question of whether these buildings are really still needed, is now debatable.

#### C. LAND

"Readily available land" as the project paper indicated does not, as already mentioned, exist. The error made assuming that it is, has already been described. It also already has been pointed out that, per agreement, NRA had the primary responsibility to make land available. It should be pointed out that the one alternative site they have provided, a grazing reserve near Halaya, does not really meet the project's intention of community-orientation and participatory development.

#### D. THE STOVE COMPONENT

One component of the project covered training and introductory activities relating to improved stoves. Based on experience that has accumulated since the project's design, it is now questionable, whether these activities will have the hoped for benefits:

- Solid mud stoves as firewood saving devices have all but been abandoned elsewhere in Africa. As it turned out, they are simply not adopted or accepted by people for a number of generally good reasons. Most importantly, they do not save much, if any, wood, contrary to claims that have been made by some of the original promoters. VITA has adopted a much more cautious stand. Unless local acceptance is exceptionally favorable - and indications are that it is definitely not - these efforts should be discontinued immediately.
- In addition to the solid mud firewood model, a modified Haraka stove using charcoal has been introduced on a small scale trial basis. This particular model is described in "Recommendations for CARE/SOMALIA/UNICEF Stove Component of the village forestry project in Northwest Somalia" by J. Selker and L. Childers of the UNICEF Technology Support Services, East Africa Regional Office (1985). Its expected efficiency is claimed to be "twice that of traditional metal stoves." This particular design has been developed as a result of two-stage redesign efforts by VITA in Hargeisa. It is supposed to be exceptionally efficient, safe and available at a relatively low price. It costs more but appears to

last 12-24 months, or 50% longer than the traditional stoves.

However, according to several people with in-depth experience in Kenya, Rwanda and the Sudan, this particular model will save little if any fuel, unless a clay liner (similar to the one used in the Kengo model in Kenya) is added. CARE's Regional Forester in Nairobi is of the same opinion as I am: whatever other merits this model may have, it is incorrect to claim that it will use less fuel and therefore help reduce deforestation. The overall impact the project's stove component is having on reducing woodcutting, therefore, quite likely is ineligable: this component should be eliminated from future project activities.

#### E. AID and NRA Relationship

This subject has already been discussed in detail in chapter III. It is worth summarizing, however, why OEF's relationship in the eyes of AID and NRA may not have fulfilled their expectations.

Both AID and NRA tend to compare OEF's performance, its relationship with their Mogadishu offices, and its overall achievements with the other US PVOs under similar agreements. Three major differences exist, however, which people seem to sometimes forget:

- The OEF forestry project covers only a total of two years. All others are, or were, four-year projects. When comparing end-of-project accomplishments one must keep this in mind.

- Contrary to all other PVOs that carry out AID-sponsored forestry projects, OEF is the only one that does not have other program activities in Somalia. All others have full-scale country headquarters located in Mogadishu with a host of U.S. as well as Somali permanent staff, which handle other project activities aswell.

- The OEF forestry project is located in the Northwest of the country, further away than any of the others and requiring air travel between the project headquarters in Hargeisa and Mogadishu.

This remoteness from AID and NRA main offices and not having any other activities in-country does place OEF at a considerable disadvantage compared to the other PVOs. OEF's routine contact and relationship, especially with AID, are not and cannot be expected to be the same. At the same time, while other PVOs can use their Mogadishu office staff to expedite and short-circuit a number of important administrative activities and do the legwork which other parties of the agreement actually should be doing, OEF does not have the same broad, regular and continuing capacity. While it would be unfair to hold this against OEF, it is understandable that often, AID and NRA nevertheless expect the same "coverage." The only way this could be done is for OEF to set up an office of its own county representative, with staff in Mogadishu, as the others have. (Staffing needed for an OEF project in Baidoa will help.)

OEF's only error in this was that the project staff did not, from the beginning, insist hard and formally enough for a minimal contract compliances. To make an issue of it now is too late; Phase I comes to its end on December 17, 1986, and relationships, largely due to the shortfalls listed above, are such that a second phase would most likely run into exactly the same difficulties, unless a new and much more cooperative and supportive approach is used.

## VI. FUTURE PROSPECTS

### A. LESSONS LEARNED

In terms of lessons learned, the first recommendation which - under the circumstances - imposes itself is that OEF should seek funding from sources other than just AID. Secondly, SWDO seems to be a more logical, active and committed partner to people and participatory oriented conservation programs than NRA.

A further issue is the full organizational country representation of OEF in the nation's capital. This would necessitate, in addition to project staff located up-country, establishing formally, the office of an OEF country director.

### B. BASIC APPROACH TO FUTURE ACTIVITIES

Project experience has shown that OEF is on the right track focusing its resources on the forestry conservation sector:

- problems of resource degradation, not just trees, but soil and water resources as well are great in Somalia and increasing.
- a people-based, participatory approach can work here, and in the long run shows greater promise than centrally planned and executed, large-scale technical investment-heavy forestry and resource conservation interventions.
- women can play a very important role in conservation-oriented small-scale production activities in the rural areas of the Northwest (and probably elsewhere in Somalia.)
- very encouraging, basic, individual initiative and motivation exists in regard to tree planting and soil conservation in villages as well as in refugee camps. People will - on their own - undertake new ventures, try and adopt new technologies if they make sense. Local people have shown interest and personal initiative in trying to enhance and protect their environment without the need of extensive awareness campaigns. This presents an ideal opportunity for a PVO like OEF to continue to do the good work it has begun.

### C. UNCERTAIN EXTENSION-POTENTIAL

At present (13 December, 1986) the future of this project in terms of either a short-term extension or a longer Phase II continuation is highly uncertain. The only sure statement that can be made is that OEF's Agreement and with it its role as project implementing agency ends on December 31, 1986.

Approval or rejection of several requests for continuation submitted to AID presently are pending (and have been for a number of months):

- 1) A four month extension including some supplemental funding,
- 2) A continuation of project activities to cover a second, two-year phase.

The extension has recently been approved by NRA and - conditionally - by AID. It seems that AID will actually grant the extension only if the Ministry of Finance (in addition to NRA, which according to the terms of the Agreement is acting "on behalf of the Somali Government!") signs it as well. Finance in turn, has recently decided that it will not approve this extension until there has been another evaluation, which AID now has scheduled for Spring of 1987. Finance has recently rejected an evaluation of the project that has been conducted by a local consultant for the Ministry of Interior. The very latest news (December 17) is that the Ministry of Plan will evaluate the project; then if the Ministry of Finance agrees, AID will release the dollar funds.

The other request for funding of a second, two year phase is less certain, yet. CDA funds are no longer available and judging from a few brief meetings with AID/Somalia, it seems highly unlikely that AID will or can commit Refugee Resettlement funds to finance the entire cost of a second phase.

### D. IF THE PROJECT ENDS NOW

In a worst-scene scenario, the project would come to its contractually specified end in another two weeks. Much of the momentum gained of course, would be lost. The upshot would be that a two-year forestry project without any follow-up, will only have a series of good start-up activities to show for. That is, if OEF indeed is forced now to close-out project activities altogether.

## E. POSSIBILITIES FOR CONTINUATION

Fortunately there are a number of other possibilities, although none yet certain to assure continuation:

- 1) Several other donors have expressed interest in funding part of future project efforts. UNHCR is a potential funding source.
- 2) Others have made some initial inquiries that would involve at least part of the present project's extension and training capabilities and components. (CARE, for instance, in connection with their forestry project in the northwest, not funded by AID)
- 3) Other (third-country) donors will be contacted by the project staff to explore possibilities of co-funding along the lines of efforts developed thus far.

OEF is in the enviable position of being the only foreign donor organization in the Northwest Region that can offer a ready-to-go extension and training structure in the forestry/resource conservation sector. This could be of interest also to other rural development projects s.a. the Worldbank's Northwest Agricultural Development Project. Contacts have been established with the intent to further explore possibilities and options of including extension and conservation activities in the IBRD project.

## F. SOME DESIGN GUIDELINES FOR THE FUTURE

Future efforts, either as second-phase activities of the project that has now come to an end, or in the form of a different and new project, should be based on the experience gained thus far and focus on the following:

- Place accent on restoration and conservation of all natural resources (land, water, vegetation), not just trees or forests/woodlots.
- Conservation, restoration, protection of land, water and vegetation will only "make sense" to local people if tangible results can be achieved relatively soon after the original investments have been made. This requires that efforts should include and heavily rely on such production benefits as:
  - fruit trees
  - grass-cutting
  - beekeeping (honey production)
  - business-oriented, private seeding (nursery) production
  - surface water management (diversion, storage, selling)
  - crop production (castorbeans, pigeon peas, for instance), or small-scale cereal production on restored land

In other words: no conservation without concern for production.

- Provide managerial training and a statutory framework for women to use their talents and initiative in private enterprise s.a. production of seedlings, fodder, honey, managing their own water resources, etc., Provide opportunities for them to work also as extension agents concentrating on local women-clients.
- As a new concept, experiment with and develop a use-system (based on sustainable management practices) dealing with the management of natural vegetation on a multi-purpose basis: pasture, fuelwood, poles, other forest and bush products.
- Place accent on "agroforestry" in its widest sense. Advocate establishing trees wherever they are not in the way of other resource-utilization systems (farming, gardening, e.g.). What counts are the number of trees dispersed in the landscape, not hectares or number of trees planted and managed as forests or woodlots. Highest survival and best care of trees occur where their ownership-status is clearly defined. That is where more should be introduced, planted and grown. Shade tree, live-fencing fruit trees, wind-breaks, borderline trees, trees planted along roads, trails, or waterways, in small groups or clumps, or in connection with soil-conservation efforts (bunds, for example), are all "agroforestry techniques", whose applicability and acceptance should be tried, tested, and adjusted to local needs and adoption criteria.
- Future project management and extension education systems should be based on local people: training, leading, talking to their neighbors, friends, relatives, etc. The main thrust of project efforts should be carried out by the local people themselves; this a prerequisite for a local, spontaneous "movements" to develop. Government and outside technical assistance are not eliminated. To the contrary: their inputs are needed to provide the overall framework. Activities such as planning, prioritizing, R & D, or training development cannot be done on a village level. An effective partnership needs to be formed where all involved have their specific and well defined role. This implies judicious and carefully balanced distribution of available funds, time, and other inputs.

#### G. IMPLEMENTATION OPTIONS

Conceived and implemented along these general lines, future forestry/conservation program activities have almost unlimited potential in this region.

- Forestry or conservation modules can, for instance, be "packaged" and offered to different donors for funding for one or more of the

other refugee settlements in the region, or

-Conservation or "Biologic" components can be designed and attached to or "piggy-backed" onto larger, more "physical" rural development projects, particularly, if a people-oriented, participatory approach as outlined above is used.

-Specific resource restoration projects, focusing on sections of land that have been particularly degraded, can be set up as "public work-type" efforts, specifically with women (or refugees) in mind. Such projects could provide work (income) to those segments of the population, needing assistance the most. In good years and/or during the farming season, these project-sites could be operated at a reduced level to be opened up when adverse conditions begin to appear. (Droughts for instance). This would guarantee a minimal income (instead of relief), and at the same time restore land, water, and vegetation resources which then could be managed on a participatory basis through the introduction of a management model containing local associations and government agency interests that make more sense to local residents than top-down oriented "management" schemes. Food-aid could be incorporated in this type of project; "food for conservation", rather than food-for-work would be one of the options.

#### H. A CASE FOR CONTINUATION

Although the hope for a second phase of this project to occur has been expressed already in the Project Paper by its very title, "CDA Forestry Project Phase I (OEF)", the agreement clearly limits AID's and NRA's commitment to 24 months which come to an end on Dec. 31, 1986. No legally binding obligations exist to fund the project past this date. On the other hand, it is self-evident that forestry conservation efforts, in order to adequately recover any initial investment, should be carried over a longer period than just two years. While administrative or political priorities may now have been moved to other sectors, it does make sense to advocate the continuation of efforts in this particular one, especially since the initial work has been as successful and as impressive as in this case. Africa-wide track records of forestry projects is not all that great, especially not for larger, top-down conceived and implemented ones. If one has had as much initial success as this one, it would make sense to seek the means in order for it to continue, at least for another two years. Successful forestry projects - as experience elsewhere in Africa has shown - will rarely become completely self-supporting and independent from outside help in less than 10 years. Providing funds for a second phase would at least ensure that a solid and good basis could be built, upon which a multi-donor, long-range effort could then be developed. As pointed out already under "Overall Project Impact", initial inquiries from other sources to this effect already have been received. A modest and limited

OEF PROJECT STATISTICS  
OCTOBER 1, 1986  
BY SCOTT J. LEWIS

HARGEISA

1. Urban forestry program instituted
2. Nursery production:
  - a. NRA nursery-35,000 seedlings(3,000 p/days)
  - b. Three SWDO village nurseries-7000 seedlings

ARABSIYO

1. EMPLOYMENT: 35,000 person-days provided
2. Training: Extensive training provided to staff and local community members in forestry skills, community development, and non-formal education.
3. Nursery Production: 100,000 trees produced.
4. National Reforestation: 40 hectares completed plus an additional 50 hectares under development
5. Amenity Plantings: 23,100 trees distributed (refugee camps/villages)
6. On-Farm Plantings: 33,000 trees distributed(fruit trees,windbreaks, live fencing, intercropping in gardens etc.,
7. Community Agroforestry: 8 ha. site under development.(Agroforestry)

AGAEAR

1. Employment: 18 000 person-days provided.
2. Training: Extensive Training provided to staff and local community members in forestry skills, community development, and non-formal education.
3. Nursery Production: 80,000 trees produced.

4. Amenity Plantings: 22,600 trees distributed.
5. On-Farm Plantings: 17,000 trees distributed.
6. Community Woodlots: 20 hectares planted.

HALAYA

1. Grazing/forest reserve: 25 kilometers of shelterbelt plantings established within 2200 ha. NRA reserve. 4000 person days provided.

TOTAL SEEDLING PRODUCTION TO DATE: 272,000 SEEDLINGS

**SEEDLING PRODUCTION COST ANALYSIS  
26 JUNE NURSERY**

This analysis is based on the assumed production of 5000 seedlings over a 3 month period.

Materials		SoSh.
Plastic pots-5000 0.5/pot	=	2500/-
Pot transport from Jamame 30/kg x 20/kg of pots	=	600/-
Water 2000/month x3	=	6000/-
Soil mix (9m <sup>3</sup> total) manure(3m <sup>3</sup> )	=	1000/-
sand + soil (6m <sup>3</sup> )	=	1000/-
Pesticide	=	200/-
Total material cost	=	11,300/-
LABOR - All nursery operations 3 people 2000/month x 3	=	18,000/-

Total cost = 29,300

10% contingencies = 2,930

Total Cost = 32,230/-

Cost per seedling= 6.5 SoSh

SUMMARY AND DISCUSSION OF OEF FIELD FORESTRY ACTIVITIES  
November 23, 1986  
By Scott J. Lewis

I. ARABSIYO

CORE FORESTRY TARGETS:

100 hectares NRA block plantation  
20 hectares community woodlot  
40 kilometers shelterbelts/windbreaks  
23,350 amenity trees

TARGET STATUS AND DISCUSSION

a. 100 hectares NRA block plantation

To date 40 hectares have been obtained by the project. Additional land thus far has not been made available to the project by the NRA. The project does not consider this a plantation, but rather a soil conservation and forest/range rehabilitation and recovery area. Due to the severe gully erosion and low site quality, we decided an alternative approach (to the usual NRA tree planting efforts) was warranted. Four main objectives can be identified:

1. Site protection—The site has been fenced and guarded against use by animals and woodcutters. This will allow natural regenerative processes to proceed. Even after only 17 months project personnel can see a difference in the site. Significant numbers of woody perennials exist on the site and they are now able to grow without animal and human pressure. A vegetative survey was undertaken at the beginning of the project, and an identical survey (tree/shrub numbers, ground cover percent) will be taken at the end to document changes in vegetation.

A symbolic rather than strictly functional fence was used, with only 2 strands of barb wire and fence poles harvested from branches of local acacias. Use of local materials was decided upon in order to increase replicability by NRA. A hedge of trees has been planted along the fence boundary to function as a live fence. When functional, the barb wire fence will be removed.

2. Soil conservation—Bunding has been undertaken along contours and within small gulleys (large gulleys concentrate too much water for soil bunds to hold the water without breaking). These have been very effective in trapping water and slowing down water flow, with a resulting decrease in

SEEDLING PRODUCTION NUMBERS  
BY SCOTT J. LEWIS

In the original proposal seedling production was to be allocated as follows:

1. 200 ha block plantation @ 3x3 m spacing: 222,200 trees.
2. 40 ha community woodlot @ 3x3 m spacing: 44,440 trees.
3. 80 kilometers windbreaks/shelterbelts: 150,000 trees. (This was identified in the cooperative agreement as 80 kilometers of shelterbelts and windbreaks, with no specified number of trees to be planted per kilometer. At 160,000 trees as stated in the proposal this works out to 2000 trees per hectare, which could be expressed as 6 rows of trees spaced at 3x3 m between trees).
4. Amenity plantings: 47,000

The proposal stated that total production was to be 580,000 trees, but when each component of production is summed, the total is 473,640 trees.

Based on silvicultural decisions alone these targets were altered as far as the project was concerned just by changing the spacing chosen for certain of the trees planting components. This worked out as follows.

1. Block Plantations:

**Arabsiyo 100 ha. planting:** spacing changed to 4.5 to 5.0 meter spacing between trees, which works out to between 400 to 494 trees per hectare. If we take an average of 450 trees per hectare to be planted, we come up with 45,000 trees needed for this component. This is thus a reduction of 66,100 trees needed. The decision to plant a live fence required the addition of 4000 more trees, resulting in a total requirement of 49,000 trees.

**Agabar 100 ha. planting:** Same as Arabsiyo

**Total block population seedling requirement:** 98,000 trees

2. **Community woodlots:** Based on the same silvicultural decisions as above (which is logical given the same site conditions) the total tree requirement would be 9000 trees for each 20 ha. woodlot, plus 1800 for each live fence (assuming these are 20 ha. blocks), resulting in a total for each unit of 10,800 trees.

**Total community woodlot requirement ; 21,600 trees**

3. Shelterbelts/windbreaks: Given the semi-arid conditions a 6 row shelterbelt or windbreak is not technically sound. Those farmers who could provide supplement irrigation typically have small garden plots and do not have the room to devote 6 row to trees. Dry land farmers have the room but don't have the water nor the protection against animals to establish such plantings. At the most we could consider a target of 1000 trees per kilometer as being somewhat feasible, which would give a seedling requirement of 80,000 trees.

4. Amenity plantings: This target needs no modification for technical reasons. 47,000 trees required

The sum total of these seedling needs based on silvicultural modifications of project design is thus 246,600 seedlings required to fulfill project seedling production targets under the original planting categories.

The following itemization shows how seedling production worked out in practice as a result of land constraints and the addition of new sites to the project (again due to lack of available land)

1. Block plantations and community woodlots:

Arabsiyo: 40 hectares @ 450/ha=18,000 + 2530 for live fence=20,530

Agabar: 20 hectares @ 625/ha=12,500 + 1800 for live fence=14,300

**TOTAL= 34,830 trees**

2. Shelterbelts/windbreaks: This category was broadened to include what we are calling on-farm plantings, whether for shelter or wind protection, live fence, small woodlot production, agroforestry, shade, or fruit production.

The total number of trees distributed to farms from all nurseries is 50,000

3. Amenity plantings: Total amenity tree distribution can be itemized as follows:

Arasiyo-23,100

Agabar-22,600

Hargeisa-35,000

---

**Total= 80,700**

**4. Halaya Grazing Reserve:** 25 kilometers of shelterbelts have been planted along the bunded areas in this 2200 ha. grazing reserve. Two rows @ 3x3 m spacing required 666 trees/kilometer yielding a total production requirement of: 16,650 trees.

**TOTAL ALL SITES = 182,180 TREES DISTRIBUTED**

As of October 1st there was an approximate inventory of seedlings on all four project nurseries of 90,000 seedlings. These seedlings are still going out of the nurseries, and the distribution figures will increase accordingly. This inventory figure includes some recently sown fruit trees and live species. In addition, there are approximately 10,000 to 20,000 trees which will likely be culled from the nursery beds due to poor vigor, damaged nursery bags, lack of demand, and lack of available land for outplanting.

**TOTAL SEEDLING PRODUCTION TO DATE: 272,000 TREES**

sheet erosion. Small rock check dams have also been placed along some small gulleys and contour lines. Rock wall or gabion construction is being considered for use for soil conservation if the project is extended into 1987. Trees have been planted in front of and behind the bunds.

3. **Planting of woody perennials:** Tree planting and some planting of shrub species (eg.-Atriplex) has been undertaken to stabilize exposed slopes and increase stocking density of the site, which already has significant numbers of Acacia etbaica trees existing, although these were mostly cut and browsed back to a level of less than 50 cm. These are now recovering from the previous extreme utilization pressures.

From the inception of work at this site tree planting was approached as a conservation measure rather than a purely production oriented activity (although certainly wood yields are expected ultimately). The silvicultural prescription was to plant trees at an approximate spacing of 5 by 5 meters (400 trees per hectare), and if a planting spot was already occupied by another shrub or tree to skip that spot. Even at this reduced density, labor inputs were significant due to the high bulk density of the soil which only allowed 10 to 15 holes per man day to be dug. A standard plantation spacing would have made labor inputs for hole planting prohibitively expensive.

**Survival:** Tree planting started at this site in the few months before the Spring 1986 rains, and then continued throughout the 1986 rainy period. Those seedlings planted before the rains began (beginning November 1985) were given supplemental handwatering (on a schedule of decreasing frequency and constant volume) until rains began. Subsequent to the arrival of the rains no watering has been undertaken except for trees planted along fence lines for the live hedge/fence. A survival course will be undertaken in early December. Observation surveys have indicated that those seedlings planted and watered before the rains have much higher survival and growth rates than those trees planted with the spring 1986 rains.

Severe hare damage to Parkinsonia aculeata has practically eliminated this tree as a feasible species to introduce to these sort of sites. Although the tree survives the initial severe browsing, repeated clipping of the trees by hares once the dry season arrives may ultimately kill some of these trees. At best, a whole season's growth has been lost. Those trees near to watchman stations suffered less damage, and grew very well. Prosopis spp have had only minimal hare damage.

4. **Water harvesting:** Experimental water harvesting has been undertaken at this site. Results to date have been very encouraging. Refugee laborers dug catchment pits (from 2 to 5 meters deep and 3 to 5 meters wide) adjacent to water courses which flow during a rain. By making a small earth diversion across these waterways significant volumes of runoff have been captured. Our largest catchment (capacity of about 400

drums (80,000 liters) filled after a rain of only 15 mm. The value of the water collected from the one storm (at delivered Arabsiyo rates) was 20,000 Somali shillings (\$240). The project has subsequently dug another catchment pit just below this first one and linked the two by means of a shallow canal, so that overflow water can be harvested. One could connect in series additional catchments to increase harvesting. The first pit can then function as a settling pond for the sediment load. The clay subsoil at this site has turned out to be ideal for retaining the water harvested. Sedimentation has thus far been far below that expected.

Project personnel feel there is great potential for further water harvesting on these sorts of sites. One significant benefit of these water harvest points is that once grazing is reintroduced on a controlled basis, livestock watering points will already exist. To date 6 water harvesting catchments have been constructed on this site.

b. 20 hectares community woodlot

The project has not developed any component to date which can be truly called a community woodlot. Again the issue of obtaining 20 hectares is a major problem. Furthermore, there has been little interest by the Arabsiyo community (through the steering committee) in such a concept. Despite the presence of the Arabsiyo refugee camp (a relatively small camp), fuelwood and charcoal are still relatively plentiful locally. Certainly if 20 hectares could have been obtained for this purpose, the community would have been happy to work in such a project for money, but the result would not have been a true community woodlot, but rather a project woodlot using hired local labor.

What the project has attempted to do in place of the woodlot, is to start a community based (but not communal) agroforestry component. This has been essentially conceived as an income generating horticultural/gardening project in which trees play an important role. Contrary to our experience with the concept of a community woodlot, there has been considerable local interest in such an idea, and we have found that local women are willing to work for free (i.e. in their own self interest) if the project can develop the water resource and obtain the land.

Land, once again, was a significant problem, and project personnel spent an inordinant amount of time over a one year period negotiating for the land. Eight hectares was obtained, of which 1 ha. is being developed into an income generating agroforestry plot by the local SWDO. An additional 1 ha has been divided into 20 x 20 meter plots for refugee women. Plot boundaries are being planted by the women with the forage variety ("Peru") of Leucaena leucocephaea at 80 cm spacing between trees to form a live hedge which can be continually cropped for forage. Additionally, approximately 12 agroforestry trees per plot will be planted and intercropped with the vegetables.

Approximately 6 hectares remain to be utilized in this community effort. Options range from communally managing the indigenous vegetation to establishing a woodlot on a portion of the site.

The water resource is being funded through money received from New TransCentury Foundation. Depending on the amount of water available additional plots may be allocated to other people.

c. 40 kilometers shelterbelts/windbreaks

This target was established within the overall CDA Forestry framework without any real technical indications or specifications (or thought?) of how it was to be implemented. A consideration of the specifics of implementation immediately lead one to several serious problems.

The shelterbelts must be planted on private land since there is not any real public land which could be devoted (and protected) for such a purpose. This means that an extension effort dealing with private landowners or land claimers is required. Two main categories of identifiable private non-grazing land exist in the Northwest Region:

- 1) dryland farms
- 2) irrigated farms adjacent to the dry watercourses.

Shelterbelts are desperately needed in the dryland agricultural areas since little natural vegetation remains which could fulfill such a function, particularly west of Arabsiyo, where extensive areas lie completely exposed to wind erosion with virtually no trees in sight. Two immediate problems to planting shelterbelts in such areas are protection from animals and tree establishment. Obviously such strips can't be fenced off, and animals are put in the adjacent fields for grazing the sorghum stubble after harvest (thus having ready access to newly planted trees). Thus the farmers would have to maintain strict animal control to prevent damage. The problem of establishment is even more limiting. These would have to be entirely rainfed plantings, and the state of the art of dryland tree planting in Somalia is such that we would be fooling ourselves if we felt confident in mounting a large scale extension effort to motivate farmers to plant extensive shelterbelts in such areas. We have not demonstrated the technology as yet (witness the poor survival records of plantations in Somalia - even with the supplemental irrigation), and would lose considerable credibility if we instituted a large scale failure. Not only do we not know what sort of spacing to utilize (nor how many rows), we don't even know which species can be planted with a reasonable chance of survival. It is clear, however, that many of the classic species for use in shelterbelts and windbreaks, such as Casuarina spp., Cassia siamea, Eucalyptus spp., and Azadirachta indica appear to be too water demanding to be successfully planted under the low precipitation and deep water table conditions in Northern Somalia. Probably the most promising species is Prosopis juliflora just based on survival characteristics alone. It also is of limited palatability, which would tend to minimize animal damage.

Unfortunately, the most favorable species from a survival standpoint isn't the best choice from a purely functional standpoint-i.e., how well it functions in intercepting and reducing prevailing winds. This is not surprising from a biological standpoint, since leaf area is directly proportional to precipitation. The less rainfall the less leaf area, and thus the less wind interception. Still some wind protection is to be gained from establishing even Proposis, to say nothing of the utilization benefits (pods, fuelwood, rough poles). One possibility would be to use Prosopis and a shrub (such as Atriplex or a suitable indigenous species) together, with the shrub species filling the holes below the Prosopis canopy. Clearly, some research trials are needed before we can confidently (and responsibly) promote shelterbelts in dryland areas. For these reasons, the project felt it was best not to mount an extension effort at this time. The project is planning, however, to institute several small trials during 1987 in these dryland areas.

The irrigated farming areas offered much greater possibilities for protection plantings, and our extension efforts have concentrated on these farmers. Typically, many of these farmers can be considered cash crop vegetable gardeners, rather than subsistence farmers. Plots are much smaller than dryland areas, and considerable investment is made in these plots in water development and horticulture. Typically, such farmers are already growing trees on their own, although most of these trees are fruit trees. Our extension agents have found that there is little interest in planting shelterbelts or windbreaks by the farmers. They already have a certain level of wind protection (for their vegetables) from their fruit trees (although we know that fruit production can be increased with proper protection from wind). Not surprisingly, the farmers have expressed continued interest in obtaining fruit trees from the project, and little interest in other species of trees. To get our foot in the door, so to speak, the project has responded to the farmers requests and produced many thousands of fruit trees (papayas, guavas, zizyphus, and mangos). At the same time we have identified what we believe is probably the most favorable avenue of promoting the use of other tree species on these farms by pointing out the extreme waste of the farmers time and energy by continually constructing dead thorn fences to demarcate and protect these plots. We are thus promoting the use of live fences or hedges to take the place of the traditional thorn fence. Although acceptance has been slow, the farmers are becoming more interested now that they are seeing what the advantages are.

Several demonstration hedges are currently being established by the project Arabsiyo, and we expect that the use of live trees for hedges will greatly increase during 1987 as the demonstration effect has a chance to work. By letting trees grow up every 4 meters or so (and pruning the rest) a combination hedge and shelterbelt can be established. Although more water demanding species could be utilized on these lands, the farmers are reluctant to make the investment, since irrigation of these trees requires extra work and fuel for their pumps. Thus Parkinsonia and Prosopis still

look like good choices for these live fences. In the areas that do not need the thorns to discourage livestock entry and the farmer is willing to make an extra investment in water, a closely spaced hedge of the forage variety of Luecaena could be significant producer of forage. Harvesting could be undertaken in the dry season when most needed.

Some farmers are experimenting with agroforestry species intercropped with their garden crops, modeled after our agroforestry demonstration plot. Leucaena, Sesbania, and Cajanus cajan have all been introduced successfully on a project demonstration plot, and will soon yield detailed harvest results which can be communicated to the farmers.

The shelterbelt/windbreak target category, as described above, has been considered by the project as tree planting on farms, although we have never prepared any formal PIL to USAID or NRA formally requesting such an alteration of target category. We have expressed the on-farm tree planting as simply numbers of trees planted on farms (for all purposes), rather than kilometers of shelterbelts and windbreaks, which has never had any real technical basis for establishment here in the north. Total tree distribution to farms is approximately 33,000 trees. Fruit tree survival has been very high, because the trees are highly valued. Other species have not been cared for as much, although we have not done a formal survey as yet.

The project is considering charging for fruit from the nursery (or helping a community group go into the fruit tree business). One option would be to provide free fruit trees to those farmers who also take and plant (and care for) other useful trees for their farms.

#### d. 23,500 amenity trees

No problems here. The Arabsiyo nursery has turned into a regional nursery of sorts, with seedlings being distributed for hundreds of kilometers - collected by interested people and other agencies listed in the main text in the section on "targets".

## II. AGABAR

The targets for Agabar are the same as Arabsiyo, and the rationales are similar. 20 hectares have been planted towards the reforestation target. Spacing was 4x4 meters due to the lack of other competing vegetation. 8 meter strips have been left every 40 meters or so for bund construction to capture runoff. These bunds will be planted once constructed. The land was only obtained very late this planting season, because approximately 15 other hectares were lost to the project which had been previously allocated by the camp commander, and which the project had planned to work on first.

The live fence program has been very successful thus far, with farmers coming to the nursery in increasing numbers to collect trees.

### Preferred firewood species

Information collected during the baseline study as well as additional spot checks at the various sites, reveal the following:

Arabsiyo-In the refugee camp 50% of the people said that they collected the first species available, while 50% said they search for a preferred species, which were either Acacia etbaica or Acacia bussei. Considering the availability of species around the camp I really consider these two answers pretty much the same, because the first species one would likely come across would probably be one of these anyway - especially A. etbaica. Almost all villagers said they collected the first species available. A. tortilis, bussei, and etbaica are apparently the species used most for charcoal. I have one report that etbaica is inferior to the other two due to excessive smoke when burned.

Agabar-In Agabar camp Acacia bussei was universally preferred as the fuelwood of choice. Like Arabsiyo, half said they take the first tree available, while half said they search for the preferred species. Given the much greater distance involved in wood collection at Agabar, I find this answer quite surprising unless the first species encountered was typically the preferred species.

### Species performance measurements

Although trees have been planted only recently, measuring their growth and production has begun. The first results are shown here:

We've started the measurement and coppicing of the agroforestry demonstration plot at Arabsiyo (the one adjacent to the nursery). The average height and diameter of 18 Sesbania grandiflora trees 6 months after planting was 3.11 meters and 27.2 mm respectively. Not too bad for 6 months growth. These trees were all from one row spaced at 1 meter between trees in the row and 4 meters between rows. At the same time there are vegetable yields to be tailed also, although the staff may have collected some of the produce before it was officially harvested.

Biomass yield for a smaller than average tree (height 2.5 meters; diam 15mm) that was coppiced as follows:

leaves-450 grams  
branches-610 grams  
stem-700 grams  
total=1760 grams

These figures are all green weights taken just after harvesting. We've tried feeding leaves to sheep and goats in Arabsiyo. They eat it, but weren't overly enthusiastic about it, although they were very fat animals - not particularly hungry. I gave some leaves to my watchman in Hargeisa to try out, and he said the goats really liked them and rapidly eat the leaves. Generally the livestock in Hargeisa are probably hungrier than those around Arabsiyo. We'll try some more systematic testing later.

ANNEX 5  
PHOTOGRAPHS



NURSERY LAY-OUT

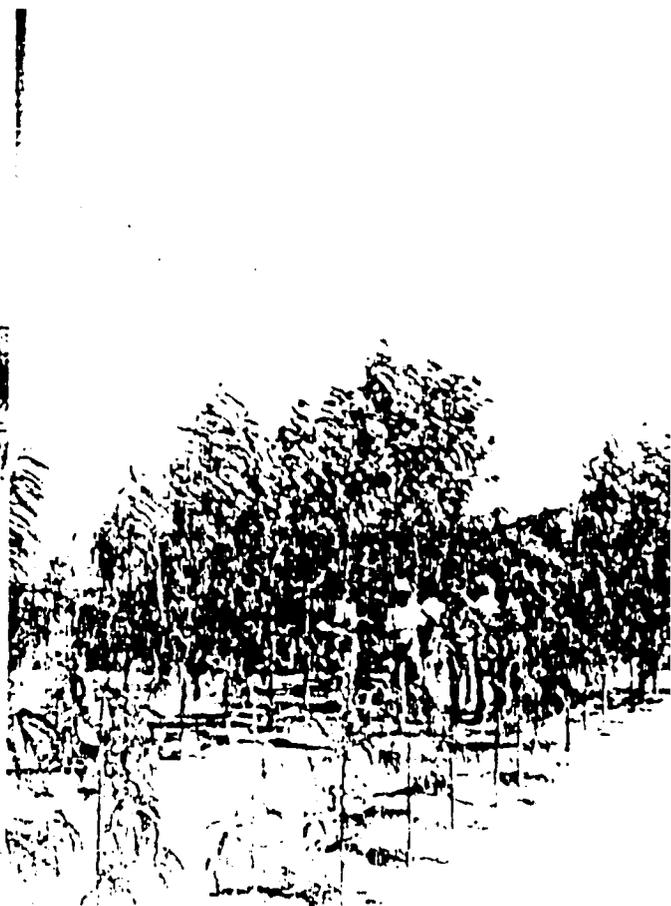


Performance of different tree-species  
is recorded in plots near nursery.

ARABSIYO



One year old live-fence,  
ready to prune.



Species trials

Effort by an individual  
farmer. Nursery-grown  
seedlings planted for a  
live-fence.

Camp (and nursery) in  
background.





First step at planting site: Construct horizontal ridges. Poor soils, little natural vegetation cover.



Trees planted along ridges last rainy season. Some natural reproduction from stumps.



Performance and spacing trials. Tall trees in foreground are sesbanias. Note natural vegetation in background.



Planting site. A prosopis grows upstreams of an earth ridge.



Another live-fence being installed  
around a farmer's field.



Planting site. Small individual catch-  
ments were built for each seedling planted.



Each camp compound contains at least one tree that has been transplanted from nursery.



Young seedlings growing in yard of camp office.

AGABAR



Nursery



Nursery. Note  
trial plots in  
foreground.



Trials in  
foreground  
and live-  
fence.