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COVER SHEET
FOR FIRST DRAFT OF THE
PVO/DEVELOPMENT INITIATIVES PROJECT AND SUB-PROJECTS

The reader is cautioned that the present draft is only preliminary. All of the subprojects were reviewed by their respective chiefs of party except for ACDI and KIM. These have been submitted for their comment regarding accuracy. Spellcheck may not have been done in all instances. Yet to come are three maps, a couple of tables, tables of contents etc.

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PVO Development Initiatives Project
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Introduction

The evaluation of the PVO Development Initiatives Project [DIP] looks at four issues. First, the overall performance of the sub-projects. Will the DIP accomplish its long-term objectives? Secondly, what elements among the various sub-projects can be sustained and what additional support will be needed to secure these accomplishments? Thirdly, an attempt will be made to account for particular instances where achievement has been less than targeted. Finally, it will look into the effectiveness of the umbrella mechanism, under which the cluster of PVO implemented sub-projects have been launched, with a view to coordinate implementation and accomplish the programs objectives.

A final concern addressed in the present evaluation is the sort of linkages which may be usefully included with regard to the AMTT and ATPRP project and program.

Evaluation of a management[?] inescapably calls for judgements to be made. These will be attempted through the use of clearly defined criteria.

I

A. Background:

A mid-term evaluation of the umbrella project and its six sub-projects was called for in the implementation plan. At the outset of the project it was assumed that the six components would begin at roughly the same time, 1990, such that by mid-1992, the expected date of the evaluation, the six would be in a comparable state of development - a mid point or a bit after. As such the evaluation findings would be of use to project management in making particular determinations regarding the desirability for project completion as planned, a redesign, a funded or non-funded extension, a termination etc.

This expectation has not in fact been realized in an important measure due to events beyond project or ~~even~~ mission control. The overall assumption was made that the political context would remain stable and that events disturbing to project implementation would not occur - this assumption has not been the reality. Domestic unrest occurred early in the LOP and this has caused

postponements affecting particular projects ever since. Where a project plan was closely linking to the cropping cycle delays of up to a year have occurred. As a result some projects are on schedule [VITA] and others as much as a year behind [ACDI]. In certain instances, and for differing reasons, project extensions have been called for. The AFRICARE team located in the Abeche area has been evacuated at least once and the project in fact only began in early 1992. Local unrest in the areas north of Lake Chad have caused first, suspension of activities [1990-91] and, later, led to evacuations of teams [1992], then abandonment of project sites [ORT and CARE] at the end of 1992. In these instances what was to have been a mid-term evaluation has become in practice a final evaluation.

It is important to bear in mind as well that all of the sub-projects were not born equal. Some, such as the VITA credit project is the third in a series dating back to 1984, and its current success is built on a firm foundation of practical experience. Others, such as the ACDI project south of Lake Chad is by definition experimental and pilot in nature. Under the best of circumstances false starts and unexpected findings can be counted on to influence implementation. Too, project time tables count on full staffs being in place by a certain time - in practice it has been found difficult to find suitable candidates for positions often located in difficult physical and geographic circumstances. All of these caveats taken together explain a ~~fleet~~^{series} of sub-projects in serious ~~disarray~~^{disarray} with regard to their original timetables. *design*
diff. r. a. n. v. j.

Purpose of the Evaluation

The Scope of Work underlying the evaluation of the PVO Development Initiatives Project [DIP] is necessarily a complicated one and calls upon the evaluators to: [1] measure the progress to date in achieving the projects and sub-projects outputs and purposes, [2] the appropriateness and effectiveness of the interventions undertaken by the PVO's, [3] the validity of the underlying assumptions, [4] the provision and quality of inputs supplied by the PVO's, [5] the role of the GOC, [6] the management and role of the USAID, [7] recommendations if necessary of the structure of the project[s] as outlined in the logical framework, and [8] the linkage of the DIP with the newly launched AMTT and shortly to be launched ATPRP [including non-project activities]. Gender concerns are addressed as well. These objectives are ones conventionally reviewed in the course of an evaluation but are essentially backward looking - asking where we are today and why?

This evaluation reflects a scope of work prepared by the USAID/Chad which calls for the following. First, an appraisal of the umbrella mode of project management and its relevance and effectiveness in the present project. A determination will be made as to the utility of the approach. Second, each of six sub-projects will be examined with the long view in mind: can the project strategy succeed in accomplishing the project's purpose and goal or, failing this, can it or can it not be done using some alternative strategy? In each particular instance the project will be examined in terms of its present status with respect to its end-of-project purpose and its strategy, state of progress with respect to remaining time, levels and composition of inputs, expected outputs etc. Very important the assumptions underlying each sub-project's will be examined for their continued relevance, or realism in the context with the conditions prevailing in the country.

The analysis having been done, each evaluation then will look beyond the EOPS to the sub-project's long-term goal and ask the question can the objective be reached from that prevailing at EOPS and, where the response is yes, how? The evaluation will only exceptionally make a particular recommendation - rather, it will present options each with its respective pluses, minuses and trade-offs for the Mission management to use in making its program decisions.

Methodology and Approach

The evaluation is based upon a mix of sources. Interviews will be held with chiefs of party and technical persons and Chadian counterparts and staff assigned to the projects. The respective quarterly report series were read in addition to the original and amended project papers, any earlier evaluations, technical studies produced by the particular projects etc. Relevant Mission staff have been interviewed. Finally, the evaluation team will make site visits to each project, talk with the persons - Chadian and expatriate - actually engaged in the implementation, beneficiaries, groupements, cooperatives, women's groups etc.

Particular attention will be paid to the technical approaches being attempted under the projects and especially those utilized by the 'pilot' projects.

C: Project Background

USAID/Chad's PVO Development Initiatives project was authorized in June 7, 1985 as a four year US\$12,725,000

activity with a PACD of September 30, 1989. The project's purpose was to:

Assist small-farmer food production and supportive private sector activities having demonstration and institutional development effects.

Initially four projects were implemented:

<u>PVO</u>	<u>Sub-Project Title</u>	<u>US\$</u>	<u>Total Funding</u>	<u>PACD</u>
CARE	Irrigated Agriculture Development		4,042,600	4/30/90
ORT	Lake Chad Agricultural Development & Farmer Training		2,592,800	7/31/91
VITA	Private Enterprise Promotion		1,287,100	6/30/90
Africare	Ouaddai Rural Development		2,967,700	9/30/90

Final evaluations of these sub-projects indicated they had substantially improved the food security of the target areas with the introduction of various production-enhancing technologies. Although much remains to be done to increase yields, quality and timing of harvest of high value crops encouraged under these projects it was believed that certain marketing constraints inhibited farmers ability to exploit fully the admittedly limited final markets found in towns and cities in the country and these should be addressed in the next phase.

The focus of follow-on projects was consequently shifted from an emphasis on production to marketing - including improvement in quality, post-harvest processing and storage, and market efficiency. These concerns are reflected in the six projects implemented under the umbrella PVO Development Initiatives Project as well as the multi-year Agricultural Marketing and Technology Transfer Project [AMTT] and non-project assistance supported Agriculture Trade Policy Reform Program [ATPRP]. This last program will address policies and regulations constraining agricultural market efficiency including import and export taxes and fees which raise Chadian costs of production in the UDEAC customs area harming Chad's comparative advantages in particular crops.

The geographic embrace of the project was widened from the Sahel to include the Sudanian zone, essentially the lower half of Chad, and DIP sub-projects are scattered throughout both zones [map].

The project, and subject of the present evaluation, was

amended and extended to June 30, 1995. The purpose of the amended DIP is to:

to improve agricultural marketing, increase small-farmer productivity, improve job skills through training, and develop private business having demonstration and institutional development effects.

The PVO implemented projects under the umbrella, in order of authorization, include:

<u>PVO</u>	<u>Sub-Project Title</u>	<u>Total Funding US\$</u>	<u>PACD</u>
ACDI	Pilot Fruit & Vegetable Marketing	2,429,400	12/31/92
CARE	Kanem Pumps & Agricultural Marketing	1,149,700	4/30/93
CARE	Kim Area Agricultural Marketing	811,400	4/30/93
VITA	Private Enterprise Promotion III	4,600,000	6/30/94*
ORT	Lake Chad Agricultural Development & Farmer Training - Phase II Marketing & Technology Dissemination	2,570,800	7/31/94
Africare	Ouaddai Economic Strengthening Initiative	1,800,600	6/17/94
Total Obligations - LOP		13,722,100	

* extended by one year to 6/30/94, with additional funding.

The following projects will be terminated early on security grounds -

CARE/Kanem	April 1993
ORT/N'Gouri	December 1992

and the ACDE/Keral project, which has been extended by six months, will come to an end in June 1993.

III

A. Summary of Findings

Findings regarding the project as a whole

The project has:

- o contributed to food security.

o provided labor saving technology which has benefitted men and women.

o contributed to: [1] income generation through marketing technology or [2] establishment of group managed group funds for mutual advancement.

o contributed to institutional sustainability in at least three ways: [1] supported long term presence of US PVOs which offer a viable alternative to GOC-sponsored development in a period of uncertainty; [2] supported groupements which are mainly but not entirely temporary community responses to what members see as targets of opportunity; [3] promoted technology which has proved a mixed bag although some appear sustainable, for example, hand pumps, well drilling, onion storage and tomato drying.

o made credit available to the smallest scale entrepreneurs.

o provided a decentralized mode of delivery capable of adapting to the different contexts in which project activities were undertaken.

o has benefitted women mainly through labor-saving food security, income generation and credit, while addressed mostly to men.

Findings regarding the umbrella project

o the umbrella has been found to be an efficient mode of implementation of a project which includes a number of dissimilar agents.

o the success of the umbrella mode depends in unusually large measure upon the project manager - his ability to cause the partners to pull together as a team, his sensitivity to the needs of the particular partners, his ability to coordinate using a variety of methods while not appearing to dominate.

Why? o a carefully and thoughtfully prepared contract is of at least equal importance to the institutional location of the project management.

o the umbrella may be marginally more effectively managed from without the USAID, but the quality of the project manager is more important than the management mode.

o while the umbrella has been utilized in the project primarily for its bureaucratic dimensions its potential as a development tool remains underutilized.

Project Findings

o PVOs have found it easier to shift from relief and concern with food security to production as the primary project purpose than from production to an exclusive focus on marketing. This reflects in part their fundamental orientation towards humanitarian goals and hampers their ability to respond flexibly to local conditions.

o Project progress measures utilized by the separate projects have not on the whole been very useful. This is because they stress means rather than results. For example, a target might be the completion of a building, not the accomplishment of its purpose which is to promote a marketing strategy. Similarly, stress upon numbers of activities mask what their intended purpose is. The problem centers on the effort to use quantitative measures for accomplishments needing a qualitative measure. For example, counting demonstration plots as a progress measure misses the objective which is adoption by farmers. Designers are prone to this because numbers of adopters may only occur beyond the life of the project.

Project Design

o Assumptions represent necessary but not sufficient criteria for project success. The longer the list of assumptions the less likely the project will succeed. The designers did not understand this and assumptions abound in each project paper. For example, national growth is not in fact necessary for realization of many objectives, yet impressive and unlikely figures are advanced throughout the papers. In many particular instances public stability may not be terribly important at the farmers level. Assumptions should not be thrown about casually - the rule should be - the failure of an assumption to materialize means project failure is more likely. Is this true in each particular case.

o Project objectives failed to distinguish between farmers' objectives and project objectives. While the farmers' primary objective is food security the project assumes it is the earning of extra cash income. Farmers' are more likely to maintain activities which are consistent with their own priorities. *is not a priority*

o Project design made incorrect assumptions concerning the binding constraints on marketing. Markets appear, based on admittedly anecdotal evidence, to be price efficient and not segmented to a degree that they are inoperative. *check this*

Are we talking about the overall project?

is it a priority?

check this

Future Support

o

B. The Six Sub-Projects - Findings and Conclusions

The separate evaluations underlying this section are to be found in Annexes a through f. This section summarizes the findings and conclusions and turns to the longer term issue of sustainability using as its point of departure each project's current situation with respect to its planned position at the end-of-project together with the relevant assumptions needed to assure long-term sustainability.

The six projects vary somewhat among themselves - a point illustrated in Table _____. It is clear, for example, that promotion of production has not been entirely dropped in the present marketing-oriented phase. Indeed in the case of the ORT project in N'Gouri marketing has been added to a continuing concern to raise productivity and protect production through an extension of irrigation. An similarly in the case of the CARE project in Kanem. Marketing is the paramount and almost exclusive concern in Kereal [ACDI], Kim [CARE] and Abeche [Africare]. Support has continued in both Kim and Abeche for pre-cooperatives responsible for the operation of water management systems installed in the previous phase. In this connection three sorts of pumps - hand, motor and animal powered - have been studied and introduced. All six promote small scale private enterprise but from differing angles: well drilling and pumps - Kanem and N'Gouri; marketing - all projects; short term credit to farmers - Abeche; marketing through groupements - Kim, Abeche, Karal; and micro and small enterprises - VITA. Most of the sub-projects have a processing component [tomato powder, peanut oil] - Abeche, Kim are the most advanced, and these may be owned by womens groupements.

Most of the projects have undertaken tests into various appropriate forms of packaging and drying of produce - of which the Kereal project has perhaps been the most ambitious. The projects generally have at least considered earning value added from some form of grading and/or trade on the established reputation of their produce to earn extra income.

CARE 1. The Kanem Pumps and Agricultural Marketing Sub-Project -

The project is being prematurely terminated because of continuing insecurity in the region. The project has focused upon [1] introduction of hand pumps and well drilling

technology and [2] sensitizing farmers to marketing strategies including price awareness.

The project will leave a core of trained artisans capable of making, repairing and maintaining hand pumps. About 50 of these have been installed.

The project has fallen short of its objectives regarding number of hand pumps installed, in large measure because the original objectives were unrealistic [500 by EOP]. Furthermore, farmers showed little interest in the new drying technologies.

It was found that price and marketing information was available although usually several days old. The women's groupements showed themselves quite able to trade and take advantage of market opportunities in the trading of produce. Only limited use appeared to be made of posted prices.

It is doubtful farmers will be able to continue the marketing strategy if a drought intervenes. The artisans are undercapitalized and lack sufficient transport. They are able to handle pump and well drilling within a small radius of the project towns.

2. The Kim Area Marketing Sub-Project - CARE

The project focuses almost entirely on marketing .. womens groupements of taro and produce grown on irrigated perimeters, mainly rice. Women's groupements have been growing mixed vegetable crops for market on fields irrigated by hand. Prices have been collected in five local markets and are distributed monthly.

The project has neglected the protection of the rice production base and yields are consequently low and falling. The rice production groupements are felt to be too large for effective self-management. The women's groupements have turned out to be mainly interested in production for home consumption and in selling as individuals.

Price information is widely known as both men and women travel among local and national markets. The project will end by April 1993.

The evaluation is of the opinion that not much can be accomplished using the present set of objectives. A future project would have to address the rice production problem.

II 3. The Lake Chad Agricultural Development and Farmer Training

Sub-Project - ORT

This project builds upon a successful set of production related interventions initiated in an earlier phase. These appear to have been adopted by farmers and are spreading autonomously. ORT has built on its long suit as an agency which is training.

The present phase focuses upon post-harvest storage, packaging, marketing strategies and the extension of water supply technologies. Prices are collected from N'Djamena, sent by ORT radio to N'Gouri, and disseminated locally. Price information does not appear however to have been a local constraint.

The project areas has been particularly hard hit by domestic insecurity such that the Mission has decided to terminate what is a successful project. ORT has submitted a phase-out plan which focuses on the training. The project will end in December 1992.

4. The Ouaddai Economic Strengthening Initiative Sub-Project - AFRICARE

The project's present phase only got underway in early 1992 and will last until June 1994, which is sufficient time for it to realize its objectives.

The project has built upon substantial accomplishments sustained in an earlier phase when several dikes were constructed to assist in food security. Although the area is economically and physically remote from Chad's principal markets it produces superior onions and dried tomatoes for them. The tomatoes are produced behind the dikes using recessional agriculture.

The project has succeeded in the introduction of cost-effective drying and storage methods. It assists in the training of farmers organizations in dike management and maintenance.

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An important strategy being initiated is the processing of peanuts for oil and tomatoes for dried powder. The project hopes to upgrade the latter's quality and sell it as a retail good under its own label.

It is not clear that farmers have great need for the price information collected under the project. Local commercants make good use of phone connections with N'Djamena whose prices are closely tracked by the interested parties.

Long term survivability depends upon continuation of reasonable rainfall. Should the drought return farmers survival strategy may call for a shift from commercial to food crops on recessional fields. It is unclear how easily farmers could move back and forth without assistance.

5. The Pilot Fruit and Vegetable Marketing Sub-Project - ACDI

This project has had an unfortunate history - difficult and late staffing and later a full turnover in staff. This is also an instance where AID's stress upon marketing effectively masked the underlying production problem. What is needed are appropriate varieties of tomato to market which would have required an important agronomic input. Although an agronomist was in fact supplied his scope of work stressed post harvest technology.

*ACDI drew
✓ YW proposal
& site not
YW market*

The project has only accomplished preliminary training of farmers in post harvest technologies and little conclusive progress has been sustained. It is not clear that farmers were as unaware of final market prices and market strategies as the project assumed.

The project assisted in the construction of various physical assets - hangars in both Karal and N'Djamena. The most important accomplishment has been the gathering, analysis and distribution of price and market information which will be of use to AMTT.

After the project came into existance a local farmers federation came into being to which the project has given important support.

The area has real economic potential lying close to Chad's largest market, good roads and having the capability to produce up to three

crops annually. The recommendation is advanced that the area and its federation continue to get donor attention and support.

The Karal project will come to an end by early 1993.

6. The Private Enterprise Promotion III Sub-Project - VITA

The VITA/PEP addresses previously unmet credit needs for small scale entrepreneurs. The project has demonstrated that this class of borrowers do not need subsidized credit, are credit worthy, and capable of using credit effectively to buy inventory, machines etc. The borrowers have on the whole a good repayment record especially in the context of general business insecurity.

what rate

In addition to USAID money the project has received support from both UNDP and the World Bank.

The project's training component is an important contribution to general development. It may be difficult to sustain this component as a fully privatized institution unless special actions are taken. For one thing the interest rates must be allowed to reflect real costs of doing business and the scarcity of capital.

I submit never

Great question exists regarding the institutions sustainability after EOP. The recommendation is made that the credit facility be sheltered under a donor umbrella for a considerable period. The Chadian director should be kept on as an employee of VITA and close scrutiny given to its loan practices. In the long run some kind of cooperative credit institution may be brought into being.

VITA/PEP has been extended with additional funding until mid-1994.

IV

A. Evaluation of the Overall Project

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AMT
PD + PD
acc
ATPRD

No study has been made of the marketing system such that the underlying assumption regarding its ability to efficiently communicate price signals is untested. In the course of the evaluation farmers, farmer-cum-commercants and commercants were asked about market operations. The following preliminary insights were developed. Where telephone service exists, and in the present context this only exists between Abeche and N'Djamena, commercants were in constant touch between assembly and final markets. Prices were essentially communicated daily. Where telephone service does not exist, which is the case in N'Gouri, Kim, Cheddra, and Karal, a continuous coming and going of traders, transporters, farmers themselves, relatives etc, ensures that reasonably current price information is communicated. In Cheddra, for example, two day old price information was generally available. Additionally farmers were found to be quite aware of general annual swings in prices and the reasons for this.

Competition exists as well. Farmers in Abeche reported that they had three choices when selling their produce. Dealers came to their gates when supply was short and tried to buy directly. Farmers could take their produce to market and sell it there directly. Or they had the choice of selling at the edge of the city where commercants or their agents usually posted themselves. It seems to be fairly easy to become a trader. apprentices need only some capital which can be borrowed from family or friends - so that a large number are on the scene.

this needs
a ppportunity
accountability

We asked about the movement of capital from Abeche and N'Djamena. Our respondent replied that actual money is not transferred. Rather dealers settle accounts, directly or indirectly, at either end - and this often within a network of relatives, friends, village brothers etc. For example, instead of a payment a buyer might pay off a debt owed by the seller where the buyer is located. In sum, goods move, cash doesn't.

Are farmers compelled to sell at harvest? Our sources indicate that short term debt often exists as farmers have borrowed food after their stocks were exhausted and usually must repay in kind - a bag for a bag. The repayment is made at harvest. Although farmers are perfectly aware of the money value of a bag at different times, the claims of social reciprocity are of equal if not greater importance at the village level. Farmers market choices are limited, once social claims and subsistence needs met, in that they lack the ability to store efficiently and here the provision of credit to tide them over until market prices rise is of importance.

1. Consistency of the Project with USAID, AID and GOC Goals.

The Africa Bureau's Strategic Framework for Promoting Agricultural marketing and business development in sub-Saharan Africa includes the capability of market participants to engage in marketing activities. USAID/Chad has initiated DIP, AMTI and ATPRP to address various constraints to Chadian farmers and commercants to become more effective participants in marketing.

The GOC has not engaged in policies antithical to private enterprise. For whatever reason the country has been free of most of the policies adopted by others in Africa aimed at controlling prices, marketing, private investment etc. It is probable these pro-business policies will continue. These policies will become even more favorable to the extent ATPRP succeeds in its objectives.

2. Validity of the Project's Assumptions

The DIP builds upon three assumptions - one technical and two behavioral. First, that the existing marketing system does not adequately convey information to the farmer. But if it did then, two, farmers would actively seek out the highest possible price, and, three, they would employ various strategies to so position themselves that they could maximize income. Restated, it is assumed that farmers presently sell at time of low prices because they are unable due to various technical and economic constraints including the need to pay debts due at harvest time and the inability to store produce for later sale. The further assumption is made that cash income is of primary importance to the farmer.

mis ov
system?

The project strategy has been to help the farmer to raise incomes through the provision of storage technology and the means to transform produce to gain a higher value added and by the provision of market information to enable the farmer to plot an appropriate market strategy which would allow him to sell when and where prices are optimum. The project recognizes the importance of high transportation costs and addresses this through the production of a higher value lower volume product - for example, the conversion of a fresh tomatoes into dry powder.

Finally it is assumed that these interventions meet a real need, which they must if they are to be self-sustaining beyond the end of the life of the project.

B. USAID/Chad's Management Role

The USAID's management role has been defined and delimited through the use of an 'umbrella'. The underlying documentation states that this project differs from conventional PVO 'umbrella' projects in that [1] it is limited to six sub-projects; [2] these are of comparatively large magnitude - from US\$; [3] the efforts they represent are central to AID's program rationale and [4] they are expected largely to be conceived and implemented by PVO's already financed by AID in Chad and undertaking activities that are the precursors to those anticipated under the new project.

C. Role of the Government of Chad

Some PVO's depend upon GOC organizations to implement their projects - others have virtually no such links at all. The PVO's and their GOC counterpart agencies are spelt out below.

PVO's and their links to
GOC organizations

PVO	Supporting GOC Unit
CARE	forestry and genie rural [Kanem]
ORT	SODELAC
ACDI	3 staff from MOA/DSA 2 staff from ONAD links with ONDR
VITA	GOC represented on advisory committee
Africare	forestry and genie rural, ONDR

Source: PVO's

ORT has worked closely and with good results with SODELAC, a GOC parastatal. ORT has established good working relations with civilian local government, although the military presence has been less rewarding. CARE/Kanem developed useful links with their local forestry and genie rural. Less fortunate has been ACDI which received only three of seven promised staff slated to work with them in the collection of statistical data. GOC units in the Abeche area have worked well with the Africare project. Taken as a whole, however, GOC support has been weak, but this should not have been a surprise given the country's recent history.

D. Linkage of the PVO Sub-Projects with the AMTT and NPA

1. AMTT

The Agriculture Marketing Technology Transfer [AMTT] began in 1992. It seeks to address three critical market constraints which include: [1] lack of market information; [2] inability to identify and finance viable investment projects in agri-business and [3] lack of data and analysis needed for agriculture price information. Elements of DIP are seen by the Mission as a 'bridge' whereby price information is collected in markets important to a particular sub-project and distributed to interested parties through bulletin boards located at various markets. Producers and commercants in the Abeche, Kanem and N'Gouri area are supplied with reasonably current information on selected product prices in the N'Djamena markets. The Kim project collects and distributes only information gathered in neighboring markets. The ACDI project has collected, analyzed and produced a comprehensive review of vegetable prices for [at one time 47] products coming from the Keral area and sold in the various N'Djamena markets. The DIP works on the assumption that farmers and commercants will use locally posted price information as an addition, and perhaps cross check, to information available from other sources and use these in the preparation of their particular marketing strategies.

Unfortunately the most ambitious price collection and dissemination scheme, that operated by the ACDI Karal fruit and vegetable sub-project, ends a full year before the AMTT project will be able to assume at least some portion of the work. And similarly in the case of the two CARE and ORT implemented projects.

Even so the sub-projects have gathered sufficient information about markets to support the belief that an investment in market information pays off. The work has demonstrated that [1] competitive markets now function at least in the sub-project areas and between these areas and the principal urban markets, [2] farmers and local commercants are sensitive to and make use of price information from both local and the N'Djamena markets, [3] the final markets are to some extent quality conscious [within limits permitted by very low

~~average incomes] and that buyers seek produce~~
from particular sources known to have certain characteristics and [4] the cost composition of market margins are better understood. Tomato producers in Keral, for example, appear to earn from 35 to 40 percent of the wholesale and retail prices paid in N'Djamena. Transportation may be as high as 70 percent of the market margin between producers and final consumers. The project has, once again, demonstrated the high losses sustained by farmers using traditional storage methods and thus the importance of better methods in connection with marketing strategy.

The DIP has shown as well that commercants make extensive use of the telephone system where this exists. Unfortunately telephone links only exist among N'Djamena, Abeche, Largeau, Mongou and Sarh.

2. ATPRP/non-project assistance.

The project purpose is to increase the efficiency of the agricultural marketing system for non-industrial [read cotton] crops. The strategy for accomplishing this is to [1] reduce the import duty on trucks and spare parts; [2] reduce the import duty on agricultural inputs; [3] removing all export duties on agricultural products and [4] increasing the capacity of the private sector. A successful ATPRP would help DIP sub-projects in every one of these instances.

It is argued in the ATPRP project paper that from 10 to 20 percent of the cost of transport reflects high import tariffs on trucks and spare parts. The evaluation endorses once again the fact that transportation represents the largest single component of the margin between farm and final consumer [adding CFA 750 to the CFA1000 farm gate price for produce sold near Abeche when transported to the capital]. It also conditions the sort of market an particular area can exploit. Fresh produce cannot be shipped without an important loss. Abeche, for example, can only export dried produce to N'Djamena and the south east of the country is effectively excluded from central markets. The importance of cheaper transport is illustrated in Map __, which compares the geographical spread of rural

producers with the principal highways. Producers are in a large number of instances randomly scattered with respect to physical access to markets.

Nigeria provides spare parts for pumps, some fertilizer and agro-chemicals. Reductions in import duties would benefit farmers. Of interest too would be the practical effect of duty free manufactured inputs now produced under monopoly conditions by SIMAT. It has been argued that an important contributing factor to the high levels of failure to repay debts to the VITA project by farmer borrowers in the Bongor area was the use of this money to buy SIMAT products which broke down.

Any reduction in export tariffs would work to promote sales of tomato powder, dried vegetable produce and cow peas [were Chad to end the export ban]. Cow peas have considerable potential in the Keral area.

Finally, it is likely, even probable, that SME's loans could be used by private firms to finance exports to UDEAC countries were markets in those countries to open up.

D. Activities of Other Non-Governmental Organizations and PVO and their Relations to the PVO Project and Sub-Projects

How closely have the PVO's worked with Chadian NGO's? On the whole not much with one notable exception, ACDI and SECADEV.

PVO	NGO's	Quality of links
ACDI	SECADEV	good
ORT	none	n/a
VITA	none	n/a
CARE	none	n/a
Africare	none	n/a

Source: PVO's

These links are spelt out in the relevant annex. In Abeche Africare staff have worked closely with a Parent Teachers Association in the area, DARNA, and have transferred various management practices to strengthen the organization.

E. Suitability of Progress Measures¹

Only one of the sub-projects has prepared a through base line with respect to which progress can be measured - Africare. The VITA project has attempted a practical approach using measures based on a balance sheet prepared at the time of a loan application.

In the case of the DIP the entire benefit is contingent upon the project's ability to increase incomes from a given level of production as the result of certain changes [recall in this connection that the project does not seek to increase production, that was accomplished in an earlier phase - in this phase production is protected]. Increased incomes are expected to result from changes in farm technologies, most notably having to do with storage, and behavior related to marketing and the search for extra cash income. The effect of technical changes can be observed and their effects measured directly. The measures used in Ouaddai can be monitored - losses in storage, percentage of produce marketed, prices received. More difficult is behaviour. The Ouaddai base line study is of particular importance because it underscores the need to carefully prepare a base line so as to be able to measure expected and probable events while not confusing assumptions and hypothesis with a clear cause and effect.

How can we be sure a change is due to an improved delivery of price information or extra marketing due to a shift in risk perceptions? The analyst must be wary of imputing linkage between interventions.

Organizational changes are expected as well - most notably organization of farmers into pre-cooperatives and various forms of production related groupements. These last can be measured by direct observation.

The base line prepared in Ouaddai faces up to the problems encountered in such an attempt and underscores the difficulty and cost of measuring impact such that believable results are obtained. For one thing, a control group is needed, which must be observed with the same diligence as is expended upon the project change group. A second factor, and one routinely overlooked in AID project planning, is the length of time needed to have an impact. In most cases three years, the typical LOP of DIP sub-projects, is simply not enough time to

¹. Much of this section directly benefits from the Base Line Study prepared for the Ouaddai Economic Strengthening Initiative by Walter West and submitted in March 1992. This is an excellent appraisal of the logic underlying the selection of progress measures and deserves to be applied to the project as a whole.

register progress when a change in behavior is expected of a broad class of people.

In a three year period little more than practical demonstrations can be attempted in situations where a substantial change in behavior is needed. Storage is an example. The smallest family level unit may cost CFA 40,000. By year three in a project how many farmers can reasonably be expected to swallow the risk, find the capital and engage in a wholly new approach to farm management?

It is likely that a number of years will pass before even an important number of farmers in a village will be adopters. A series of post project soundings will be required to measure impact and spread - number of market strategies utilized, and their impact upon quality of life, income etc.

IV

A. Appropriateness and Replicability of the Umbrella Mechanism for PVO Support

Annex A

PVC Development Initiatives:
Kanem Pumps and Agricultural Marketing
677-0051.H

Date of Authorization: May 1, 1990
PACD, revised, April 30, 1993
Date of Last Evaluation: February 1992
Date of Next Evaluation:
LOP Obligation: US\$1,149.7
Project Implemented by CARE

I

A. Introduction

The project was originally scheduled to finish in April 1993, but as it was feared the local security situation had the potential to change suddenly a determination was made to advance this date to December 30, 1992. This evaluation is in consequence an end-of-project appraisal of progress made and lessons learnt. The project is the second in the area implemented by CARE. The first phase, 1986-90, tested the hand-operated pumps and determined them practical and technically and economically interesting to local agriculture. Since its launching in May 1990 the project has made considerable progress inspite of periodic punctuation by local disturbances which caused the project to be shut down at critical junctures during each growing season.

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B. Project Background

1. Project Area

The project area comprises a series of oasis towns from the north east of Lake Chad [Cheddra - about 70 kilometers, 40 miles, from the lake] to Mao over 150 kilometers to the northwest and nearly 100 kilometers from the lake. At one point, security permitting, even more remote Noukou, 100 kilometers north of Mao was included. Marketing projects were included as well in Moussoro and Birchamchi near Cheddra. The area's vegetation is transitional from Sahelian to near desert.

2. Commercial Agriculture in Area

Farmers can grow two crops annually - millet during the rainy season and selected

2

vegetables in the oasis. Here pump irrigation is practiced with traditional water lifting equipment, shadouf, raising water up to seven meters from the water table. The shadouf can irrigate 7 ares [15 percent of an acre] but requires two adults or one adult and youth to operate it for an entire work day.

II

A. The Kanem Pumps and Agricultural Marketing Project

1. Project Purpose:

- a. To provide 1,800 Kanem farmers sustainable access to improved water-lifting technology [located in wadi's], supported by local private sector artisans.
- b. To improve incomes of 1,000 Cheddra area farmers from sale of wadi produce to local and national markets.

2. The Technical and Economic Problems Addressed by the Project and Strategy Adopted

The principal agricultural product produced in the area and in demand in large final markets, of which N'Djamena is the most important, are onions. The crop is seasonal in Chad and markets are swamped at harvest time. The project has done some work to perfect onion drying and storage so that produce can be available later in the season when prices are higher. This is an additional potential source of income to groupements. The technical judgement made by the evaluation is that very little progress has been made towards perfection of this technique and the judgement is made by the project that farmers do not see the need for the extra effort required to dry with new techniques. This is recognized to cull drying onions more carefully. In a related area, packaging of tomatoes for transport, some tests have been made, but nothing has been found that is cost effective with respect to traditional loose packing.

To support marketing the project has introduced the farmers to the need to maintain

~~funds sufficient to allow them to hold stocks of produce in storage until prices rise - three or four later. The project provided seed capital in the form 60 percent of the value of an onion crop destined for sale to be repaid at final sale. Thirty loans have been made and all repaid. The project, however, does not attempt to establish a revolving fund.~~

Farmers face a labor constraint inhibiting their ability to expand agriculture and from adopting any technology which places additional labor demands upon them. The Kanem Pump and Agricultural Marketing Project introduces the hand pump, a relatively low cost water lifting device which can be made from and repaired using local materials and to replace the labor demanding shadouf. The pump raises the area under irrigation command only marginally, by one or two ares, but does it much more quickly using only one person for up to three hours. This effectively frees an adult for alternative work who would have otherwise had to man the pump for an entire working day.

The hand pump is moderately expensive by local standards [CFA32,000 - and may rise to CFA50,000 when buyers have to pay for all costs including transport to the area]. The project has sought to ensure that an indigenous capacity to drill shallow tube wells and mount hand [or even motor driven] pumps is locally available. A number [23] of 'artisans' have been trained in both of these skills. The project has made available to them a kit containing all of the basic tools needed to do the work in addition to training. Should an apprentice decide to enter the business on his own, an initial outlay of around US\$500 would be required to buy the basic tools and equipment.

Although the Kanem area is linked with the N'Djamena produce markets through the commercants, farmers, it is believed, have been insufficiently informed as to final prices in that market. The project assumed that if farmers were fully aware of current final prices for their produce they could obtain a better farm gate price. Farmers face

a competitive market and can bargain. The project established a system based on price gathering in the final market and using the CARE radio link to send current prices to the project area where they were posted in the Cheddra market.

B. Progress of the Progress to Date of Evaluation

1. Impact on Beneficiaries

The project is approaching the end of its three year life. The project installs some 50 pumps. Training has been given to 23 artisans to enable them to build, repair, maintain pumps and support farmers in their use. In addition 700 farmers have been shown the utility of these pumps. The initial goal of 500 pumps has proven to be impractical, because of the work stoppages due to insecurity. Also the final demand for pumps costing CFA 32,000, was found inadequate at current costs and prices for inputs and outputs. Twenty six onion producer groupements including 326 members have been organized.

Two womens groupements have formed and have obtained a hand pump to water group plots. Members pay a fee to the groupement to pay for inputs and prepare the overall perimeter together. However, members cultivate their individual plots within the perimeter.

2. Effectiveness of Interventions Towards Purpose

The evaluation found that much more progress has been made, comparatively speaking, in the promotion of hand pumps and their support, than with the introduction of various drying techniques.

Although the pumps have been demonstrated to be valuable and within the technical capacity... of local artisans to support, their actual out-of-pocket cost, expected to be around CFA 50,000, will put a limit on their demand. On the other hand, where a farmer or farmers can put together this amount, the pump will pay for itself in an single season. Alternative pumping technologies have not explored. The evaluation is of the opinion that the bidon verseur, currently being introduced under the

DIP in the N'Gouri area, could be a viable alternative.

The evaluation agronomist found the work on drying to be inconclusive and not particularly well planned. The quality of dried product was unsuitable to market need. Smut was found on stored onions which were not being culled. Still a few marketing runs were made using onions stored eight weeks, and got better prices. The attempt was viewed as a demonstration only. Packaging tests were made as well using tea chests. Experiments run with putting in holes for aeration but the twenty percent shrinkage expected [during transport from Kanem to N'Dammena] in the original project design and attributed to inadequate packaging was found to be excessive.

It is very unclear whether farmers make much use of the price information collected by project staff and is presented in both French and Arabic on boards in the central market. It is evident that discussions with farmers and farmers-cum-commercants suggest that farmers are generally informed about final prices but that the information is usually several days out of date. There is a continuous coming and going by relatives, neighbors, traders etc who bring with them market information. It is possible, although this could not be ascertained, that the project-supplied price information, is used as an additional source, although it is no more up to date than alternative sources.

3. How Has the Private Sector Been Affected

It would be premature, and ~~probably overly sanguine~~, to claim that a new private sector industry has been created. The facts seem to be as follows. Five artisan teams have been trained, one in each of the five project centers. The private sector at present can supply hand pumps, maintain them and drill wells. The demand, however, is limited when artisans must charge the full cost of materials - CFA 50,000, nearly CFA 20,000 more than the project charged [transport of materials from N'Djamena to the site was paid for by the project]. The artisans complain

that their effective radius of working is limited by lack of transport. The group in Mao make use of three camels to haul drilling equipment - and the cost effective radius is limited to the distance they can walk in one day around Mao. A vehicle could be hired but the extra cost, when passed on to the farmer, would be beyond typical means to pay.

C. Suitability of Progress Measures

Whereas the measures selected, numbers of pumps, adapters etc, were correct, the actual numbers chosen [500 users by EOPS] proved to be much beyond the effective level of demand for pumps by farmers. The trend towards exaggerated demand was reflected as well in the estimated numbers of wells drilled by private artisans - 50 demanded, drilled and paid for instead of 500 planned. The formation of farmers groupements came close to the numbers originally planned.

Similarly, expected levels of marketings, reduction in losses due to storage, adoption of packaging technologies has proven overly sanguine. In the case of storage the team found the produce had been poorly selected, not properly watched over by farmers, up to 30 percent had been contaminated with smut and not culled. Several packaging techniques had been tested [see below] and none adopted. The tea box had been modified with extra holes but this test proved inconclusive in that a number of boxes vanished in the N'Djamena market.

Training, on the other hand, has come much closer to expectation. Seven hundred farmers have been exposed even in the context of disruption and a shortening of the project.

D. End of Project Status

The project will be terminated at the end of 1992. By that time it is expected that enough artisans will have been trained to be able to meet the demand for hand-pumps. It is further expected that final demand for onions will be sufficient to attract farmers, as individuals or in groupements, to pay CFA 32,000 for a pump. But, if as expected, the price raised to CFA 50,000, effective demand will be much less.

It is further expected that farmers will be more sensitized to market opportunities in N'Djamena, the principal market in western Chad near to the project area, to grow more onions for the market and to hold some

~~quantity in storage in the hopes of higher prices in the post-harvest season.~~

By the end of the project, and at time of writing, in addition to the groupement members, a further 150 may see the price announcements placed in central markets in the project area every week. This information may be used as an additional source of prices by local commercants and farmers.

III

A. AID support for the field project

The underlying project design was well conceived although the particular output targets were found to be for the most part unrealistic.

The present project officer has been very supportive. The former ADO, it was felt, ~~ADO~~ over directed, was very unrealistic with respect to what could be done while managing from afar at AID. The current management is very supportive. Very important, he has been realistic as to what is and is not practicable and gives useful technical leeway to field staff.

B. Linkages with Other PVOs

Two project-wide PVO meetings have been held, in 1990 and 1992 [the 1991 affair was cancelled due to political problems at the time]. With particular regard to the CARE project, the implementation team feels it has had a good working relationship with the CARE office in the capital. The project has found it necessary for field staff to come to N'Djamena from time to time to push clearances and generally follow-up requests.

With respect to the other PVOs generally good relationships have been the case and all have been responsive to particular requests. ACDI, for example, has been very helpful viz containers and market information. Africare aided in tomato, transformation, shipping and handling. The project would have liked VITA to include artisans as SME loan candidates. The project would like to explore the possibility of collaborative assistance in the training of illiterates in simple book-keeping.

C. Links with NGO's

Very tenuous links exist with SECADEV which is consulted on various rural development issues. BIEP [Bureau Interministerial des Etudes et de Programation], a quasi

official research institution comprised of civil servants who sell part of their time as consultants, did a packaging study for tomato and melon.

D. Role of the Government of Chad

GOC has been cooperative but lacks means. Unofficially, ONDR support the setting up of and doing price collection at the local markets. ONDR provides help also from the genie rurale. DEFPA [Direction des Etudes et Formation Professionnel Agricole] sent a very useful trainer- sets up training, Genie rurale, one person. ONHPV [Office Nationale de l'Hydrolique Pastoral et Villageoise] has provided water table maps.

IV

A. Issues and Recommendations

Two sorts of recommendations are advanced. The first group summarizes those actions which should be taken before EOP in April 1993 which, if taken, will go some way to raise the likelihood that some elements of the project sustain themselves. The second group include actions which may be undertaken in the future.

Before EOP

1. Issue Introduction/Trial of Bidon Verseur

The Kanem pumps and agriculture marketing project has been involved in the establishment of hand pumps in the project area. The initial pumps were partially subsidized to stimulate farmer interest. It would appear that the pricing of these pumps will tend to increase which will limit the number of farmers able to buy them [individually if not so much as members of a group].

Since the bidon verseur technology will be less expensive for those farmers who may not be able to afford a hand pump, the comparison of the bidon verseur in the Kanem area should be made known to them.

Recommendation

It is recommended that at least one bidon verseur demonstration be undertaken in the Kanem area.

After EOP

2. Issue, support of womens groupements

Women's groupements we were able to interview in Cheddra and Birdelep were active and entrepreneurial. The women's group¹ at Birdelep had been able to pay a dividend of 2500 FCFA to its members the first year, a sum sufficient to convince the members and their husbands that it was worth continuing their purchasing and stocking of onions, millet, and dates as a group. It is the Birdelep women who are interested in investing in a mill but do not know either how to buy or how to manage one.

Women also appreciated the labor savings from hand pumps, since they work with their husbands in the fields. The grain mill issue just discussed is, of course, of particular concern to women.

Recommendation:

CARE should bring representatives of the women's groupement at Birdelep to talk with the women's groupement at Ngouri that runs a mill, so that they can learn first-hand what is involved in purchasing and running a mill.

3. Issue: Social Impact of CARE interventions:

Both the introduction of hand pumps and the activities of groupements stimulated by the availability of credit from CARE fit into the spectrum of people's normal activities without creating conflicting demands. Both offer labor-saving devices, directly or indirectly, that people appreciate.

The handpumps are a direct and obvious way of getting the job of irrigation done in less time and less effort. In addition, at least one women's groupement with which we met also has organized specifically to put together a fund to purchase and set up a grain mill in

¹Technically a mixed groupement, because the women had recruited a token man to act as foreman in building their warehouse and representing them to the authorities.

Ngouri, since at the moment there is none. They see this mill as the solution to the onerous task of pounding grain by hand every day. They are not, however, informed at present about the costs of mills, the choice of types available, or the way to go about getting one.

Groupements had organized in response to the opportunity to apply for credit from CARE but seemed quite capable of sustaining their activities as long as they saw some payoff from them, whether CARE continues to offer credit or not.

The artisans CARE has trained to install and maintain wells are technically able to carry out operations without continued supervision but have been able to rely up to now on CARE's informal contributions to materials transport, particularly to sites in more distant wadis, which have kept the installation costs down considerably. It is difficult to say, at this point, whether, in CARE's absence, they will be able to offer well installation at a price people will be able to pay. In any case, without CARE's help the range within which they will be able to install wells will be restricted, but there is still demand close enough to be feasible if the price is not prohibitive.

Recommendations:

- a. Investigate sources of transport other than CARE vehicles for materials to more distant wadis and their costs, to see whether there are any affordable sources available.
- b. Consider options for creating a revolving fund for equipment maintenance.
- c. Encourage artisans to undertake training of people from areas outside the one in which they operate.

4. Issue Onion Storage

Due to the seasonality of onion production in the Kanem area only one storage trial of onions was examined. The four methods being

tested include: storage on woven mats placed on a storage rack; onions placed on sand; onions placed on mosquito netting and onions woven into the Bulgarian knots.

The onion stored on the woven mats and on sand exhibited an estimated loss of 30-50 percent due to smut and rot. Although losses in storage can be expected to high depending on the length of storage and the techniques being tested, the culling of undesirable onions weren't being closely monitored.

Although we were told stored onions were being culled every 10 days, closer attention should be taken to remove deteriorating onions before others are infested.

Recommendation

There will be insufficient time to do more trials. Lessons can be applied to other areas. Storage must be monitored.

Annex B
Kim Area Agricultural Marketing
Sub-Project
677-0051.I

Date of Authorization: May 1, 1990
PACD April 30, 1993
Date of Last Evaluation: June 1992
Date of Next Evaluation/Audit: October 1992
LOP Obligation: US\$811.4
Project Implemented by CARE

I

A: Introduction

The Kim Area Marketing Project represents in bold the assumption that marketing constraints have a grave effect upon agriculture's ability to realize its full potential once levels of production of staples are raised and maintained. The project centered its full attention to the collection and dissemination of local prices for a large number of locally traded goods on a monthly basis. Earlier evaluations had found that the project has indeed installed a mechanism to meet this need. The present evaluation attempted to gain insight into one issue - is the sort of information gathered made use of by local farmers and commercants, and is it an important addition to their existing knowledge of current prices.

B: Project Background

1. Project Area

The project area comprises a swath of land along the Lagone river upstream from Bongor centered around the town of Kim.

2. Commercial Agriculture in the Area.

The principal cereal produced in the area is paddy rice most of which is consumed in the area together with rainfed rice, maize, millet, sorghum, taro. Commercants move some paddy and taro to N'Djamena market.

II

A: Kim Area Agricultural Marketing Sub-Project

1. Project Purpose

To enable 600 farmers exploiting irrigated paddy in five villages of the Kim area to regularly implement improved strategies for marketing the produce of group-managed irrigated agricultural operations.

To enable 300 women, organized in groups throughout five project villages, to regularly implement more effective strategies for the marketing of agricultural produce by 1993.

2. Technical and Economic Problems Address - Strategy

The CARE project, building upon the increased total output sustained in the earlier production-centered project, focused upon increasing farmers cash incomes resulting from improved marketing. It was assumed that local markets worked poorly and that farmers did not, or could, not make effective use of them to sell surpluses. It was observed as well that women grew taro [cocoyam] on rainfed land but that they did not appear to be able to take full advantage of the active local market for the crop because they traveled to and sold in markets as individuals. Finally, no local capacity existed to efficiently hull rice which greatly limited the marketability of the paddy.

The CARE project addressed these marketing issues. Because it was assumed that current market prices for cereals and vegetables were not easily available to producers a component was introduced which collected and disseminated a wide range of retail prices in six local markets bi-monthly. Training was provided farmers through their perimeter management institutions regarding the desirability to store paddy at harvest for subsequent sale when prices had risen, sensitivity to price and the desirability of transporting and selling paddy in bulk. A rice hulling facility was imported into the Kim area for sale, it was hoped, to the five perimeter units as a group.

Women groupements were established to sell cocoyams. In fact they showed little interest in groups trading in cocoyam sales which proved to be a well organized efficient market but did show interest in growing a wide range of vegetables grown with the use of a hand pump. Although the land, a 1/10 of a hectare, was collectively owned and fenced, it was individually cultivated.

B: Progress to Date of Evaluation

1. Impact on Beneficiaries

Although 600 farmers were targeted it is believed that 550 have in fact been sensitized to marketing opportunities. As planned 30 farmers were given specialized training. The 550 farmers, and rice groupement members, include about five percent of the local population of nearly 12,000. But, and assuming a family counts seven persons, nearly 30 percent of the local population are directly benefited by the project.

Upwards of 500 farmers had obtained small parcel of land within five irrigated perimeters during the phase beginning in 1985. Farmers have plots of 1/4 ha each within the irrigation perimeter [although less than 20 percent of the farm families have such plots]. Farmers pay for the cost of irrigation water in either cash or kind at harvest - currently 4.5 sacks of 80 kg [out of a total average production of 15-20 sacks per parcel [15 sacks being a rate of 25 sacks or 2 metric tons per acre]. Groupements use a rather complicated but basically logical method to calculate the value of a sack of paddy - and includes an estimate of the likely amount of paddy produced, last years price, the price needed to cover pumping costs and an effort not to under price which would require that members be asked to make an extra contribution to meet costs. These variables are taken into account an a collective judgement arrived at. The price this year was CFA4500, roughly the price in the local market.

Marketing?

Curiously, the groupements do not as a matter of policy sell paddy on their own account in the N'Djamena market, where paddy would currently fetch CFA 11,000. No clear response could be obtained to account for this - and the best that can be said of the matter is that groupements do not want to assume the work involved in arranging for transport and the needed commercial links within the marketing system necessary to move and sell the produce. It has been suggested that the practice may reflect the extent to which perimeter managers have been conditioned to use the money only for an amortization fund.

The perimeter management units were intended to use the funds gained at harvest to finance a sinking fund to replacement their pump. In practice, however, a number of claims are made on the funds - to pay for extension of the perimeter to included families not presently having a plot, to pay to dike along the river as a protection against flood, for a second pump, or for distribution among members to pay for current consumption needs.

A recent survey found that little difference existed between the net incomes [value of paddy sold and home

consumed less cost of production in both kind and cash] of participating and non-participating farmers [calculated by the evaluation to amount to less than US\$45 per anum, from irrigated rice only]. But an important benefit received by irrigation farmers is possession of extra food security. Both sorts of farmers operate three or four parcels [2.55 ha by participants and 2.75 ha for non-participants] of rainfed land on which they grow millet, cocoyam and upland rice. A groupement farmer typically operates 2.8 ha of land in toto. Farmers in one groupement, where detailed observations were made, were found to earn 10 sacks of paddy from their perimeter for autoconsumption - this amounting to the return to family labor used on the parcel.¹ With respect to expenditures the groupement family while having about 13 percent more disposable cash income used this money to consume marginally more food [three percent] while having to use only half as much to repay debt [from four to two percent]. It should be stressed that these findings reflect a single year only and are likely to vary considerably between good and poor years.

It was discovered as well that local markets work efficiently given the poor transportation and limited local purchasing power. It is believed that local commercants obtain and make use of reasonably current information regarding prices in both local and more distant markets. Competition exists among commercants to buy from farmers.

The original project targeted 300 women as participating in the sale of cocoyam [taro]; in fact almost none have while over 125 have organized into still weak groupements to operate their vegetable growing perimeters. When counting beneficiaries it is unclear how many of these are members of families which have a parcel of irrigated land and are thus members of rice groupements. A small number are members both sorts of groupements.

CARE has found it difficult to sell the rice huller to the five irrigation groups. Two have expressed interest. Unless these can find the money to buy the unit CARE will remove it at EOPS.

2. Effectiveness of Interventions Towards Purpose

¹. The interested reader is directed to read the following for full details; Etude sur la situation economique des exploitants dans les perimetres irrigues, Haroun Sow, CARE-Tchad, December 1991.

A review of the data together with findings made during meetings with farmers and traders suggests that the project design underestimated the efficiency with which local markets operate. Local commercants and the irrigation groupements have reasonably current price information regarding both local and N'Djamena markets. Meetings with the executive committees of several groupements made it clear that producers are more sensitized to income making opportunities from marketing than before. But it seems clear as well that the project design overestimated the interest in group selling on the part of women.

If that the
were normally
2-3% + 10%
Riding

An unplanned net effect of both phases of the project has been to raise local production to a point where the area is self-sufficient in paddy and this, in the eyes of beneficiaries at least, is probably the most important benefit. This has occurred because of the sharp distinction drawn by USAID in the present project between production and marketing. As was pointed out in the mid-term evaluation 'the design of the project has been affected by the belief that food security and income generation are mutually exclusive'. What has been overlooked is that farmers look at rice production under irrigation as only part of a total strategy to survive in any likely level of drought or rain. Farmers do not want to depend upon a market for their survival - rather their overall strategy balances probable production from irrigated and rain fed crops on their own land! Depending upon their evaluation different annual strategies may be adopted. Labor, a farmers most limited input, is allocated accordingly. Cash is needed only for certain inputs used on irrigated land; their cash needs for consumption are limited. Cash income needs are consequently much more limited than AID's project planners assumed and is not their primary objective when making their farm plans. Farmers do not want to become dependent upon irrigation perimeters production on which are not fully under their control.

Security

This would
never

3. Has the Private Sector Been Affected

The project did not establish a base line with regard to local commercants and transporters so the project's effect on them is not well understood. Commercants do provide fuel and oil and spare parts for the pumps. A wide market spread seems to exist seasonally for paddy.

4. Particular Constraints

The principal constraint to more vigorous marketing of produce by farmers appears to be access to cheap surface

~~transportation. Areas as remote as Kim from large final markets in both Chad and neighboring Cameroun find it difficult to compete with better located producing areas. This equation could change if transport rates declined and yields were to increase more than proportionately to increases in cost.~~

5. Consistency with USAID and GOC Strategies

- pick this up as a general statement covering the whole project which is consistent by design

C: Suitability of Progress Measures

D: End of Project situation and Sustainability

The market price collection system is unlikely to survive. It is funded entirely by the project. It is the belief of the evaluation team that both farmers and commercants get more timely information more cheaply than they would if in some manner they were to pay for the project system.

The rice groupements can survive if their leadership is able to manage money in such a way that pumps can be replaced while gradually expanding irrigated area enough to defuse the pressure by non-holders to add land at rate beyond the groups financial ability to manage. Both the mid-term evaluation and the present evaluation found ground for concern that groupements may find social pressures to expend funds rapidly too much to cope.

Of more basic concern is whether the advances in rice production can be maintained [see attachment 1 below].

III

A: AID Support of Project

The project is fully implemented through the PVO. The PVO arranges for all procurement, TA etc used in the program.

B: Linkages with Other PVO's

~~It is clear that the AID project manager works to keep~~
channels open between the various sub-projects. This
certainly acts to facilitate inter PVO communication.
What is not clear, especially from the point of view of
CARE's field staff is how much different with would be to
establish useful links among PVO's in the absence of the
AID umbrella project.

C: Linkages with NGO's

There is one NGO

D: Role of GOC

Practically nil.

IV

Issues and Recommendations

Issue Should the Market Information Collection System be Maintained?

The evidence indicates that market information collected and 'published' once monthly plays practically no useful role.
KIM - INSTITUTIONAL ANALYSIS AND IMPACT ON WOMEN

Issue: Ethnic diversity, political rivalry, and their implications for development

The Kim region is ethnically and institutionally complex. Village politics are far from simple, many donors are active in the area, and groupements vary in size from a dozen or so to the rice perimeter groups of well over a hundred. One reflection of all this is the amount of variation in the degree of sophistication one encounters in the five or six villages all situated (except for Eré) within a mere ___ km. stretch along the road from Bongor to Lai. These complexities have ramifications for project management and sustainability in the area, some of which CARE's USAID-funded projects have already encountered.

Six or more ethnic groups speaking allied languages, not all of which are mutually intelligible have evidently inhabited the region since well before the drought period. A 1987 socioeconomic study lists the ethnic groups inhabiting each town in the project area; though some towns are coterminous with a single ethnicity, some are mixed, including, notably, Kim. The same study also sketches the political organization of the villages,

It is clear that the AID project manager works to keep channels open between the various sub-projects. This certainly acts to facilitate inter PVO communication. What is not clear, especially from the point of view of CARE's field staff is how much different with would be to establish useful links among PVO's in the absence of the AID umbrella project.

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There is one NGO

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KIM - INSTITUTIONAL ANALYSIS AND IMPACT ON WOMEN

Issue: Ethnic diversity, political rivalry, and their implications for development

The Kim region is ethnically and institutionally complex. Village politics are far from simple, many donors are active in the area, and groupements vary in size from a dozen or so to the rice perimeter groups of well over a hundred. One reflection of all this is the amount of variation in the degree of sophistication one encounters in the five or six villages all situated (except for Eré) within a mere ___ km. stretch along the road from Bongor to Lai. These complexities have ramifications for project management and sustainability in the area, some of which CARE's USAID-funded projects have already encountered.

Six or more ethnic groups speaking allied languages, not all of which are mutually intelligible have evidently inhabited the region since well before the drought period. A 1987 socioeconomic study lists the ethnic groups inhabiting each town in the project area; though some towns are coterminous with a single ethnicity, some are mixed, including, notably, Kim. The same study also sketches the political organization of the villages,

~~extreme~~, the village of Kolobo, which has had an active village association for at least nine years, has, according to its rice groupement's secretary-general, what amounts to a comprehensive village development plan of its own with donor agencies in the area slotted in where they are most appropriate. Activities include: a school, now up and running; tree planting and live hedges; a village pharmacy, with support from EIRENE; a major move from its riverside site to a location along the road, aided by Cooperation Française; and the rice perimeter, for which the rice groupement envisages CARE as a possible source for a needed dike, since it has its own growing bank account earmarked for expansion of the perimeter. Kolobo's rice perimeter groupement is merely a recent remodeling of part of the village association. It is worth noting that Kolobo's rice warehouse project, another of its community initiatives, encountered a year's delay because of political factions squabbling over its location, a difficulty that, according to the secretary-general, has now been resolved. Though this particular problem did not affect CARE's work with the village, it indicates that such internecine disputes are not limited to the village of Kim.

In sum, in a region as diverse as the Kim area, a development agency cannot count on coming in with a one-size-fits-all project. Even though the area is not large, it is important to be sensitive to local differences in capacity to manage proposed activities and to tailor them accordingly.

Recommendation:

1. Be aware that projects must be responsive to the differences between villages. Make a point of staying attuned to what is going on in each and be willing to modify activities accordingly.

Issue: Managing large groupements for complex activities

The groupements with which CARE works in the Kim area range in size and complexity from the twenty to thirty women who agree to prepare a catchment basin together in order to raise vegetables, each on her own plot, to the irrigated rice perimeter groupements numbering well over a hundred, who must organize to maintain the irrigation canals and pumps and who therefore accumulate a considerable bank account and rice stocks from membership fees. Such matters as how often it is possible to call together a meeting of the entire membership and how much management must be left in the hands of an executive committee depend on the size of the group involved.

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~~organizations are in agreement on a common approach to development activities and reach a clear understanding concerning the basis for cooperation.~~

Recommendation:

Hold exploratory meetings with ARPES and CARE/Chad staff to see if there is a basis for cooperation and collaboration.

Issue: Addressing women's needs

While women have benefitted in several ways from CARE/Chad's activities, it is true that their voice in decision-making in the male-dominated rice groups is tends to be muted.

Some women who are widows do hold a parcel of the irrigated rice perimeter in their own right. In Djouman they numbered twelve among the 102(?) members of the rice group, a small, unassertive minority. Married women, though not members of the groupement in their own name, help their husbands with work on their parcels in the perimeters. Asked whether cultivation of these irrigated fields in addition to their usual ones increased their work load, one answered that, on the contrary, it decreased it: "Before, we would work the rainfed fields never knowing whether, in the end, we would get a crop out of them or not. If the crop failed, all our work would go to waste. Now, when we work in the irrigated fields, at least we know that our work will produce a harvest worth having, and we will have food for the family."

In addition to the rice perimeter groupements, CARE/Chad has also helped women (and some men, as well) to form and operate vegetable-growing groupements that have obtained the use of fields in catchment basins near the river that can be watered either by hand or by the use of hand or motor pumps--the women generally preferring to petition donors for the latter without much sense of the kinds of inputs and maintenance involved, for which their group would have to be responsible.

Like the irrigated rice fields harvest, women value vegetable production, first and foremost, for its contribution to their family diet. They are also pleased to supplement their incomes from sales of the surplus, for which there is enough local demand to absorb everything without resorting to shipping or transformation of the fresh produce.

~~Within their own groupements, women manage their activities without male help, but in the men's groupements they have more trouble making their voices heard. The women's groupement of Djouman faced this problem when they decided they wanted the rice group to heed their request for a dehulling machine. They decided not to work through their members who were also members of the rice group but to put their request together as emanating from the women's group as a whole. And they backed it up in a way the men could not ignore: "We told them that, after a day in the fields, it was too much work to come home and pound the rice for dinner, too. We told them we needed the hulling machine, and if we didn't get it--no more boule!" They got their machine.~~

From the perspective of outside donors it would, of course, be desirable to help women to stand up for their rights openly. But this has to be a long-range rather than an immediate goal if it is to be achieved solidly and permanently. In the short time an evaluation allows it was not possible to identify the means of going about doing this. Clearly, though, it is the women themselves who are the best advisors on how to proceed to make their needs known and to get satisfactory responses.

Recommendations:

1. Women place very high value on food security and on labor-saving. These should be recognized as project goals that are at least as valid as income generation.

2. Enlisting the advice and assistance of local women with leadership abilities and providing them with back-up support, through project staff and groupement backing, will facilitate their chances of making their needs known and their voice heard. Desirable as the goal may be, this is no place for the bull-in-the-china-shop approach.

3. Farmers or commercants marketing decisions. The evidence further indicates that existing marketing information systems, based primarily of word of mouth among traders and farmers moving from one local market to another constitutes sufficient information for marketing decisions to be made.

Recommendation

That the effort be discontinued. It is recommended, however, that the AMTT project focuses on the problem of national dissemination of price information using radio.

Issue. How to Dry Rice Under Local Conditions

Kim farmers have difficulties drying and subsequently storing their rice harvested during and immediately after the rainy season. Rice which has been stored in one of the groupement storage warehouses was examined and found to have some rice mold. This is due to the rice being stored before it could be dried to a point of 12-13 percent moisture.

There are several grain dryer models which have been tested and could be introduced on a trial basis. One is a solar dryer. It uses not fuel, can be made from local materials [wood, clay bricks] and will last for years. These can reduce rice from 25 percent moisture to 12 percent in a day or less. Small dryers usually hold eight to 11 kg for each square meter of drying surface. Plastic sheets are needed to cover the unit to protect it from rain.

Recommendation

A trial be undertaken to test simple dryers on rice. The VITA publication Manual Series No 35E, Preparing Grain for Storage, Lindblad and Bruben, is available to guide the effort.

Issue. How to Increase Rice Productivity

Rice grown in the Kim area is primarily IR46, a hybrid, whose potential declines over time if farmers use the seed repeatedly. In this case the original genetic characteristics have not survived. It was observed that the crop does not tiller well, has many sterile heads with associated lower yields. The yields now grown, 4 mt/ha are low by world standards. Fertilizers are not much used due to high cost and unavailability at critical times.

Recommendation

New better rice varieties must be attempted and provision made to provide fresh seeds annually. Legumes may be introduced to provide nitrogen and in part replacing nitrogenous fertilizers.

The concept of rotations should be introduced as well - to replace the present practice of planting rice on rice. There are several which could be attempted in rice perimeters using cowpea [a small niebe variety developed at Gassi would do]. One rotation could be rice-cowpea-rice. A second could be cowpea-cowpea-rice.

The test should be supervised by an experience agronomist. Over a period of 3-5 years yields of rice might increase by as much as 25-50 percent with out the use of fertilizers.

PVO Development Initiatives:
Lake Chad Agricultural Development and Farmer Training
Phase I
677-0051FH

Date of Authorization: July 31, 1991
PACD, revised, July 31, 1994
Date of Last Evaluation: None
Date of Next Evaluation: October 1992
LOB: Obligation: US\$2,570.8
Implementing Agency: ORT

I

A: Introduction

This project, the second of two implemented by ORT in the area, has several firm accomplishments to its credit. This evaluation looks at the accomplishments in place at the end of project activities in Ngouri and ponders their post-project sustainability. It is fair to say, however, that an important part of this success derives from solid accomplishments sustained in phase one - phase two has benefitted from the momentum achieved at that time. It is likely as well that important elements will survive the official end of the project although spread beyond the project area is improbable. The unexpected termination has been the result of seemingly endless local unrest causing project staff to be evacuated, project work suspended and project equipment confiscated. Although progress has been made there is legitimate concern for the safety of project staff, and project activities in Ngouri will end on the last day of December 1992. ORT hopes that a new site can be found where lessons learnt in the Ngouri project area can be applied during the remaining 18 months of its contract.

B. Project Background

1. Project Area

The project is located in the Ngouri sub-prefecture which lies to the east and north of Lake Chad. The project sites are situated along a 40km stretch of the road between Ngouri town [the sub-prefecture capital] and Bol. The activities focus on oasis-like dried up water courses called 'wadis'. These are depressions among surrounding dunes where groundwater lies near the surface. Farmers find it easy to rise water from the water table about

two meters using the traditional shadouf. In other areas the water table is five meters deep, which requires more complex methods to use.

2. Commercial Agriculture in Area

A sedentary agriculture based upon a mix of rain-fed cereal culture and cultivation of high value crops under irrigation in the wadis is widely practiced in the zone. Irrigation water has traditionally been supplied through the use of the shadouf, a human-powered low-lift low-yield device which can command about 15 percent of an acre. So much human energy is taken up in operation of this unit [two adults or one adult and a child], that little or none is left over, given all of the other demands, for weeding. Vegetables - onion, tomato, okra, hot pepper, egg plant - are grown for sale in local market towns and represent an important part of family income. Some of the onion cropped is dried for sale in more distant markets, off season, such as N'Djamena. Except for some seed varieties, no modern inputs are used.

II

A. Lake Chad Agriculture Development Project

1. Project Purpose:

To increase wadi food production in the Ngouri sub-prefecture, while maintaining or improving soil fertility; and

To identify models for increased wadi food production which will be replicable under similar conditions [other wadis, dry polders, and Lake Fitri].

2. Technical and Economic Problems Addressed by the Project and Strategy Adopted by Project

In 1986 a project design team identified the most important constraints to increased production in the wadis as [1] water availability, [2] water-lifting, [3] fencing and [4] maintaining soil fertility. This project was implemented by ORT and evaluated in 1990. It concluded that good progress had been made in addressing these technical constraints, a start had been made in introducing these innovations to farmers but that more time would be needed. Further, the experience underscored the importance of marketing as part of a total intervention to link extra income possible from sales to the acceptance of costly new technology, in

particular motor and animal-powered water-lifting devices known as bidons verseurs. A second phase was determined necessary to secure the achievements made and widen these to a larger number of farmers while promoting commercialization of high value crops.

The second, present, phase of the project included four activities: [1] development of a commercial input supply system based on local commerçants to serve wadi farmers; [2] develop profitable marketing techniques and strategies for wadi farmers for their high value produce; [3] dissemination of improved water-lifting and irrigation methods developed in phase 1, and [4] the dissemination of new technologies to complement earlier and ongoing production and marketing activities. The project directly targeted 650 households in 47 wadis over a three-year period.

B. Project Progress to Date of Evaluation

The project has been halted after only 18 months, due to continuing insecurity in the area. The expatriate team was completed in November 1991. Unrest in the area, however, has prevented them from establishing a permanent presence. As a result, they were not on site during both growing seasons. The local staff, however, has carried out the planned activities with punctual supervision of the technical assistance team.

1. Impact on Beneficiaries

Two comments must be made in connection with the impact on beneficiaries. First, it has become clear that agronomic practices introduced in an earlier phase - manuring, use of live fencing, etc. - are spreading autonomously in the project area and even beyond. Second, insufficient time has passed to register any impact upon numbers of farmers. Perhaps 300 or more farmers are believed to be using at least one new technique introduced under both phases. Extension has put in place different water-lifting technologies - donkey powered, motor powered, deeper lift tubewells.

The project has introduced storage techniques to help farmers to save harvested produce for later sale. The technology seems to be accepted and likely to spread. It has been found that both new varieties, and planting times and harvesting methods are as important if not more important than processing practices.

In addition, at least preliminary tests have been undertaken to improve packaging, selling off season, and

selling new crops under the project's direction. Final market prices have been provided on a regular if infrequent basis.

2. ORT's institutional impact in Ngouri

In addition to the new agricultural practices ORT has introduced, it is also leaving its mark on the institutional development of a region receptive to new ideas. This impact has been brought about through judicious guidance and management training of active groupements, through giving local "master farmers" technical training in skills ranging from techniques of raising seedlings and planting live windbreaks to using sludging methods to drill wells or repairing Honda motorpumps for the wells, and finally through wise choice and development of local project staff. All this constitutes forms of human capital it leaves in its wake.

The evaluation team was able to visit several groupements that had received ORT assistance. The first was a women's groupement, arising from a pre-project tontine, that had received the first grain mill in the area along with training in bookkeeping (another instance of comptabilité par symboles for unlettered women) and help in reorganizing to manage the mill efficiently. The second, a men's motorpump purchasing groupement, was also self-sustaining, with a stock of several pumps and 200,000 FCFA of spare parts so that it could respond promptly to requests for purchase or maintenance and could replenish their stock as needed. They had procedures for drawing up contracts and repayment schedules countersigned by the chef de canton that allowed them to conduct their affairs in a clear, business-like manner. The other women visited whom ORT had trained, a mother, daughter, and cousin fitfully engaged making tomato concentrate from over-ripe tomatoes in season were finding they had a product with only a week's shelf-life for which demand was as yet embryonic. At best, they were ahead of their time; realistically, if a project is to explore a range of possibilities, not every experiment can be expected to succeed.

A master farmer we interviewed was both a trained well-driller and a trained pump repairman. He had repaired two pumps the previous week--one which merely needed cleaning and one which required a part. His charges to his clients were reasonable (1000 FCFA and 2000 FCFA respectively), perhaps too reasonable, since they just barely covered his costs, which include hiring a farm laborer to replace him in his own field, leaving him a

mere 500 FCFA profit. As a well-driller, though, he had sustained the loss of tools mentioned and had been forced to leave off drilling for the past year until ORT replaced the tools last month. He now had a backlog of six requests to be filled as soon as possible. He was insistent on the need for a rolling fund to protect his group from another such catastrophe. If he can manage to keep equipped, he and his fellow trained workers constitute an enduring form of human capital, since, as he points out, he is a local farmer with his fields right there. He is not going anywhere else.

Farmers trained to give agricultural advice are less constrained by the need for capital equipment, but without links to sources of advice to keep their expertise up-to-date they will not be able to keep their edge. In the current situation those links are fragile, depending as they do mainly on SODELAC's continuing support.

Finally, the Chadian ORT staff members included several from the local area, the engineering expert among them, who are likely to continue to contribute directly or indirectly to the development of the region because of what they have learned during the life of the project. Some intend to seek employment elsewhere but at least one will continue to support his family through remittances. The engineer is exercising his considerable inventiveness and skill to come up with ways of reproducing at least some of the project's inputs with local material; he hopes to go into business with the well-drillers selling hand-pump wells, or possibly bidon verseurs, to farmers in the wadis.

3. Impact on women--and men

For women of Ngouri, as for men, the ORT project has given their groupements guidance in engaging in profit-making activities and has introduced appropriate local technologies that make their work easier, as well as the management techniques just described which will make mill operation sustainable. The women's milling group not only created a 'community chest,' it also meant that the task of transforming a koro of millet into dehusked and ground grain, which used to take half an hour of hard work with mortar and pestle now takes three minutes, and 25 FCFA, at the mill. As one man pointed out, "It's better for us, too. Now our wives have more time to help us in the fields or to turn a profit transforming onions or tomatoes that cannot be stored into dried products

that they can sell." The improved pumps have had an analogous impact on men's labor in their wadi systems; men can use time they would formerly have spent changing the heavy shadouf to increase their field size, weed, plant windbreaks, improve irrigation canals, and gain greater crop yields.

4. Cooperation with GOC Agency

SODELAC, a parastatal regional authority, has provided extension agents. The project has trained these agents and volunteer farmers [called délégués techniques] in various activities - agro-forestry, nursery management, land preparation, pest control, use of windbreaks, etc.

5. Effectiveness of Interventions Towards Purpose

Although it is too early to point to solid accomplishments a good argument can be made that the project would have reached its primary targets.

6. How has the Private Sector Been Affected?

It also appears that private entrepreneurs have begun to supply vegetable seeds, nursery pots, spare parts for pumps and pumps themselves. Local suppliers are able to meet the local demand for low lift pumps. Training has been given to entrepreneurs to make the donkey-powered bidons verseurs. A team is trained to drill wells and has the necessary equipment to do it. As a consequence of these it is reasonable to expect a growing number of farmers to be able to buy and maintain pumps. A motor pump credit group exists which is able to aid a number of farmers to buy them.

The well team has had the capacity to drill for over a year. They were unfortunate enough to have had their drilling equipment stolen a year ago and they have just received a new kit. They should be able to drill indefinitely or until some new misfortune occurs.

7. Particular Constraints

The most basic is security. The technically and socially promising area has been left only with reluctance. The second, and perhaps equal, constraint is the lack of decent roads. A road exists which is so deteriorated as to be worse than no road, though it was built only several years ago. As has been noted elsewhere price information, two or more days old, is available. Transporters, commerçants, relatives, travelers, etc. are

~~a routine if not always timely or reliable source.~~

D. End of Project Status and Sustainability

Senior local officials, the SODELAC and ORT personnel, indicated that they were confident that much of the technical interventions achieved will be continued. They attribute this to the clear suitability of the new technologies to their needs - they pay for themselves and earn extra income. Those technologies which are essentially one of technique - use of live fencing, use of organic manure, use of improved seeds, use of drying methods to hold onions for sale later in the season to earn higher returns - will be kept. It is argued that these practices may spread autonomously beyond the project area. The délégués techniques [a kind of master farmer who trains and demonstrates new technology to other farmers] will remain in place. It is conceivable they may assist in the spread of technology.

The project has trained a team of well-drillers and provided them with a basic work kit including galvanized pipe. They can drill as many as 100 wells with this basic endowment. But if the team loses its second tool kit drilling will stop again, unless the team has functioned long enough to have earned enough to replace the equipment.

The donkey-powered irrigation water delivery system may survive if ways can be found to repair the metal frame which holds the pulleys. At present the system is welded and no local welding capacity exists. Frames could be transported elsewhere for repair but this adds to the general problem of support. Project staff had helped to construct one system with a frame made partly of wood and bolted together. The system requires at most a young child to manage the donkey, freeing one adult for other work. Often, trained donkeys can operate the lift by themselves.

The motor pump is likely to survive because parts are available both in shops and with the farmers' groupement [who keep an inventory worth an estimated CFA 200,000]. Although no repair shop has been created in the area, six repairmen were trained by the project and, at this writing, provide repair services. Some pumps have been in service for several years and have been repaired at various times by them. It is possible that these persons will be able not only to maintain and repair pumps but to fabricate other devices. A case in point is the engine powered maize mill capable of milling 2.5 kilos per minute. The builder, a project employee, saw a prototype

while in Niamey for training. He reproduced the machine entirely from materials found locally. The motor pump requires almost no attention while in operation; farmers said they used the extra time available for weeding.

The motor pump technology is unlikely to spread because of its initial cost. Local farmers within the project area and members of groupements have access to credit from a revolving fund established by the project. This fund is sustainable if it continues to operate on a sound basis. It is unlikely, however, that a second fund could be established using only local financial resources.

A women's groupement trained by ORT is managing two mills provided under phase I. These mills save women at least 30 minutes daily from having to hand pound cereal. This technology more than pays for itself and can be sustained from local resources post-project. The women's groupement has used the profits from mill operation for other activities, such as creating a cereal bank.

A practical and cost effective system of onion drying has been introduced and is being copied by at least some farmers. There is no element in the system dependent upon external inputs of any kind. Farmers are sensitive to market opportunities at least in their market area [a radius of up to 100 km around Ngouri] and they have contact with commercants who come from even farther away. With the end of the project the prompt feedback in price information from N'Djamena will come to an end [being dependent upon the ORT office radio], though in due course the AMTT project is expected to provide prices by local radio. This will work to reduce the scope for marketing, but, so long as roads remain usable, will not fully cut the area off from wider markets.

III

A. AID Support for the Project

The project has not requested any special support from the USAID with respect to actual implementation of the project.

B. Linkages with other PVOs

There are no other PVOs which work in the immediate project area. ORT has collaborated with the 'Projet-Etude' Action in Doum-Doum--which is financed by the Swiss and had activities similar to ORT's (training, farmer-to-farmer visits).

C. Linkages with NGOs

There are no other NGOs active in the area.

D. Role of the Government of Chad

A Chadian parastatal, Société de Développement du Lac [SODELAC] is the implementing agency. SODELAC has provided extension personnel to assist in the training of the farmers.

E. Realism of Project Measures

The project design called for the introduction of 400 farmers to water lifting technology. The project now feels this was too ambitious, especially since the project continued to work in the same wadis as in phase I. Other examples include the bidon verseur: target 50, reality, 12; motor pump: target 90, reality 50. Some 300 watertaps were planned - only 21 achieved.

IV

Issues and Recommendations

Issue: Sustaining institutions that received project support

Up to now, ORT has made grants of some capital equipment--tools or, in one case, a grain mill--to get groups started, and it initially provided transportation for activities like well-drilling that would be otherwise unprofitable beyond a couple of hours' walking distance. ORT has also been the emergency cushion that allowed its trained well-drillers eventually to acquire a new set of tools after fleeing a rebel attack, abandoning their first set in the process.

What is still missing to assure the sustainability of certain project-initiated activities is:

- o a cushion of other assets that would allow some of these entrepreneurial groups to recover from unanticipated shocks or losses;
- o the links a master farmer needs to stay up-to-date in his area of training; and
- o possibly for some individuals, the managerial skills a single, small-scale entrepreneur needs to assess risks and engage in medium and long term

planning.

Recommendations:

1. USAID and ORT should weigh carefully the advantages and disadvantages of leaving certain types of small equipment behind in the hands of prospective entrepreneurs. It should assist them in fixing prices that enable them to begin to build up a revolving fund.
2. Since ORT will remain in Chad for another year and a half, regular visits to Ngouri to monitor what the population is actually able to carry forward on its own would be highly desirable.
3. Advice or a brief training session on considerations in small business planning might be helpful for participants, staff and farmers alike, who hope to privatise activities supported by the project up to now.
4. Examining the Ngouri site should be included in the scope of work of the final project evaluation, if security conditions permit.

Issue: Development links between PVO projects

The women's mill groupement in Ngouri has learned management skills for running a mill that would be useful to the women's groupement in Birdelep. Moreover, although that particular group did not purchase its mill, other groups in the vicinity, observing its success, have.

Recommendation:

The usefulness of a visit by representatives of the CARE/Kanem women's groupement to Ngouri is recommended in view of the situation seen from Ngouri as well as from Kanem.

Issue. Extension of Drying Technology - Onions

Based on the time limitations that ORT has been able to undertake its defined goal of increasing the income of wadi farmers in the Lake Chad region, physical evidence was exhibited in the storage and marketing of onions to take advantage of higher prices by testing and promoting off-season movement into the market.

The four techniques used in the trial storage of onions

~~have been closely documented and culling of those onions with onion smut or rot were removed on a weekly basis.~~

One aerated storage thatched hut where one farmer had stored his onions in the ORT project in his own storage unit recently sold his onions prior to the consultants visit. The ORT project farmer had stored his onions for a period of four months and had sold them at a price of CFA13,000 per sack. This price differs from the price of CFA3,500 the farmer would have obtained if he had sold them four months earlier immediately after harvest.

Recommendations

With the time remaining for the ORT project to remain in the Lake Chad area, it is recommended that members of the other PVO sub-projects make an effort to observe the well-documented and controlled trials for onion storage. Such trials have not been observed in all the sub-project areas. The trial where the stored onions were placed on a straw mat on aerated tiers inside the storage huts, were giving satisfactory results. All materials used in the units were readily available to the small farmer in his home environment.

Issue. Deepen Support for Bidon Verseur

Due to the limitations the higher priced motor pumps will have on saturating the requirements of those small farmers who will not be able to afford this advance in technology, the use, demonstration and training of artisans to promote the less expensive and highly efficient bidon verseur should be promoted in the other PVO projects where suitable. There are many of the wadi farmers who will be unable to afford either the motor pump or bidon verseur to increase productivity.

Recommendations

The bidon verseur, being less expensive and with a distinct advantage of the shallow water delivery system of the shadouf, should be given much more emphasis.

Although an artisan group has been thoroughly trained by the ORT project, there does exist an artisan in Ngouri who is capable of extending, promoting and selling the bidon verseur technology. Assistance should be extended to the Chadian ORT technician to extend this technology in any means possible.

Issue. Need for Follow-on Impact Assessment

It has been observed above that farmers have been autonomously adopting certain farm practices and the well-pump technology. Because these practices and technology can be made use of entirely independent donor support, and because they appear to pay, there is every reason to be optimistic that this spread will continue, including to areas beyond those directly touched by the project.

Recommendation

1. That post-project appraisal of farm practices be made within the next five years to study the extent to which they have been successful internalized by local agriculture and who in particular have benefited.
2. If and when the zone stabilizes, the area should be considered as a promising site for a future project.

Issuc. Opportunity to Test Biological Insecticide - Neem

Insect damage and crop losses to vegetable and grain crops take a huge toll in Chadian wadi's each year. The wadi farmer often will lose his entire crop after expending his labor and meager resources to produce a crop only to watch it destroyed by insects.

Integrated Pest Management [IPM] has been recommended for controlling various insects in wadi's and small grains being produced on sand dunes. Due to the high cost in organic and inorganic insecticides, including most PVO's and USAID's restrictions on their use, the approach to control insect pests is often the farmer's principal problem and most costly.

IPM as properly identified does not entirely exclude the judicious use of selected insecticides with low LD/50 or mammalian toxicity. Pesticides can include those manufactured from plant sources [botanicals] in nature.

Until some safe inexpensive insecticide of a botanical nature can be developed for controlling insects productivity increases due to other types of "shelf" technologies will not raise the level of production needed for a sustained income for these farmers.

Recently, there has been some interest in ingredients or a group of compounds [Azadirachtin] extracted from the neem tree [azadirachta indica] which shown control of various insects in Asia and Africa. Neem is widespread throughout Chad and the Sahel. Neem can also be utilized for fuel wood, shade, windbreaks etc. Azadiractin has received a non-food registration in the US for food crops and its registration for its use on food crops is pending with the FDA, with registration expected in 1993. The Africa Bureau, USAID, has funded several small projects to study neem as a botanical insecticide [AELGA project].

Farmers have had a difficult time with white fly, aphids, crickets and grasshoppers in Chad. In the Abeche area, several farmers that were contacted had replanted their tomatoes up to seven times due to being destroyed by crickets. There is some evidence that azadirachtin will control the above pests although more data is needed.

A method of extracting azadiractin as a cottage industry at the village level has been developed. The extract is prepared from the leaves and seeds of the neem tree and the insecticide can be applied using water as a carrier with a simple watering can.

Reference is made to, Review and Analysis of Neem Research and Development, Y.T. Belayment, USAID, Africa Bureau, Office of Technical Resources, Agriculture and Natural Resources Division.

Recommendation

Trials should be set up using neem extract at the village level. One method would be to dip the bareroot tomato plants prior to planting in the wadi to determine if azadirachtin will control crickets. If some degree of control can be determined, azadirachtin could find a needed place.