EC funded

MID TERM EVALUATION

OF THE

AGRICULTURAL REHABILITATION AND DIVERSIFICATION OF HIGH POTENTIAL IRRIGATION SCHEMES (ARDOPIS)

IMPLEMENTED BY

FAO AND CEFA

OSRO/SOM/510/EC and OSRO/SOM/511/EC

EVALUATION REPORT

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LIST OF ACRONYMS USED

EC	European Commission
ARDOPIS	Agricultural Rehabilitation and Diversification of High Potential Irrigation Schemes in Southern Somalia
CBNRM	Community Based Natural Resource Management
CEFA	Comitato Europeo La Formazione L'Agricoltura
FAO	Food and Agriculture Organization of the United Nations
FSAU	Food Security Analysis Unit (FAO implemented, EC main donor)
IDPS	Internally Displaced Persons
IS	Institutional Strengthening
M&E	Monitoring and Evaluation
OD	Organizational Development
PACSU	Project Assistance, Capacity Building and Supervision Unit
PCM	Project Cycle Management
PLA	Participatory Learning and Action
PRA	Participatory Rural Appraisal
SHARP	Shabelle Agricultural Rehabilitation Programme
SISAL	European Commission Strategy for the Implementation of Special Aid in Somalia 2002 – 2007
SWALIM	Somalia Water and Land Information Management System (FAO implemented, EC funded)
WUA	Water Users Association

EXECUTIVE SUMMARY

Agricultural Rehabilitation and Diversification of High Potential Irrigation Schemes in Southern Somalia (ARDOPIS) is an EC funded initiative being implemented by FAO in partnership with CEFA and Agrosphere. FAO and CEFA are implementing the project in the Lower Shabelle Region in Merka and Qoryooley districts. FAO has commissioned Acacia Consultants Ltd to undertake the mid-term evaluation the project. The evaluation was commissioned to assess the performance of the ARDOPIS. The report provides a technical, physical and socio-economic assessment of the intervention as implemented by FAO and CEFA.

Project Design and Formulation

Through participatory planning, plans for rehabilitation of flood fed irrigation system; crop production and marketing were to be developed. Off-takes, canals, pipes and in-field systems were to be rehabilitated to allow water use on approximately 23,170 hectares (ha) of irrigable area that provides livelihood to at least 10,000 farm families. Market and flood warning information was designed to be shared with farmers to ensure appropriate actions are being taken. Capacities of local organizations were to be developed for input supply, marketing and other support services.

The project was planed to cost € 2,972,832.36 of which € 2,750,000, which represents 92.5 percent, was funded by the EC while the balance would be provided by FAO and CEFA. ARDOPIS implementation was scheduled to take 24 months starting from 1st January 2006.

Overall Objective and purpose of the project

ARDOPIS overall objective is "Households incomes of rural families increased through improved agricultural production". The achievement of this overall objective was to be measured on realization of the following objectively verifiable indicators:

- Household incomes of rural families increased by at least 15% compared to incomes before action implementation.
- At least 75% of the target farm families undertake improved agricultural production.

Purpose:

"Farmers in the former banana growing regions have access to and use irrigation infrastructure in a productive and appropriate way" is the main purpose of the ARDOPIS project.

Evaluation Methodology

The main methodology applied was the review of the project documents, interviewing key resource persons in Nairobi and in Somalia and the targeted beneficiaries within the project area. Fieldwork visits and validation interviews with the administrations and the contractors were conducted. In addition, in preparation for interviews with targeted households, the evaluation team had developed some semi structured questionnaires mainly to assess change brought by the project, especially in crop production, by FAO and CEFA irrigation rehabilitation and the associated interventions.

Relevance of the Project

The project was found to be relevant as depicted by the following evaluation findings:

- The ARDOPIS implemented by FAO and CEFA in the districts of Merka and Qoreyooley of the Lower Shabelle Region, seeks to contribute to the reduction of poverty among the rural families in the project area. This objective is very much in line with EC Strategy for the implementation of

Special Aid in Somalia (SISAL) of " contributing to the alleviation of poverty and to the promotion of a more peaceful and democratic society of Somalia" as its goal.

- Improved practice in agricultural husbandry and intervention in improved seed quality and diverse crop varieties and types have the potential of improving the overall performance of agricultural production. Farm produce market interventions will not only guarantee a sustained market oriented production but emphasis will also be put towards production to ensure food security.
- However, the fact that the target community is agro-pastoralists, the component of improvement of livestock production is not sufficiently catered for. In addition, lack of intervention in supporting provision of essential farming inputs, was noted to prohibit poor households from reaping the gains associated with access to irrigated agriculture.

Efficiency of Project Implementation

Although the project is progressing well and likely to accomplish rehabilitation work on time, including the no-cost extension period, the efficiency in transfer of skills and knowledge may not be satisfactorily achieved.

According to the project documents, implementation of ARDOPIS had been planned to start on January 2006, however, the project actually commenced on June 2006. Various factors which are largely attributable to *force majeure* were identified as the cause of the delay. These include: a) **Insecurity:**-Somalia is a volatile area and insecurity issues are ever recurring; b) **Flooding:** - the project area was affected by floods in 2006 rendering it inaccessible.

The budget summary generally presents conformity of the actual project implementation expenses with the budget. The grand variance percentage of 22 does not divert far from the remaining activities implementation which this study estimates to be less than 25 percent. Contract awarding system, implementation monitoring by the CEFA technical staff and the community, together with completion of works certification, must have contributed to strict adherence to the budget by all parties involved in the implementation process. This is strongly recommended to continue, if the activities lined up for completion in the no-cost extension phase are to be effectively catered and remain within the budget.

Effectiveness of the Project

The project is likely to be effective in delivering the objectives as designed as indicated below:

- As a result of rehabilitation of canals interventions, cultivation activities within the area under the command of Bakoro canal, which has been lying idle (no cultivation activities unless by riparian farmers of Shabelle River) for the past six to seven years, is now virtually under crop production. According to data collected from the seventeen households interviewed who were drawn from all the 16 villages within the Bakoro canal command area, only about 6 percent of the entire population which has not resumed crop production. The probable reason could be the cost of inputs including ploughing which farmers reported to cost about $30 per hectare and other related costs.
- The farmers training module is broad and comprehensive touching on both the organizational development aspects (OD) and institutional strengthening (IS) aimed at strengthening the managerial aspects of farmers' groups. Further, the training module is detailed on the agronomic aspects, O&M of the irrigation systems and marketing component. Another effects arising from training is the aspect of enhanced community mobilization and organizational capacity which is directly associated with capacity building as farmers are being organized to manage and maintain the irrigation system.

Other effects of the training include:

- Improved use and productivity of the water resources,
- Diversification of crop types and varieties (as can be observed from Table 2, Page 18),
- Effective of use of land resources, and

- Improved market connectivity and linkages

Impact of the Project

- From the crop production activity, household food security will improve as well as incomes. It is observable that the farmers' strategy is both to achieve food sufficiency as well as growing for market. The former, appear more significant with many more farmers involved in cereal production as compared to horticultural farming which is essentially for commercial purposes
- Potential for market improvement has been demonstrated. To promote farmers' income, the project carried out market survey from which a trading partner, Al-Mizan Regional Company, has entered into a contract with 190 (60 women and 130 men) farmers of Bakoro canal.
- Potential for replicating the project are positive. One of the strengths of FAO and CEFA is documentation of implementation activities. Lessons learnt and experiences are recorded in their biannual progress report.

Sustainability of the Project

The foundation for sustainability is based on strategies that strengthening the community governance structures and technical training on O&M of the irrigation system thereby empowering them to repair and maintain the infrastructure internally. The training process is ongoing. In addition, although, no empirical data as some of the vital significant impacts of the projects are yet to come by, the expected income derived from the food diversification and the fact that farmers have been trained on financial mobilization, savings for irrigation system maintenance should be possible. However, it should be noted that the sustainability of the irrigation development in the region will largely depends on a reliable source of water and the control of flooding during high river flows. Also ability to manage issues related to drainage and salinity problems, and is lacking, is important for sustainability of project. Other measures that need to be put in place include institutional management organization, capable of operating and maintaining the irrigation systems and other features along the river through out the year.

Key Lessons Learnt

- The breakdown of the irrigation system in the project area denied former banana growers a significantly important source of income. Rehabilitation of the canals by FAO and CEFA is gradually restoring livelihoods. The benefits associated with this activity have created an important impetus in community to ensure the canals are maintained. Farmers reported their readiness to save (and to be saving) some of the money earned from the sale of crop yields purposely to build a fund for irrigation system maintenance. Farmers interviewed confirmed their agreement to start off the maintenance kitty once they have made their first harvest.
- Strengthening of the existing community governing structures, other than creating absolutely new structures, will pose a lesser challenge of popularising it amongst the community and other stakeholders, especially the administration. Transaction costs will be low as stakeholders understand roles and responsibilities of traditional structures upon which project management committee are drawn.
- Increased crop production will result to improved health and income of the farmers' families. Currently only a very small, proportion of farmers who have made some harvest. For instance, only 3 farmers, representing about 18 percent of the Bakoro canal farmers who have obtained some yields.
- Improved access to water resources for irrigation, domestic and livestock consumption will encourage settlement growth in the canal command areas.
- Increased population is likely to impact negatively to environmental integrity including the resource base if no intervention towards protection of the environment.

Conclusions and Recommendations

With the breakdown of the canals as a result of the collapse of the central government of Somalia in 1991, many of the former banana producers of Lower Shabelle Region lost a major livelihood mainstay. Rainfall pattern and distribution within the *GU* (April, May and June) and *Deyr* (October, November to December), at annual amount of 500 mm is insufficient to support rainfed farming. Data analyzed by FSAU (2007) from satellite images and field reports confirm that in the Middle and Lower Shabelle Regions, many areas received only 10-20 percent of the normal *Gu* rains. The project is likely to enhance livelihoods and reduce poverty and subsequently conflict in the area. It is therefore recommended irrigation investment be enhanced to reduce poverty and increased social harmony.

Success of the community institutions will to a great degree depend on the performance and capacity of the administration to manage conflict arising from common utilization of resources that the community may not resolve by their own. *In this regard, it is recommended the projected extension be increased form current three months to six months to allow for skill building among the beneficiaries.*

Environmental conservation through pre-investment in environmental impact assessment and follow-up plans for new irrigation projects and canals should be instituted. The project should institutionalize environmental awareness creation in the remaining project implementation phase.

Firstly, there is the need for the project to initiate an information sharing mechanism linking farmers with key stakeholders including potential traders/ consumers of the farm produce. Agricultural growth should occur through improved technology and productivity. It should be supported by an enabling macro-economic environment and investment in infrastructure and human capital, and attention be given to gender and environmental issues.

Monitoring and evaluation: These are important elements in Project Cycle Management (PCM). The aims of both monitoring and evaluation are to improve the overall management of projects and to enhance their performance by providing information and feedback on the implementation and the performance of the projects to all parties. CEFA should develop a monitoring and evaluation plan before the closing of the project and have time to try it out together with the beneficiaries to ascertain its effectiveness.

Overall, the ARDOPIS PROJECT CEFA component is on course and performing as envisaged by logframe. The consultant is of opinion, there is no need to amend or add new items on the logframe. It is recommended the logframe (see Annex 3, Page 65) remain as planned and be used effectively to support project implementation.

1.0 BACKGROUND OF THE PROJECT

1.1 Introduction

ARDOPIS Project is an EC funded initiative being implemented by FAO in partnership with CEFA and Agrosphere. FAO and CEFA are implementing the project in the Lower Shabelle Region in Merka and Qoryooley districts. Merka is the main operational base and is the official location of the project offices and residence for expatriate staff while Qoryooley sub base is an important contact point for target farming community in the district. The main target group of the project are farmers practising irrigated farming, and traders in fruit, vegetables and other agricultural produce and agriculture input merchants.

The project Mid of the Term Evaluation was commissioned by FAO and CEFA to assess its performance. The report provides a technical, physical and socio-economic assessment of the intervention as implemented by FAO and CEFA.

1.2 General Information to the Project area

1.2.1 The Shabelle River

Lower Shabelle Region is mainly drained by the Shabelle River system which originates from Ethiopian highlands near the town of Yirgalem, some 250 km south of Addis Ababa. It flows at first in the direction north east for some 325 km, and then turns south east for about 650 km to the international boundary with Somalia, 30 km north of Belet Wein. The course of the river then passes south through Bulo Burti, Mahaddei Uen and Jowhar to Balaad, where it turns south west and runs roughly parallel to the coast from which it is separated by a range of sand hills about 25 km wide. After passing through Afgoi, Awdegle and Qoryooley, the River flow into the first of three swamp basins that extend to Avai. Below Avai the river resumes a defined channel but the flow is much reduced and it is only in seasons of exceptionally high flows that the water discharges into the Juba River at the confluence south of Cansuna and from there to the Indian Ocean at Kismayu.

1.2.2 Climate

The climate of the river Shabelle valley ranges from tropical Semi-arid near the coast to tropical arid in the upper reaches of the Ethiopian boarder. Annual average rainfall is about 500 mm in Jowhar, Balaad, and Afgoi and Janale areas and decreases northwards to about 200 mm at Belet Wein. The rain is very variable in amount from year to year and is distributed in two distinct seasons associated with the passing of the inter-tropical front.

In the vicinity of Balaad, Afgoi and Janale, the wet season occurs in April to May and October to December locally called the “Gu” and the “Der” seasons respectively. In addition, coastal showers locally called “Hagai” rains occur during the month of July to August, amounts being greatest near the coast so that Janale receives about three times and Afgoi about twice as much as Balaad during these months. North of Jowhar the rainy seasons are of shorter duration and rainfall in the “Hagai” season is negligible. At Belet Wein, the “Gu” rains occur in April-May and the “Der” rains October-November only.

1.2.3 Topography

As has been mentioned earlier the Shabelle River originates from the Harar plateau at an altitude of 2680 m (above sea level) from where it descends to the Audamboi plain in southern Ethiopia and crosses the international boundary at an altitude of 300 m. At Bulo Burto in Somalia the river flows in closely confined channel with a narrow flood plain, which broadens, becoming flat and featureless and is dissected by River channel remnants. The plain is bounded to the south by the coastal range of sand hills and extends south west to the confluence with River Juba.

1.2.4 Geology and soils

In the area between Jowhar and Balaad, the soils adjacent to the River are grey vertisols with entisols on the recent river alluvium. They are non-saline and suitable for irrigation although difficult to manage than the vertisol soils above Jowhar. From Balaad through Afgoi and Janale to Qoryooley, the river is bounded on both banks by a wide expanse of fine textured non-saline brown vertisol soils, which extend beyond Qoryooley, south of the swamp basins. The soils adjacent to the swamp areas downstream of Qorioley consist of saline grey to brown vertisols.

1.2.5 Hydrology

The Shabelle River flow ranges from 10 cumecs to 380 cumecs at Belet Wein gauging station. In general the high flows in the “Gu” flood that occur from April-May are of short duration while in the “Der” flood, during August-December, the high flows are usually sustained. The low flow period with the flow less than 10 cumecs is usually of about two months but can extend up to five months or in a good year, may last less than two weeks. The inflow to the river from the catchment in Somalia all occurs between Belet Wein and Bulo Burto and account for approximately ten percent of the total annual flow.

1.2.6 Flora and fauna

The vegetation of the area consists of grass, thicket (Dichrostachy glomerata) and tree species (Acacia nilotica; A. nubica; A. seyal; Commiphora species; Cordia gharaf; Dodera glabra; Grewia spp; Euphobia spp and Salvadoria persica). Prosopis julifrola popularly known as “Mathenge” in Kenya and in Somalia as “Rambow” is also spreading fast and is covering most of southern Somalia. It is a good source of firewood and is also used as fuel to make lime chalk. However it has also been blamed for its poisonous thorns that have been harmful to both people and livestock.

Livestock production is the predominant livelihood in Somalia with an estimated three quarters of the population obtaining the subsistence needs from camels, cattle, sheep and goats. The Shabelle and Juba Rivers provide an important dry season buffer to pastoralist, especially in times of drought when most sources of ground water are depleted. Due to the destruction of the environment by charcoal burners, wildlife have more or less disappeared but you find hippopotamus, some types of fish mainly the mud fish and crocodiles in River Shabelle.

1.2.7 Water resources

Somalia is largely an arid or semi-arid country with irregular rainfall and water resources vary in quality and quantity according to location. In southern Somalia water is obtained from Rivers and shallow wells.

Extensive permanent swamps and floodplains occur on the lower Shabelle River which ends up in a swamp. The Juba and Shabelle rivers are the only two large perennial rivers that rise from the Ethiopian highlands and flow across southern Somalia. They are both important sources of water for domestic consumption, irrigation and livestock. The area between the two Rivers is the country's main rain-fed agricultural zone.

1.3 Socioeconomic Environment

1.3.1 Population of the Lower Shabelle Region

The population of the Lower Shebelle region was estimated in 1995 at 616,000 inhabitants, (urban 17%, rural 60%, and nomadic 23%). In 1989, it was reported that the rural population lived in 715 villages and the number of farms was about 70,000 of an average size of 2.7 ha. Out of about 200,000 hectares (ha) of arable land, 40,000 ha were irrigable while 112,000 ha were under rain fed crops. As shown in figure 1, Merka had 300,000 persons in 2004 while Qoryooley, which make up the project area for FAO and CEFA ARDOPIS project was 150,000 in accordance with FSAU 2005.

1.3.2 The Internally Displaced Persons (IDPs)

In spite of the lawlessness that characterizes the country since the collapse of the Somalia government in 1991, it was reported that the sedentary population in the Shebelle region has largely remained stable. Due to control by the clans there was no heavy permanent influx of immigrants from other regions. But many of the workers' villages that were sited on the commercial farms have been abandoned, partly because of the lack of work and because of the collapse of the canal system preventing drinking water reaching them. Most of them moved to small towns like Janaale, Shelembot, Qoryioley and Golweyn as well as Merka. With rehabilitation of these canals, like the Bakoro, considerable numbers of households who had left the village are returning to undertake irrigated crop production.

In the recent past, as a result of intense and sustained fighting in Mogadishu since last year pitying the Transition Federal Government (TFG) and the Islamic militia, residents have been moving from the city and settling in villages and trading centres throughout the project area. Although this study did not establish the estimate of the internally displaced persons (IDPs) population that has so far sought refugee in the project area, the presence of numerous temporary settlements scattered over the project area suggests that the IDPs population is big. This will definitely exert pressure to the existing water resource and land use' besides environmental and sanitation problems.

1.3.3 Employment

Changes in land use, cropping pattern and employment are direct consequences of the break-down of the banana industry, leaving the large banana-work force without employment. The progressing deterioration of the canal network forced the farmers to reduce their irrigated crops and larger areas are returned to rain fed cultivation, on small and large holdings alike. The farming community attaches the highest priority to the improvement of the irrigation system and has demonstrated active cooperation and commitment.

1.3.4 Authorities and Governance

As reported earlier, lack of a central government has led to insecurity in many areas of South Somalia. However, Merka and the surrounding areas are relatively safe at the moment although most vehicles travel with armed guards. The Islamic Court union that controls Mogadishu has influence over the Shebelle region. Traditional council of elders, as well as religious sharia courts has a role in maintaining law and order. Otherwise the nearest approach to institutional organization in the area is the farmers committees.

1.4 Project Design and Formulation

The three partners implementing ARDOPIS, namely FAO, CEFA and Agrosphere have individually been collaborating with EC Somalia for more that ten years in agricultural development of Southern Somalia. A series of actions funded by EC Somalia have gathered data which is kept under Somalia Water and Land Information Management System (SWALIM), bulletins and food security situation in Somalia produced by Food Security Analysis Unit (FSAU), rehabilitation of agricultural infrastructure including irrigation canals, river embankment and farmers training in appropriate crop production by both CEFA and Agrosphere. Implementation of ARDOPIS was expected to support rehabilitation of irrigation systems through farmer organizations and development of sustainable market oriented farming. Through participatory planning, plans for rehabilitation of flood fed irrigation systems; crop production and marketing were to be developed.

Off-takes, canals, pipes and in-field systems were to be rehabilitated to allow water use on approximately 23,170 ha of irrigable area that provides livelihood to at least 10,000 farm families. Market and flood warning information was designed to be shared with farmers to ensure appropriate actions are being taken. Capacities of local organizations were to be developed for input supply, marketing and other support services.

The project was planed to cost € 2,972,832.36 of which € 2,750,000, which represents 92.5 percent, was funded by the EC while the balance will be provided by FAO, the ARDOPIS project applying organization. ARDOPIS implementation was scheduled to take 24 months starting from 1st January 2006.

1.5 Overall Objective and purpose of the project

ARDOPIS overall objective is “Households incomes of rural families increased through improved agricultural production”. The achievement of this overall objective was to be gauged upon realization of the following objectively verifiable indicators:

1. Household incomes of rural families increased by at least 15% compared to incomes before action implementation.
2. At least 75% of the target farm families undertake improved agricultural production.

The above indicators will necessitate the carrying out of two baseline surveys the 1st prior to the start of action implementation and the second three months before end of action. The baseline survey will focus at household income levels, sources, their livelihood activities, and factors influencing these livelihood activities. Livelihoods approach to be adopted for the survey emphasizes on livelihood assets (physical, natural, financial, social and human) and livelihood strategies (strategies of accessing food and income, coping strategies, expenditure patterns and coping with the dynamic environment). Together with the focus of increasing rural based incomes through improved

agricultural production this action will address the pertinent issue of the poverty reduction as envisaged in the Millennium Development Goal number 1.

Purpose: "Farmers in the former banana growing regions have access to and use irrigation infrastructure in a productive and appropriate way."

In addressing productive and appropriate ways of use of the irrigation infrastructure this action will lay great emphasis of environmental sustainability and address pertinent issues highlighted in the Millennium Development Goal number 7. It is noted that this purpose has been identified during the implementation of SHARP through participatory processes between the communities and the implementers as a critical area of focus if agricultural production in the irrigated areas of southern Somalia is to be improved. The proposed purpose is also relevant to the EC Somalia strategy SISAS. FAO and implementing partners will ensure that the following objectively verifiable indicators are realised.

1. 4 sub-command irrigation systems in Merka and Qoreyooley districts with a total of 23,170 ha rehabilitated during the project period.
2. At least 3,000 farm families have improved agricultural production through use of irrigation and diversified cropping during the project period.
3. At least 3,000 farm families practice improved soil and water use and management during the project period.
4. At least 1,000 farm families practice market-oriented farming for 2 seasons targeting local and export markets during the project period.
5. At least 5,000 farm families receive services from strengthened relevant organisation and administration.

The above indicators will necessitate carrying out of status quo survey of the irrigation infrastructure. This status quo survey will detail the current area under partial or full irrigated agricultural production, existing serviceable irrigation canal network, and water availability in time and quantity at farm level. During action implementation the progress to achieving the above indicators will be used to gauge the action performance in converting the availed resources to an improved irrigated agricultural economy.

It is expected that at least 82.3[1] km of canals will be rehabilitated through availed project funding; in addition farmers will be expected to open all the secondary, tertiary, group feeder and farm feeder canals. A final tally of kilometres of canals opened due to project intervention will be made before the end of the project.

Expected Results:

Selected Irrigation Systems are Rehabilitated and Functional

Indicators for this result will include:

- Kilometres of primary canals rehabilitated
- Kilometres of secondary canals rehabilitated.
- Kilometres of farm access roads rehabilitated.
- Number of barrages rehabilitated
- Number of hectares irrigated under rehabilitated irrigation system.
- Real-time spatial data collected by the action and shared with SWALIM on spread, quantity and/or quality of soil and water resources and the local demands.

[1] This was the total length of the canals that the PRA had identified. However, actually implementation aims to rehabilitate a total of 34.15 (Bakoro canal 15.85 km; Fornari, 6.3 km; and Liban, 12 km.

2.0 FINDINGS AND DISCUSIONS

2.1 General Overview

Since the breakdown of the central government in the early 1990s, infightings, mainly clan based have dominated and pervaded much of Somalia both in the rural and urban areas. Insecurity and the related resultants have been a major bottleneck to smooth implementation of the ARDOPIS project. Although risks of renewed large scale conflicts, like the ones that characterized the country in the 1990s is low, increased localized conflict are sporadic and harmful to people's livelihoods and endeavours to gain social basics. The instability and insecurity in Mogadishu and the surrounding areas since early 2007 has by far had had far reaching effects to the progress of the ARDOPIS progress including difficulties in implementation and follow up of the project activities, uncontrolled influx of the refugees running from Mogadishu to the immediate rural areas, especially Lower Shabelle and subsequent growth of IDPS.

It is under this volatile and dynamic context that the ARDOPIS project is being reviewed.

2.2 Relevance of the Project

2.2.1 Relevance of ARDOPIS to EC Programme

The ARDOPIS is implemented by FAO and CEFA in the districts of Merka and Qoreyooley of the Lower Shabelle Regional, and its goal at the project area will no doubt contribute to the attainment of the EC goal for Somalia. In ensuring project sustainability, ARDOPIS has embraced and underlined the importance of involving the target community, organizing, developing the capacity of and building community based institutions to manage irrigation infrastructure and coordinate marketing of farm produce. This perfectly matches and contributes to the main objective of EC programme interventions of strengthening livelihoods at household level and support State and non-State actors through smallholder market oriented agriculture and livestock development, increase capacity of Somalis for decentralised management and create an enabling environment for re-integration of ex-combatants, IDPs and returnees as the new Government becomes functional.

Further, a consensus emerged in Europe that new post-Lome cooperation agreements (between 71 African-Caribbean-Pacific (ACP) states and 15 member states of the European Union) should ensure that poverty alleviation is the cornerstone of the new partnership. Moreover, the Libreville Declarations adopted by the first Submit of the ACP Heads of State and Government in November 1997, specifically referred to the need to reinforce human capacity in the agricultural sector in view of its key role in reducing poverty and promoting socio-economic development (CTA, 1998).

2.2.2 Relevance at Identification of Target Group Needs

According to the FAO-CEFA's project report, the point of departure of the intervention was determined through and during PRA/ PLA sessions which were held with the community members from the target areas. During these participatory sessions, community members were facilitated to identify and set out their priorities for the project interventions. Similarly, the sessions were crucial in building and determining the communities' commitments to the project.

For instance, the Project Progress Report (1st March to 31st January 2007) indicate that ten participatory sessions had been conducted before and during excavation of Bakoro canal. This is in line with PCM which underlines the need for undertaking a need assessment of the target community

to ensure that the project has come out of what people say they want and not from the assumptions of the development agency.

2.2.3 Relevance of the ARDOPIS's Strategies, Activities and Approaches

ARDOPIS strategies, activities and approaches are described below in regard to the actual rehabilitation of the irrigation system as a strategy to revamp agricultural production, crop diversification as an intervention to improve seed quality and as strategy to enhance crop production performance and finally capacity building as a long-term approach of ensuring governance, institutionalization and irrigation system maintenance:

2.2.3.1 Rehabilitation of Irrigation Systems and Promotion of Crop Production

With collapse of the Somalia Government in 1991, virtually all public infrastructure and facilities have been run down. The irrigation infrastructure in the former banana production area of the Lower Shabelle Region was not spared either. According to field observations, where canals are not functioning, irrigation is only possible for the farms lying along the river or by richer farmers who are able to irrigate using pumps. Either way, only a small proportion of the community members are able to irrigate their lands. Yet, Somalia is a food deficit country and "improved agricultural production would not only benefit the smallholder families living in the action target irrigation farming areas, but could provide surpluses to improve food security in the country as a whole, as well as reducing import requirements"[2]. The annual mean rainfall is about 500 mm spread over *Gu* (April, May and June) and *Deyr* (October, November to December) seasons. Data analyzed by FSAU (2007) from satellite images and field reports confirm that in the Middle and Lower Shabelle Regions, many areas received only 10-20 percent of the normal *Gu* rains, thus irrigation is necessary. Rehabilitation of the canals, including repair of other related structures culverts, intakes, cross regulators, off-takes and access roads and cross regulators on Bufow canal (Cessare Maria), will ensure access to irrigation water to substantial number of households within the canal command area.

2.2.3.2 Improved Agricultural Production and Diversified Cropping

Improved practice in agricultural husbandry and intervention with improved seed quality and diverse crop varieties and types have the potential of improving the overall performance of agricultural production. Farm produce market interventions will not only guarantee a sustained market oriented production but emphasis will also be put towards production to ensure food security. Both local and international markets are being sought and secured.

However, the fact that the target community is agro-pastoralists, the component of improvement of livestock production is not sufficiently catered for. Although promotion of fodder and forage crops has been remotely mentioned as one of the activities, the evaluation team feels that livestock production is a major livelihood activity. Further, livestock production needs to be well integrated with crop production for sustainable management of soil fertility and as a strategy to discourage application of chemical fertilizers.

In addition, lack of intervention in supporting provision of essential farming inputs, was noted to prohibit poor households from reaping the gains associated with access to irrigated agriculture. Incidences of poor farmers renting out their farm plots to better off households were encountered.

[2] European Community Contribution Agreement with an International Organization, 2004.

2.2.3.3 Capacity Building and Institutionalization

This activity involves strengthening of local institutions, which includes canal committee, water users associations, water pan committees, village committees and contact farmers. Capacity building focuses on organizational, managerial and technical skills.
Organizational and managerial skills are to deal with aspects of discipline, cohesion and conflict resolutions amongst user groups of the canal command area. Technical skills are to do with empowering of community to take more responsibilities over the canal maintenance and operation needs. During the construction phase, the technical skills will help the community through the canal committees to monitor the performance of the contractors hired to excavate and rehabilitate major structures of the irrigation system. Empowering farmers by facilitating their access to resources, markets and services, will enable them participate fully in the agricultural production resulting in increased food production and incomes.

2.3 Efficiency of Project Implementation

2.3.1 Timeliness

According to the project documents, implementation of ARDOPIS had been planned to start on March 2006, however the project actually commenced on July 2006. Various factors which are largely attributable to *force majeure* were identified as the cause of the delay. These include:

- **Insecurity:**-Somalia is a volatile area and insecurity issues are ever recurring.
- **Flooding:**- the project area was affected by floods in 2006 rendering it inaccessible and virtually difficult to carry out any meaningful activities until in mid 2006

- Other delays were reported to be caused by:
    a. **Local Vendors**- this mainly involves payment to the contractors. On receiving payment demand note, FAO process the payments and pay vendor representative in Nairobi to pass over the money to the local vendor in Merka. Frequently the money get delayed a long the way. This is usually a concern brings about poor working relationship between the contractors and the administration at the field office. According to the field report, it is particularly difficult to adhere to the week payment basis as subscribed in the contract as the time is not sufficient for technical assessment of the works and payment processing.
    b. **Breakdown of the machinery**: - most of machineries used are in dire need of repair. The process of repairing once breakdown occurs is wanting as most of the parts have to be sourced from the volatile Mogadishu.

The difficulties associated with Somalia context not withstanding, CEFA and FAO have made remarkable progress within a span of roughly eighteen months. Out of the three canals which were earmarked for rehabilitation, namely Bakoro (15.85 km), Fornari (6.3 km) and Primo Secondario (35 km), Bakoro and Fornari canals with all its corresponding structures, has successfully been completed and functioning well. There are immediate crop yields recorded by most farmers following the canal rehabilitation at Bakooro which was completed in October 2007. Similar developments are expected to take place within Fornari canal command area which was finalized in the month (April 2008). Primo Secondario canal, measuring 35 km was rehabilitated by the community mobilized by the local administration. As an Alternate, the community members were facilitated to prioritize another canal for rehabilitation and they picked Liban (12 km) which has since been surveyed and designed. It is due for rehabilitation and completion during the requested three months of no-cost extension phase.

In addition, CEFA and FAO experienced challenge in securing and maintaining professionals in Somalia staff. High turnover of human staff not only caused the delay, but also inconsistence in implementation of activities.

2.3.2 Economy and Financial Resource Utilization

This sub section seeks to establish whether or not the project expenditures are in line with the projected budgets and costing.

As it can be observed in the Table 1, below, the budget summary generally presents conformity of the actual project implementation expenses with the budget. The grand variance 22 percentage does not divert far from the remaining activities implementation which this study estimates to be less than 25 percent. However, it should be noted that by replacing Primo Secondario canal measuring 35 km with the 12 km long Liban canal means reduction of the length to be rehabilitated by 23 km in the absolute terms. This should have translated into savings from the shortened period of equipment hiring and total number of days injected in the project for excavation. According to FAO, the cost of fuel that continue to skyrocket, the high rate of inflation and general increase in cost of inputs, has exhausted all the gains that could have been realized with reduction of the length of canals to be rehabilitated. Additional explanation to variance in the budget planned and the actual expenses has been provided in the table. It should be noted that this budget only reflect the money released to CEFA by FAO.

Accountability relates to the situation where financial transactions are recorded, authorised and approved in an accountable and transparent manner. The capacity of CEFA to absorb the funds and implement the project within the budget and contract period is an indication of their ability to plan, design and implement the project. This has to be backed by good technical and financial accounting systems. Contract awarding system, implementation monitoring by the CEFA technical staff and the community, together with completion of works certification, must have contributed to strict adherence to the budget by all parties involved in the implementation process. This is strongly recommended to continue, if the activities lined up for completion during the no-cost extension phase are to be effectively catered for by this budget. The table below will give more information on the economy and efficiency assessment.

Table 1: Economy and financial Management Assessment

Description of Expenses	*LOA1*	*LOA2*	*LOA3*	*LOA4*	*Total LOAs*	*Total Expenditure*	*Variance*	*Variance %*	*Explanation*
Human Resources	**61,272**	**669,154**			**730,426**	**543,016**	**187,410**	26	-During recruitment, staff's salaries were lowly negotiated than had initially budgeted -Implementation was delayed due to insecurity
Travel (Local and International)	**4,320**	**7,560**			**11,880**	**3,550**	**8,330**	70	-As a result o the insecurity, travel to Somalia was limited in the part of the expatriate staff
Equipment and supplies	**13,200**	**130,800**			**144,000**	**135,600**	**8,400**	6	-No major maintenance cost accrued as most of the items are still new
Local office/Action costs	**5,640**	**62,040**			**67,680**	**77,000**	**-9,320**	-14	-Project budget had only provided for Merka field base but finally Qoreyooley was included
Other costs, services (consultancies, bank charges and visibility actions)	**4,320**	**49,920**			**54,240**	**12,000**	**42,240**	78	-Major cash transfer to Somalia (works) are made by FAO but charged from other sources
Other - Works									
Irrigation canal (primary) rehabilitation				32,728	**32,728**	**32,728**	**0**	0	-Cost of hiring the equipments used for the canal excavation as well as cost of construction materials have significantly gone up than budgeted
Barrage rehabilitation				4,408	**4,408**	**4,408**	**0**	0	
Agriculture activities/inputs			48,689		**48,689**	**48,689**	**0**	0	
Administrative costs (maximum 7% of 7, total direct eligible costs of the Action)									
Total eligible costs of the Action	**88752**	**919474**	**48689**	**37136**	**1,094,051**	**856,991**	**237,060**	22	

2.3.3 Reduction of the Project Overheads

Attempt to reduce project operational costs was noted in transport. Investing in purchase of project's vehicle(s), maintenance and other related costs, mainly fuel and the driver(s), usually takes up a major share of the budget that would otherwise be used for development activities. To minimize on the transportation cost, CEFA has resorted to hiring vehicles. For the field extension services, the project has bought four motor bikes which were noted to be in a very good condition. In regard to the terrain under which project activities are located, motor bikes are more efficient and appropriate means of transport. The overall impact of this action is reduction project cost and efficiency in implementation of the project activities.

2.3.4 Field Organization and Administrative Support

From the discussions held with field staff and the various committees (canal, market and contact farmers), a fairly well planned and all inclusive (local and Regional administration, village development committee and clan representatives) foundation has been established and was gradually taking root. It was evident that fairly well organized grass roots mobilization and awareness was created amongst the community within specific canal command area through undertaking of various PRAs. This explains the commitment noted by the members of the Bakoro and Fornari canals of managing and maintaining the irrigation system. It also explains the reasons why farmers took seriously their part of contribution which was essentially contribution in kind and their readiness to contribute and save money for O&M purposes.

> "CEFA works with the community on the ground and employs local people. The NGO involve us in their work, actually we are the one who officially opened Bakoro Canal for excavation work to start.
> *General Secretary, Lower Shabelle Region*

Production of key project out puts is a factor of the decision making process. The role played by the field office administrative unit of ensuring delivery of resources, follow up and speedy processing of the work certification for payment and relating the field operations with strong administrative backing, among other, generally enhanced the performance efficiency of the activities implementation. The field office was also satisfied with the speed at which decisions are made between the field office and the Nairobi CEFA office. However, they noted that, during the initial periods of the project, there were considerable time lapse in decisions that involve FAO and EC, which caused some delay in implementation. This was attributable to the partnership initiative which was a new concept to FAO and also to CEFA. The latter implemented SHARP project directly. These hitches have gradually been addressed and it was apparent that the partnership is working.

2.3.5 Training of Community Committee groups

Training of the committees (canal, WUA, village development and contact farmers' committees), are organized in situ within a central location. The trainings are designed to take two to three days starting from the morning and ending before 1.00 o'clock daily. This arrangement allows committee members to attend the training sessions with fewer constraints, particularly the distance covered, and give farmers ample time to attend to their routine cores.

From contextual point of view of the training modules that include managerial aspects of community groups and the technical component (O&M and improved farming practices and marketing); in the long run, the performance efficiency is envisaged. For instance, the community is expected to use the

acquired technical skills to ensure that the canal is always well maintained. This intervention will ensure an extended life span thus cutting cost of extensive rehabilitation. Also both, soft ware (conflict management, resource mobilization etc.) and hardware (maintenance implements and spare parts) aspects will be timely addressed as the skills and knowledge is owned by the community members.

In general, as can be observed in appendix 1 (d-1), Page 48, although there exists considerable variation in time planned for activity implementation and the reality, owing to the harsh condition within which the project is implemented, the progress made hitherto is commendable. This is largely attributed to the competence of the field crew in terms of effective organizational skills and collaboration between the technical team on the one hand and the community institutions on the other. The experience gained by the field team in implementing SHARP project as noted by CEFA staff, has provided the team with relevant experience which has been useful in the implementation of the project under review.

Although the project is progressing well and most likely it may accomplish rehabilitation work on time, including the no-cost extension period, the efficiency in transfer of skills and knowledge may not be satisfactorily achieved. A project of this magnitude calls for a period of follow up within which time for organizational and technical backstopping gap-filling strategy and support services are given to the participating communities. In addition, the process of integrating lessons learnt from each component of project cycle management with the aim of enhancing the overall process performance, may not be availed.

2.4 Effectiveness of the Project

2.4.1 Overview:

Being a mid of the term project evaluation, in terms of the project effectiveness, the extent at which the proposed milestones have been achieved and the implementation process were considered. The evaluation examined the associated benefits deriving from the project, the effectiveness and modalities of converting inputs into outputs, both planned and unforeseen.

The two year ARDOPIS project that commenced in July 2006 were to enable the farmers in the former banana growing areas to have access to and use irrigation infrastructure in a productive and appropriate way through:

- the rehabilitation of three canals (Bakoro, Fornari and Primo Secondario-the latter was replaced with Liban Canal),
- improving agricultural production by using irrigation and diversified cropping, and
- Strengthening relevant organizations and administrations to fulfil their functional roles.
- The project strategies and activities focus on rehabilitation of the selected canals and the related structures, enhancing the capacity of local communities to improve group managerial activities and operations and maintenance of the irrigation system. Diversification of crops with the aim of enhancing cultivation methods, skills transfer through training and the introduction of appropriate farming and sustainable marketing strategies have been envisaged. The goal, objectives, and the hitherto activities and the resultant outputs of the project under review have been assessed and are presented in appendix 1(outputs have been discussed with the project technical team).

As can be observed in appendix 1, it is clear that the project which is behind implementation schedule by over six (6) months primarily due to insecurity which characterize the operation are, have attained above average performance in producing the targeted outputs over the last one and half years. As

observed, the implementations of virtually all the activities have been started with a large proportion having been completed. Others are ongoing and due for completion in the three month's no-cost extension phase. In particular, the major activity of rehabilitating of the irrigation canals and the associated irrigation structures is on course. Two of the three earmarked canals have been successfully completed between late last year (2007) and early this year (2008). The remaining Liban and Bufow cross regulator have been surveyed and designed and their implementation should have started some few weeks after this review. However, during the presentation of the draft review report, it emerged that progress has temporarily been affected by the prevailing insecurity in the region. While using the project implementation information in appendix 1, the evaluation team estimates that the project has realized over 75 percent of the entire planned outputs and the expected impacts, particularly related to households food security and income, have gradually started to be felt by the farmers of Bakoro Canal command area who have already put about 75 percent of irrigable area under active crop production. These benefits are expected to be enjoyed soon by the farmers within Fornari canal.

While putting into account the speed at which Bakoro and Fornari canals have been implemented, the team is of the view that the remaining outputs are achievable within the non cost extension period if only security is maintained. All in all, a comprehensive assessment of effectiveness in terms of extent at which the objectives have been achieved and whether the targeted groups have been reached will be discerned during the project end of the term evaluation.

2.4.2 Effectiveness of the Project Strategies and Activities

This sub section focuses on the effectiveness and the results derived from the project strategies and activities implemented over the period under review, and as follow:

2.4.2.1 Effectiveness of rehabilitating canals and the related Structures

The entire earmarked length of Bakoro canal has been effectively been rehabilitated. Further structures that have been planned for rehabilitation including culverts, intakes, cross regulators and off-takes have all been rehabilitated and were functioning well by the time of this review.



Photo 1: Area under Bakoro Canal Command representing non-cultivation activities before the project interventions

As a result of this intervention, cultivation activities within the area under the command of Bakoro canal, which has been lying idle (no cultivation activities unless by riparian farmers of Shabelle River) for the past six to seven years (see photo 1 on how the area was let uncultivated before the rehabilitation), is now virtually under crop production. According to seventeen households interviewed, only one, representing about 6 percent of the entire population which has not resumed crop production. The probable reason could be the cost of inputs including ploughing which was reported to cost about $30 per hectare and other related costs. It was reported that poor households have to work in the large plantations to earn their livelihoods or partner up with well to do households to cultivate their land and eventually share out equally the produce.



Photo 2: Simsim farming in Bakoro Canal Command area.

Deriving from this insight, it was noted that as much as the rehabilitation of the canal has and will generally improve the livelihoods of the Bakoro farmer families, it however falls short of producing Pareto-efficient allocation of outcomes, for the farm families' progress[3].

As can be observed from the Table 2, below, with 15 households accounting for 88 percent of the total households interviewed, maize crop is the main crop grown although occupying on average 1.83 ha of land per household more land is dedicated to sesame as opposed to 1.3 ha for maize crop.

Besides the rehabilitation of the canals, the project is also constructing pans/ reservoirs from which livestock are watered. These structures are useful in that they discourage livestock from taking water straight from the canal which would otherwise result to its destruction. However, the closeness of the water reservoirs, which are build alongside the canal separated from each other by several metres of embankment does not effectively provide the required security as some of the livestock wander and ending up in the canal.

[3] D Mckevitt and A Lawton define a concept of progress, "as that change of activities and resources which moves society from Pareto suboptimal state to a Pareto optimal state". Pareto suboptimal state refer to when there still exist identified opportunity for change to improve all the participants of society for the better, while Pareto optimal state is when all the avenue for movement of activities and resources have been exploited.

Table 2: Crop Production and cropland Coverage

Crop Type	No. of HH	Area Cultivated	Average Yields
Maize	15	1.30	21 bags
Simsim	12	1.83	0
Beans	3	0.67	10
Onions	3	0.67	0
Tomatoes	5	0.75	4,737 kgs
Tobacco	1	0.50	5 bags
Costo	3	0.50	8 bags
Carrots	1	0.25	2 cartoons

2.4.2.2 Effectiveness of Community Training

The farmers training module is broad and comprehensive touching on both the organizational development aspects (OD) and institutional strengthening (IS) aimed at strengthening the managerial aspects of farmers' groups. Further, the training module is detailed on the agronomic aspects, O&M of the irrigation systems and marketing component.

From the contextual perspective of the module, the training whose objectives are to impact knowledge, skills and, attitudinal change and practices, and establish networks between farmers and other key stakeholders, is appropriate and effective. So far 21 committee group members (canal, WUA, village development and contact farmers' committees) from four villages of the Bakoro canal have been trained in 2 to 5 consecutive days mainly starting from morning until noon. According to progress reports coupled with confirmation from the training team, the intended outcomes of the training have been successfully been achieved. Further, the evaluation team is of the opinion that once demonstration plots are fully in operation, more effects in terms of technologies transfer and adoption will be achieved to larger number of farmers benefiting as compared to the training which is currently confined within contact farmers and canal committees.

Another effects arising from training is the aspect of enhanced community mobilization and organizational capacity which is directly associated with capacity building as farmers are being organized to manage and maintain the irrigation system.

The overall expected impact of the training includes:

- Improved use and productivity of the water resources,
- Diversification of crop types and varieties (as can be observed in the table above),
- Efficient use of land resources, and
- Market connectivity and linkages
- Improved farmer organization and governance
- Improved food security and livelihoods

It is worth noting that some of these skills and knowledge mentioned are gradually being impacted and they largely remain as intended in the shorter term basis. Further, the effectiveness of these outputs needs to be further analyzed in terms of results or outcomes positively affecting the committees' performance in attainment of the groups' cohesiveness and in the operation and maintenance of the irrigation systems. In particular, the time taken in the training sessions appears insufficient to adequately cover the ODIS and the specific modules (marketing, O&M etc). This needs to given due consideration to ensure the intended project benefits are achieved. **It is recommended**

the project extension period be increased from current three months to six months to provide sufficient time for skills transfer, testing and application of the same.

A key training requirement that is lacking is the community based natural resource management (CBNRM). CBNRM is a transfer of the rights over natural resource management to lower levels of decision -making institutions. It centres on devolution of power from central government and empowerment of communities (user groups). This particular module appears relevant and appropriate for Somalia case which has been without a central government since 1991. A quick look into farms in the project area gives a picture of farming system and general land use that does not consider agroforestry intervention. Yet besides the farmers relying on the renewable energy sourced from fire wood, which it is clear is quickly depleting the scarce forestry cover, the farms have no tree cover apart from those households growing bananas and fruit trees.

2.4.2.3 Effectiveness in Crop Diversification and Marketing

Farmers interviewed reported to have been traditionally growing maize and beans after banana farming was rendered impossible after siltation of the canals. However, from FAO and CEFA intervention, new crops have been introduced (see table 3 above). This intervention, coupled with that on improved farming practice, is likely to result in increased crop production for household food and improved livelihoods.

2.4.3 Effectiveness of Organization and Institutional Coordination

In Weber's view (1947), everything about an organization should aid in the pursuit of its goals and objectives so that it is a mechanism for their rational, efficient accomplishment. A major factor that may dictate the kind of organization model and the *modus operadi* to be adhered to is the environment within which operations takes place. "Due to the difficulty security and political conditions that prevailed and still characterize in South Somalia which also forced the top management to monitor the project from Nairobi"[4] an organization arrangement seem to have been reached which vested the field team with considerable degree of autonomy of leading the operations. Despite this devolution, the interaction between Merka base and Nairobi remain active and well coordinated as reported by the field team.

In particular, the field team was noted to work extremely very well with meaningful interactions between the technical team and the administration. Both the technical and administrative teams have also created an interactive and meaningful participation with the beneficiaries. The evaluation team attributed the realization of the project outputs within considerably short time of implementation to the effectiveness of the organizational arrangement on the one hand and the capacity of the field team in mobilizing the community members. Increased participation, management and coordination of the rehabilitation activities, among others will engender commitment and ownership of the project by the beneficiaries.

Other effects associated with the implementation of the project include:

- Providing security against drought
- Allow year round cropping
- Promoting development in areas where rain fed potential is poor
- The operations of the gates will result in more water in the canals for irrigation and hence more food crops and improved income that will result to improved living standards of the communities.
- Movement across the river will be safer and easier once the bridge decks are repaired.

[4] Monitoring Report, Somalia-SO-Title. Monitoring Reference-Date: 15/12/2007.

- It will assist in flood control especially for minor floods. Damages inflicted by floods include; damages to crops, infrastructure and properties in the flood plain.
- Flushing of silt deposit will increase the river water velocity and reduce the chances of disease vectors such as snails surviving in these waters.
- Movement of river fauna such as fish and crocodiles up and down the river will become easier after rehabilitation/construction of fish ladders.
- Improved operation of control gates will lessen any conflicts between various water users especially during low flow season.
- Project was to targets primarily group-based irrigation schemes where farmers are in charge of operation and maintenance.

However, information gathered from the field indicates that during the early stages of implementation, some delay in decision making between CEFA Nairobi office and FAO are to blame for inefficient implementation of some of the project activities. These hitches have been and are being effectively addressed and fairly smooth organizational flow of information and decisions has been developed. Perhaps this was to do with the gestation period of partnership that was necessary for effective bonding of the FAO and CEFA.

On institutional interactions and activity coordination, it is apparent that no major commitment has been devoted. Some forms of collaborations were, however, noted at project level: PACSU for construction clearance on behalf of EC and FAO for CEFA; SWALIM, a FAO implemented EC funded for source of information. Collaboration between INGOs working in the irrigation sector within the project area, like Concern and CARE is minimal if any.

However, CEFA has developed useful working relationship with the district and regional administration of Lower Shabelle, as confirmed by the Police Commissioner and the General Secretary of the Lower Shabelle, who asserted that they are ready to provide maximum security to CEFA staff for their good work to progress well.

2.4.4 Gender and Environmental Issues

Attempts to mainstream gender in the operations of FAO and CEFA have been noticed. In its training manual, one of the topics of the training material is directed on defining gender roles in irrigation development. However, this is not so in practice, perhaps due to the non-productive roles of women as perceived by Somali community. Yet women are more involved in productive activities such as crop and livestock production, which are the mainstay of the community.

In many of the community committees visited, the evaluation team found out that only one female member was included and in most instances, it was virtually male dominated. With the sensitization and awareness creation activities conducted by the project, gender imbalances may gradually change. For instance, in a training session that the evaluation team found in session, of the thirty contact farmers drawn from canal and contact farmers committee of the Jerrow village of Bakoro canal command area, seven were women and a considerable number of the participants were youthful. The fact that Simsim contact farmers, which has brought together 190 farmers for production of the crop for market is chaired by Mrs Fatuma Omari Yusuf who is also the vice chairperson of Buko village canal committee, is an indicator of a positive development that perhaps is likely to come with increased training and support to women farmers.

On environmental issues, there is need to integrate catchment protection and river management issues in the project. Additionally, CBNRM concept needs to be harmonized with the development of the irrigation activities. Although there are indications of integrating tree planting activities, its effect

and uptake by the farmers as an appropriate farming system is in doubt owing to the short implementation period remaining.

2.4.5 Visibility of EC

At the ground level where implementation is taking place, a strong bondage has been created between CEFA and the beneficiaries. But it was difficult for them to lift the veil to see the linkages between CEFA and EC. However, at administration level, the officials are aware that the activities implemented by CEFA have been financially supported by EC. This piece of information has been given to them by CEFA. More so, such information is not contained in the billboards erected by CEFA at the activity area.

2.5 Impact of the Project

2.5.1 Overview

According to this evaluation, project impacts have been viewed as the assessment of the systematic analysis of the changes in farmers' lives as a consequence of the interventions implemented. Short and long term impacts, as well as direct and indirect impacts have been considered in the assessment. Further the dimensions of the impacts, either positive or negative have been accounted. It is worth noting that, due to the level of implementation phase of the interventions, in most cases it was difficult to collect quantitative data, thus qualitative assessment and use of non-quantifiable parameters including deductions and inferences based on discussions held with farmers and other key stakeholders interviewed, were applied to determine real and perceived impacts.

2.5.2 Desirable Impacts

2.5.2.1 Impact from Canal Rehabilitation and Diversification of Crops

With the rehabilitation of the Bakoro Canal, the land that has been lying idle after the canal failed to operate some six to seven years ago, has been cultivated since the close of 2007 when the rehabilitation work was completed. Some of the farmers, as can be observed in the Table 3, below, have started harvesting. Majority will have their crop harvested before the onset of the *Gu* season. From the crop production activity, household food security will improve as well as incomes. From Table 3, it is observable that the farmers' strategy is both to achieve food sufficiency as well as growing for market. The former, appear more significant with many more farmers involved in cereal production as compared to horticultural farming which is essentially for commercial purpose. The fact that of the 21 bags of maize harvested on average, only 3 bags were sold as opposed to 17 bags that were stored, denoting about 14.3 percent, supports this notion. Predominantly the tomato crop harvested (90%), was destined for market.

To promote farmers' incomes, the project carried out market survey from which a trading partner, Al-mizan regional company, has entered into a contract with 190 (60 women and 130 men) farmers of Bakoro canal. The company has provided the farmers with Simsim seeds whereas the farmers have, individually set aside between one to five hectares of land totalling to 500 ha of the crop which is about a month to harvesting time. CEFA is still exploring other markets, including international ones (Italy, Iran etc). It should be noted that issues of marketing are broad, fragile and time consuming if proper coordination and information sharing mechanism has to be developed and operationalized

Canal rehabilitation has improved access to domestic and livestock water supply and encouraged resettlement, for instance more than 500 households that had deserted the area due to water constraints have resettled in Jerrow village. Buro-Marerta village which is at the tail of the Bukoro canal lies about 16 km from the river. This is the distance the farmers residing here had to walk as compared to barely 300 metres that is covered by the farmers settled at the furthest corner of the village. Figure 2 (Appendix 4, Page 67) shows Bakoro and Fornari Canals.

Table 3: Impact of crop production on Farmers

Crop Type	No. of HH	Yield[5]	No.of HHs	Amount Consumed	Amount Store	No. of HHs	Sold	Market	Price
Maize	15	21	3	1.5	17	1	3		5,850,000
Simsim	12	0	0	0	0	0	0	0	0
Beans	3	10	1		10	0	0	0	0
Onions	3	0	0	0	0	0	0	0	0
Tomatoes	5	4737	0	35.5	0	3	4690		4,435,000
Tobacco	1	5	1		5	0	0	0	0
Costo	3	8	2	0.5	0	2	15		22,500,000
Carrots	1	2	1	2	0	0	0	0	0

Good working relationship with the administrative organs have created a conducive environment within which the social change as spear headed by FAO and CEFA, can grow and multiply overtime time. Involvement of the administration is expected to considerably improve coordination and management of the irrigation as the community governing organs have alternative redress fora for management issues that go beyond their capacity.

> *"CEFA has excavated canals and are still working on others. Before, we had no love for land, but after excavation, people are back to plough the land"* **Ali Adan Ali Omer, Police Commissioner, Lower Shabelle Region**

2.5.2.2 Anticipated Impact from Community Mobilization and Capacity Building

The skills and knowledge the farming community will acquire from the project will enable them to run farming as a business for improved production while ensuring the integrity of the resource base (water and soils). It is assumed that the community will acquire capacity to manage and run common property resources through inbuilt mechanisms of resolving conflicts through improved allocation and distribution of these resources, especially water.

The training in O&M will ensure that the benefits from the irrigation system are improved and sustained as much of the technical skills are transferred by the managing committee to farmers. In addition, the act of improved community mobilization and organization will increasingly trigger the process of social capital building which eventually has the potential of creating a more consolidated and stable farmers' society in the long run breaking clannism and ethnicity cord.

[5] Maize and beans yields are given in bags, tomatoes are in kgs after conversion from drums of 70 kgs while carrots and costs are in jibal (cartons) of 25m^2

2.5.3 Negative Impacts

Negative impacts include existing and possible ones are as described below:

- **Risks of drowning**:-During fieldwork, the evaluation team encountered young boys swimming in the canal. If care is not taken, incidences of drowning might occur; See Photo 3, below.

- **Gender Insensitivity**:-While bringing the water resources closer to the people hereby considerably cutting the distance for water and mitigating against the drudgery for search of water, particularly for women whose responsibility for securing household water rests on their shoulders, there is no well-built designated points for water fetching. A woman drawing water on the sides of the canals which are usually treacherously slippery fell into the canals.



Photo 3: The canal is also used as a source of domestic water. The woman in the canal had accidentally fallen into the canal

- **Vector breeding grounds: -** whereas the canal water is flowing pretty fast thereby minimizing the possibilities for mosquitoes to breed, water reservoirs from which livestock drink water has no outlet. Some of them are built close to the resident areas. These could eventually become fertile grounds for mosquito and other vectors breeding consequently raising incidences of malaria and other waterborne diseases.

- **Environmental Impacts**:-Increased population within canal command areas will result in negative environmental impacts. Some of these may include, degradation of water quality and quantity; degradation of the land resources and increased application of agro chemicals in attempt to increase commercial production.

- **Further increase of income of households**:-The fact that some households are poor to manage their farms despite the access to irrigation water and land, the better off households will continue to exploit them through payment of peanut daily wages and hiring out of their farms. The little earnings they earn is not sufficient to enable them move from the poverty web but the well do to farmers' livelihood will continue taking the upward growth mobility. Issues of poverty are likely to increase conflict and segregation within the farming community.

- The introduction of irrigation water into a previously arid environment has the potential to dramatically alter soil and water conditions. Some of these impacts are the direct result of changes in water flow, others are the results of the interaction between water and soil habitat. Other impacts are:
    - ✓ Removal of irrigation water on downstream ecological systems
    - ✓ Return water from the project on the natural systems
    - ✓ Salinity is likely to be a problem in the long run



Photo 4: Note the number of charcoal bags. Charcoal burning in the project area is intensive

- ✓ After rehabilitation of the barrages it is anticipated that more water will be diverted to the canals due to the efficiency of barrage operations. This will affect the river Flora and Fauna downstream of the barrages resulting in loss of biodiversity especially during low flow season. It can also cause conflict with downstream users. The impact is considered to be high and negative.

2.6 Replication potential of project positive results

Potential for replicating the project positive results are very high. One of the strengths of FAO and CEFA is documentation of implementation activities. Lessons learnt and experiences are recorded in their biannual progress report.

Secondly, the field team is appropriately equipped with knowledge and skills of the project activities including engineering, agronomic and capacity building aspects. It should be noted that some of the staff had been involved in the SHARP project. The evaluation team noted a considerable reference in terms of community mobilization and technology interventions.

Further, the community structures being strengthened by CEFA will also provide rich ground for project replication. CEFA is revamping relevant capacities to the canal committees, contact farmers, Simsim group as well as that of local leaders. A strong working relationship between grassroots community structures being strengthened by CEFA and the administration have the potential of positively impacting on the governance and appropriation of common resources, including water. Some of the motivation driving such community structures includes improved crop production, food security and household income. Strong community structures will immensely contribute to the project sustainability as well.

Table 4 depicts a SWOT of the community based governance structures being strengthened by CEFA. Such structures are significance and should be considered for replication.

Table 4: A SWOT of Community Based Governance structures of ARDOPIS Project

Community Structure	Their Roles and Functions	Motivation: why do they do it?	Strength	Weakness	Remarks
Canal Committees	-Water Allocation -Ensuring equity in access to irrigation water -O&M	-To restore farming activities in the canals command area -To achieve food security -Source of household's income	-Have been trained by CEFA (Managerial- conflict management, O&M, leadership dynamics, financial management etc; technological: O&M,), -Were elected by the community -Have by-laws -Represent all the 16 villages -Relate well with the administration	-Illiteracy -Clan based, possible area of conflict	-Demonstration plots will provide practical learning -Committee are accepted by the community and the administration
Contact Farmers	-They implement the taught technologies -They help the extension officers in contacting other farmers	-Promotion of crop production -Enhance crop yields	-They were selected by the community with the help of the extension officers -Represent a working unit -Relate well with the other farmers -They are innovative	-Illiterate -Clan based	Willingness to learn and adopt new farming skills -Demonstration plots will provide practical learning
Simsim Group	-Are cultivating simsim for export market -Adopting farming technologies trained	-Income generation	-Financially stable -Well conversant with farming activities -Have sufficient land which can accommodate different enterprises -Are former banana exporters	-Outdated skills in farming practices -No access to marketing place for their produce	-Willingness to learn and adopt new farming skills -accepted by the administration -Capable to produce quality farm produce
Local Leadership	-Maintain peace and order -They link the community with the government -Settle social disputes	-Need for peace and prosperity -	-They are elected and respected members of the community -They come from the dominating clans of the respective villages -They relate with the ruling group, religious leaders and factional leaders in the area	-They are armed -The TFG soldiers don't mostly respect the local leaders	-They are very helpful to the NGO workers -They follow traditional norms and rules

2.7 Sustainability of the Project

Sustainability here looks at whether the positive outcomes of the project are likely to continue after external funding ends, and also whether longer term impact on the wider development process can be sustained by the target group members.

The point of departure towards building of sustainability strategies is the strengthening of the community governance structures and technical training on O&M of the irrigation system thereby empowering them to repair and maintain the infrastructure internally. Strong management committee not withstanding, the importance of having effective administration was underlined as one of the challenges associated with the management of common property use. The challenge is how to deal with free riders or utility maximizing members who frequently float the by-laws. Strong administrations are better placed to deal with such members of the society whose behaviour might be beyond the capacity of the committees. According to the observation made by one of the farmer's respondent, lack of strong administration was the reason behind the breakdown of the irrigation infrastructure in the area once the central government collapsed. According to the respondent, the TFG has strengthened the central administration and has been helping the community to solve some of the conflicts that local structures are incapable of handling.

In addition, although, no empirical data as some of the vital significant impacts of the projects are yet to come by, the expected income deriving from the food diversification and the fact that farmers have been trained on financial mobilization, savings for irrigation system maintenance should be possible. Indeed, farmers strongly confirmed that they are out to ensure that money for maintenance is contributed by members promptly and that they would not allow the system to breakdown again. It is the opinion of the evaluation team that the project has largely succeeded in establishing community participation and ownership through PRAs and if the commitment shown by the committee and farmers of Bakoro canal is something to go by, once the canals are rehabilitated, the community will take charge owing to the foreseen benefits. The suffering they have gone through when the system was out of order will be a major impetus to keep it running.

General security in the area no doubt will play a major role in ensuring maintenance of the developments achieved so far as well as social infrastructure being revamped through training.

3.0 KEY LESSONS LEARNT

Lesson learning is an important component of effective project management and implementation. Lessons learnt should be an integral part in all the stages of project cycle management. A lesson is a new idea, process, experience or understanding, which goes to improve the way the project is managed and contributes to greater effectiveness and wider impact of the of an activity. Usually interventions do not turn out exactly the way they were planned; sometimes the needs are not immediately clear or cannot be easily understood; circumstances also do change, for instance there may be new people in the community, for our case, the IDPs who have settled in the project area running from conflict in Mogadishu, there may be new needs, old needs may have been addressed or problems might be affecting people differently. In this light, it is needless to state that project must make a conscious and deliberate effort to tease out lessons, document them and incorporate them into the project cycle as well as share them with partners and other stakeholders in order to contribute to best practice and enhance final products. Lessons learnt are more critical for the case of mid term evaluation as it focuses more on the implementation process in view of improving its performance. This section of the report summarizes some of the lessons learnt from FAO and CEFA's project implementation hitherto. It is grouped into Relevance, efficiency, effectiveness, impacts and sustainability of the interventions.

3.1 Relevance of the Project

- The breakdown of the irrigation system in the project area denied former banana growers a significantly important source of income. Rehabilitation of the canals by FAO and CEFA is gradually restoring livelihoods. The benefits associated with this activity have created an important impetus in community to ensure the canals are maintained. Farmers reported their readiness to save (and to be saving) some of the money earned from the sale of crop yields purposely to build irrigation system maintenance kitty.
- Rehabilitation of the canals, interventions in crop diversification and marketing, is an appropriate strategic approach of contributing towards accomplishment of the overall project objective in that farmers will access irrigation water and improved planting material both for food and market oriented.
- Linking farmers directly to the market and building their capacity to manage and coordinate farmers' groups will discourage exploitation by middlemen resulting in increased income. However, the evaluation team was of the opinion that the search for international markets by the project is rather far-fetched and unrealistic.
- The project strategy of combining productive activities with training is sound. The project component on crop diversification, O&M and managerial aspects, is expected to be very useful in supporting increased crop production, maintenance of the irrigation system and building capacity in community in management of utilization of collective resources.
- This mid of the term review confirms that the project as implemented will continue to remain the core of any development in Lower Shabelle. Much of the irrigated area is group-based, and gravity fed, which contributes substantially to subsistence as well as commercial farming
- Soil salinity in the area is a problem and more water would likely escalate the problem due to the rise in the water table and water logging.
- To establish and run an irrigation project effectively a number of activities are required such as administration, technical operation, maintenance and governance. The farming communities require skills to undertake these activities effectively. If there are insufficient skills in any particular area it can have disastrous effects on the entire project.

3.2 Efficiency of the Project

- Strengthening of the existing community governing structures, other than creating absolutely new structures, will pose a lesser challenge of popularising it amongst the community and other stakeholders, especially the administration. Transaction costs will be low as stakeholders understand roles and responsibilities of traditional structures upon which project management committee are drawn.
- Lined canals will increase the efficiency of water flow and eliminate wastes, but the cost is extremely high.
- Capacity building in improved farming practices and in particular, on plant water requirement will result in a productive way of water utilization and increased crop productivity
- Empowering the community governing structures through formulation of by-laws will promote collective conformance and efficient management and maintenance of the irrigation system. Effective local governance is a panacea to reduced conflict and increased productivity
- Gravity flow irrigation technology through the use of canals is economically efficient, more environmentally appropriate and technologically easier to operate than the pumping technology that well to do people have resorted to.
- Demonstration plots are ideal and should be promoted further as the main training centres. Besides the importance of the multiplier effect- that more farmers will be reached as compared to the training of the contact farmers, the impact of practical training is more appropriate to farmers who are predominantly illiterate. Farmers field schools are more effective in this scenario of farming
- The performance of an irrigation scheme typically focuses on the “efficiency” of water use. This means the volume of water required by the crop divided by the volume supplied at any given level in the system. Other important performance indicators are:
    - Adequacy
    - Dependability
    - Equity

3.3 Effectiveness of the Project

- The distance walked for domestic and livestock water has considerably been reduced. Buro-Marerta village which is at the tail of the canal is about 16 km from the river. This is the distance the farmers residing here had to walk as compared to barely 300 metres that is covered by the farmers settled at the furthest corner of the village.
- Through gravity flow of water through the canals, many more people are served.
- The community is getting more organized as a result of the training received as well as the newly found motivation of ensuring proper utilization of the water resources.
- The state of access roads from the production area to the market will be critical in determining the success of commercial production.
- Without intervention in diversification and improvement of planting materials, access to water alone will not effectively improve the crop production as the traditional maize and beans seeds coupled with poor farming practice, only about a quarter of the area production potential will be achieved.
- Although the project overall objective development objective cannot be realized within the project lifespan, positive results have already started to trickle down. In Bukoro canal, farmers have started to cultivate their land which has been lying idle for the past six to seven years after the canal broke down. Harvesting is due before the start of the rains in April. Such encouraging results are also expected in Fornari canal in the month.

- The needs and interests of women should be considered at the earliest stages of the project design so that effective strategies for their integration are put in early enough.

3.4 Project Impacts

3.4.1 Positive Changes Deriving from the Project Interventions

- Increased crop production will result to improved health and income of the farmers' families. Currently only a very small, proportion of farmers who have made some harvest. For instance, only 3 farmers, representing about 18 percent of the Bakoro canal farmers who have harvested.
- Improved farmers' organization will result into increased social capital building and positively impact on consolidation of the community.
- Improved access to water resources for irrigation, domestic and livestock consumption will encourage settlement growth in the canal command areas. Increased population is likely to impact negatively to environmental integrity including the resource base if no intervention towards protection of the environment is undertaken.

3.4.2 Challenges Related to Project Impacts

- It is difficult to achieve adequate and equitable supply across the project without close control, flow measurement and proper scheduling. This aggravated by the undetermined water losses through the unlined canal. The main canal draws a lot of sediment from the unregulated river. This will lead to high maintenance needs within the network.
- During the visit at the intake site, an assessment of river morphology indicates that changes in river alignment can be expected. The study reviewed that there has been no provision for regular reporting and no standards have been established. There has been no pressure to regularly use data at the regional level in order to maintain the systems. Regular meetings between CEFA and farmers to check on progress was not incorporated in the scheme deign.
- The project has been in operation (actually rehabilitation phase) for about one and half years, hence the environmental impacts are still not well developed. However the consultants noted that area surrounding the scheme shows signs of soil erosion. Almost the generally free draining soils showed little evidence of damage from irrigation.

3.5 Sustainability of the Desired Project Outcomes

- Empowerment of the community in O&M will ensure that the capacity for basic maintenance and repair of the irrigation system is owned and retained in them even after the project comes to an end.
- Farmers showed a strong commitment to initiate project maintenance fund from the sale of farm produce.
- Projects like ARDOPIS addressing reduction of poverty amongst vulnerable communities like the Lower Shabelle farmers should provide sufficient human and other resources, spread over a realistic time to give the target group time to adopt the technological intervention and effective implementation of the project activities.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusions

a) Insecurity interrupted the commencement of the project and delayed it for a period of three and a half months. Even after, the project finally got underway in July 2007, the progress has through out the implementing period, been occasionally marred by infighting. As per this review, the project is more than six months behind schedule. Nonetheless, the project has made a big stride in accomplishing the set out outputs. Although these outputs were difficult to concisely assess the percentage achieved hitherto, the evaluation team estimates the project to have achieved more than 75 percent of the targets set. Although, the project is on course and with its request for three months no-cost extension accepted; it is unlikely to realize all virtually the targets. *It is envisaged that project is on course and is not necessary to revise the logframe.*

b) Success of the community institutions will to a great degree depend on the performance and capacity of the administration to manage conflict arising from common utilization of resources that the community may not resolve by their own.

c) During the design review, relatively low scheme efficiency was used. No details were given for selecting low efficiency. But in a situation where water management can be improved, then there will be a need to increase the efficiency, thereby reducing the gross water need. As well if the effective rain was to be taken into account, either from previous government records or any field records the gross water need would likewise reduce.

d) Intake design should be reconsidered, since there is no provision for exclusion/extraction of sediment at the intake. Off-take structures are gated. It is clear that the farmer's knowledge and skills in managing the system is not good enough. Simpler proportional structures requiring less control should be investigated and installed or technical advice on how to distribute the water equitably should be provided.

e) Equity does not appear to be a problem and there is no head/tail conflict. Farmers participated in the initial planning and during rehabilitation, hence commitment to, understanding and appreciation of the works is good. Poor supply and costs of in puts is a major issue. Farmers show interest in management and the perceived benefits associated with the rehabilitated canals, and there is motivation from farmers to take upon themselves the responsibilities of O&M.

f) Assessment of the hydraulic performance of the rehabilitated canal should have been carried. This should include short and long term collection of flow records at strategic locations based on the existing structures throughout the command area. This enables the determination of water supplied to various sections of the scheme to be compared with the crop water requirement. This is a performance indicator, the adequacy, i.e. the degree to which water requirements were met and efficiency, the degree to which the farmers were able to manage the water and to determine water losses. By comparing the supply of water to the different locations the equity of supply can be determined. Similarly, by comparing the amounts of water supplied over time, the dependability of supply can be calculated.

g) Agricultural growth should occur through improved technology and productivity. It should be supported by an enabling macro-economic environment and investment in infrastructure and human capital, and attention be given to gender and environmental issues.

h) A detailed calculation of the gross water is need based on established cropping pattern should be undertaken during farmer training in appropriate water management. At such time specific field data should be collected to allow for an area based gross water need determination

i) To undertake international market survey for farm production based on cropping patterns and harmonization is a far-fetched and unrealistic output that should be reviewed or discarded altogether.

4.2 Recommendations

a) Although the project outputs were difficult to concisely assess the percentage achieved hitherto, the evaluation team estimates the project to have achieved more than 75 percent of the targets set. Although, the project is on course and with its request for three months no-cost extension accepted; it is unlikely to realize all virtually the targets. It is envisaged that project is on course and is not necessary to revise the logframe. However, it recommended the project be extended for six months to allow sufficient time for skill transfer, including including NRM messages in the extension package.

b) Poor road infrastructure will limit the farmer's income in several ways:
   i. Poor access roads cause wear and tear of vehicles and invariably increase transport costs
   ii. Crop choice may be restricted by the cost or limited availability of inputs
   iii. The value of perishable crops may be reduced in transit

   Framers in the project area have pleaded with the project to consider upgrading the access road linking Bakoro Canal command area to the main road connecting Kismayu and Mogadishu to facilitate transportation of farm produce particularly during the wet seasons. This access road is about 14.4 km. While considering this concern has been expressed by the community during initial PRA exercise, CEFA and FAO should include upgrading of the access roads within the no cost extension period. Alternatively, CEFA and FAO could identify other organizations dealing with rural access road upgrading and link them up with the canal committees for future partnership.

c) Environmental conservation through pre-investment in environmental impact assessment and follow-up plans for all newly constructed projects should be instituted and environmental awareness creation component needs to be integrated in the remaining project implementation phase. In addition, deliberate effort to support the communities in lobbying and advocating for river catchment protection should be initiated.

d) There is the need for the project to initiate an information sharing mechanism linking farmers with key stakeholders including potential traders/ consumers of the farm produce. Information sharing on markets and other aspects geared towards improving crop production and marketing will be a major driving forces behind development of irrigated agriculture thus realization of the project overall objective in the long run. Secondly, the project should initiate and assist farmers to develop partnerships and collaboration (net-working) building with key stakeholders. This will contribute towards ensuring sustainability of the project even after the project completion. These two aspects are essential strategic plans for planning exit strategy within the project life span. Before exit strategy is implemented usually at the end of the project implementation, a phase-down process is essential and mainly is informed by the outcome of the mid of the term evaluation, particularly in as far as community structures and activities have attained sustainability levels. This should be done systematically where technical and organizational backstopping is envisaged until such a time when the community systems are self sustaining. Phase-out on the other hand is complete withdrawal of FAO and CEFA

activities. It is important that the phase out is worked out carefully and in stages to minimize the impacts associated with partnership parting in order to ensure sustainability of the committees and their projects. This is mainly informed by end of the term evaluation.

e) Monitoring and evaluation: These are important elements in PCM. The aims of both monitoring and evaluation are to improve the overall management of projects and to enhance their performance by providing information and feedback on the implementation and the performance of the projects to all parties. CEFA should develop a monitoring and evaluation plan before the closing of the project and have time to try it out together with the beneficiaries to ascertain its effectiveness. .

f) Commercial farming which is inevitable with the rehabilitated canal system is expected to motivate farmers to enhance crop productivity through application of inorganic fertilizers. Farmers should be trained on the safe use of pesticides and other chemicals to avoid poisoning. The use of fertilizers should be done in the appropriate manner to avoid excessive use because it might find its way to water bodies causing eutrophication.

g) It is recommended that the project should immediately commence on manual flow measurements utilizing wherever possible existing structures. The times at which off-take gates are opened and shut should also be recorded. In future, ultra-sonic water levels should be installed at various points, to check on the accuracy of the manual readings. The project staff should routine scheme visits, to undertake rapid appraisal to provide further information about operation and maintenance. In this way estimates of conveyance and application efficiencies could be established.

h) Given that the performance of the project has to a great extent been successful in terms of achieving the project objectives, and that they can be sustainable in the long term, it is recommended that the project be replicated in the region. However the existing constraints in the current project implementation structure calls for its review with a view to establishing a more technical, efficient and responsive institutional arrangements for managing the project. A major emphasis being laid on use of appropriate and low cost/affordable technologies. Other aspects include sustainable management of environmental resources and promotion of gender equity.

i) Drainage is a challenge and FAO is requested to provide funds to undertake a detailed study and investigate a more efficient irrigation system.

j) The canals are not lined and as such the project must be losing a lot of water from seepage. Engineering soil tests should be carried out immediately to determine allowable seepage losses and the effect of the same on groundwater. This is in addition to the promotion and training of effective water management groups

k) Effective management of potential negative environmental impacts arising from a development project of any kind cannot take place in the absence of adequate baseline information about the environment within and beyond the project area. Whilst it is not expected that the project itself should be responsible for baseline data collection, it is considered vital that the project provide incentive for outside agencies to participate.

LIST OF APPENDICES

Appendix 1: Terms of Reference

Appendix 2: Firm and Consultants Profiles

Appendix 3: Methodology Applied

Appendix 4: Logical Framework (Original and Updated)

Appendix5: Maps of the Project Intervention Area

Appendix 6: List of Documents Consulted (References)

Appendix 7: List of Persons and Institutions Met During the Mission

APPENDIX 1: TERMS OF REFERENCE

Agricultural Rehabilitation and Diversification of High Potential Irrigation Schemes (ARDOPIS): OSRO/SOM/510/EC and OSRO/SOM/511/EC

Contract Proposal for Project Evaluation

Terms of Reference

1- **Evaluation of Project OSRO/SOM/510/EC in Middle Shabelle (Balad District) Lower Shabelle, (Agfoye and Awdegle districts) and Lower Juba (Jamama district).**
2- **Evaluation of Project OSRO/SOM/511/EC in Lower Shabelle (Merka and Qoryooley districts).**

Country: **Somalia**
Contract Authority: **INTERNATIONAL ORGANIZATION (IO)**

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1. Background

IO, Agrosphere and CEFA have been collaborating with EC Somalia Unit individually for more than 10 years in agricultural development of Southern Somalia. A series of actions funded by EC Somalia have resulted in data gathered and kept under SWALIM, bulletins on food security situation in Somalia produced by FSAU, rehabilitation of agricultural infrastructure including irrigation canals, river embankment and farmers training in appropriate crop production by both Agrosphere and CEFA.

In 2006, IO, CEFA and AGROSPHERE responded jointly to a call for proposals by the European Commission, and subsequently won the contracts for implementation of the ARDOPIS projects (OSRO/SOM/510/EC and OSRO/SOM/511/EC) aimed at rehabilitation of irrigation schemes. IO will implement this action together with Agrosphere (Lower Shabelle, Middle and Lower Juba) and CEFA (Merka and Qoryooley Districts).

The main objective of the ARDOPIS project is that household income of rural families is increased through improved agricultural production.

The action purpose is that farmers in the former banana growing regions have access to and use irrigation infrastructure in a productive and appropriate way.

At result level ARDOPIS is expected to achieve the following:

In the action implemented by CEFA:

1. 4 sub-command irrigation systems in Merka and Qoreyooley districts with a total control area of 23,170 ha rehabilitated during the project period;
2. At least 3,000 farm families have improved agricultural production through use of irrigation and diversified crops during the project period;

3. At least 3,000 farm families practice improved soil and water use and management during the project period;
4. At least 1,000 farm families practice market-oriented farming for 2 seasons targeting local and export markets during the project period.
5. At least 5,000 farm families receive services through strengthened relevant organization and administration.

For the action implemented by Agrosphere:

1. At least 150 km of small primary canals and 30 km of secondary canals are rehabilitated;
2. 8,000 ha of flood fed irrigated area developed;
3. At least 60% of the farmer population in the target area have access to adequate irrigation water and utilize this water appropriately, cropping plans and patterns.
4. At least 3,000 farmers will be trained in improved agricultural practices including adapted irrigation techniques, through contract with farmer trainers and relevant farmers' organizations.
5. At least 5,500 farm families receive services from strengthened water users association and village development organization.

2. Contract objectives

A local Consultancy Firm will be contracted by IO (Contracting Authority) in order to carry out separate evaluations of the two projects. The main aim is to obtain an objective and independent analysis of the progress of each project in terms of relevance, efficiency, effectiveness towards the expected impact and sustainability. A substantiated assessment should be made on the progress, achievements of objectives and results with reference to the project proposal and log frame as well as the implementation methodologies and the projects internal procedures. The evaluations will also identify and document lessons learnt and make recommendations that the Project partners and stakeholders may use to improve the ongoing implementation. One contract is being provided to cover both evaluations in view of the common partnership with IO and expectations of additional information to be gained from comparison between the two projects.

The Consultancy Firms responding to the tender will be evaluated on the content of their proposal, their experience with evaluations, knowledge of the Somalia context and the quality of the individual candidates proposed. The company selected will be entirely responsible for the recruitment of the staff/consultants, their travel and the content of the final report.

The Consultancy Firm should indicate, in accordance with section seven below (work plan and timetable) the number of days considered necessary to carry out the field work and data collection in Somalia. This is not envisaged to exceed 10 days per project.

A detailed budget/cost estimate should be submitted under separate cover at the same time as the technical proposal.

3. Issues to be covered

The following are some of issues to be included in the evaluations:

- Project design and its relevance - Extent to which the project has been consistent with, and supportive of, the policy and programme framework within which the action is placed; consistency between the planned resources, activities, outputs and objectives; adequacy of the project institutional arrangements.
- Project management and internal coordination arrangements, and the extent to which timely and appropriate decisions were made to support effective implementation and problem resolution.

- Stakeholder involvement and participation in the management and implementation of the project, the level of local ownership, as well as beneficiaries' satisfaction.
- Performance - Efficiency (input delivery, cost control and activity management).
- Effectiveness (delivery of outputs and progress towards achieving the purpose).
- Contribution to impact, including possible unexpected outcomes or results.
- Sustainability (to what extent project achieved results so far are likely to be operated and maintained in the long term).
- Cross-cutting issues – gender and environment consideration in implementation of the project.
- Replication – analysis of replication potential of project positive results.
- Quality of works implemented in relation to technical specifications and standards.
- The EC visibility is also to be considered.
- Co-ordination with institutions and agencies (e.g. Local NGOs; Ministry of Livestock, Agriculture and Environment; INGOs; etc.).

4. Approach / Methodology

The approach should be impartial, independent, and credible. It is expected that the different project stakeholders will have the opportunity to express their views and that recommendations will be useful and applicable by the project management.

The consultants are expected to conduct a thorough assessment of relevant project documentation and products as well as internal management practices. Interviews with key project personnel and collaborators should be conducted as well as with key stakeholders and beneficiaries

The evaluations should be in line with the EC evaluation guidelines and principles and tools of Project Cycle Management (PCM). In particular, they should evaluate links of the projects to the EC Strategy for Somalia (2002-2007) (SISAS).

The methodology to be used in conducting the evaluations and tools for the same, taking account of the above considerations, should be included in the technical proposal by the Consultancy Firm.

The selected consultants will be provided with the following documents for reference:

- The SISAS (EC Strategy for the implementation of special aid in Somalia 2002 – 2007)
- The project proposals including the log frame and budget
- The project reports (Inception, Summary and interim reports and financial reports)

5. Expertise required

The team will be composed of two experts, one Team Leader and one Technical Specialist. To the extent possible, they will work and travel as a team to cover both the CEFA and the Agrosphere project activities.

The Team Leader should have at least 10 years experience of rural development project management with a good knowledge of project cycle management, monitoring and evaluation.

The Technical Specialist should have a degree in civil engineering, irrigation or related field, and demonstrable experience in designing, monitoring and/or evaluating irrigation structures and projects.

Some experience of similar EU funded project evaluation is required, especially for the Team Leader. Significant field experience in Somalia would be a strong asset.

6. Reporting requirement

Two separate reports, one for the project implemented in partnership with CEFA and one implemented by the project implemented in partnership with Agrosphere will be prepared. The preliminary draft report should be submitted, electronically as well as printed, to the contract authority within 10 working days following the presentation of findings and preliminary recommendations to the project management. The final report should take account of comments received and be submitted no later than one month after submission of the initial draft report. Aspects common to the two projects should be included in reports of both projects.

Each final report should include:

- An executive summary (no more than 5 pages) focussing on critical points of the analysis with the main conclusions and recommendations
- A main text, including description of the project and analysis according to the evaluation criteria
- Conclusions and recommendations

Annexes of the report should include:

- Terms of references of the evaluation
- Name of the evaluators and their company (this should NOT include substantial information on company activities)
- Methodology applied
- Logical framework (original and updated)
- Map of the project intervention
- List of documents consulted
- List of persons and institutions met during the missions

7. Work plan and time table

The proposal from the Consultancy Firm should present a detailed work plan for each evaluation which should set out the consultants' schedule for the following activities:

- Preparation in Nairobi: Meetings in Nairobi with IO, CEFA/Agrosphere and EC Somalia Unit; review of secondary data
- Meetings with project staff and stakeholders in Somalia
- Field work, data collection in the field and meetings with communities key respondents
- Presentation of findings and preliminary recommendations to the project management.

All the above activities should take place within a period of two weeks.

The following additional activities will be realized:

- Preparation of draft reports;
- Discussion of draft reports with the project management of IO, CEFA/Agrosphere and EC Nairobi
- Finalisation et presentation of evaluation reports

The final reports should be delivered no later than one month after the submission of the initial draft reports.

The field work for the Evaluation of the project implemented in partnership with CEFA should take place in February 2008. Any additional field work required for the Evaluation of the Agrosphere project should take place in March 2008.

8. Assistance to the Consultancy Firm from the Contracting Authority and its partners

IO, CEFA and Agrosphere will make available the following information and facilities required by the consultants in the course of their assignment:

- Relevant reports, documents, maps, data in Nairobi and Somalia;
- Office space, furniture, access to a computer, printers, stationery and communication facilities in the field;
- Project budget and record of expenditures to date.
- The use of project vehicles and drivers in the field;
- Facilitation of travel to Somalia.

APPENDIX 2: FIRM AND CONSULTANTS PROFILES

a) Acacia Consultants Ltd Profile

Founded in 1995, Acacia Consultants Ltd. is a Kenyan based consultancy company that specializes in providing technical assistance and advice in the areas of livelihoods and food security, natural resource management and social and organizational development. Acacia has profound knowledge of the arid lands both from a technical and an institutional point of view. It is a full service provider with access to the management resources required to deploy and support technical assistance teams on the ground.

Acacia's *Vision* is 'Poverty reduced in the Greater Horn of Africa through empowered communities sustainably achieving their livelihood goals'. Acacia's *Mission* is 'to provide clients and partners independent and high quality consultancy services in order to enhance the capacities of marginalized women and men to exploit appropriate technologies and to secure their basic rights'. Guided by these, the company has grown from a common interest in the development of livelihoods and pastoral lands in East Africa. Acacia's areas of expertise have expanded both geographically and sector-wise to provide high level expertise in programme and project design, policy formulation, monitoring and evaluation, training and facilitation, applied research, financial and other services. Acacia advocates rights-based and livelihoods approaches and believe it is essential to promote sustainable use of natural resources and mainstream issues of HIV/AIDS and gender into any intervention in order for it to be effective in the long term.

Acacia's technical services are offers services in the following areas:

- Relief and development,
- Multi-sectoral Development (Integrated programmes).
- Social Development (health and education) ,
- Food Security, Agriculture and Livestock Development,
- Conflict and Disaster Management,
- Small and Medium Enterprises and Trade,

Crosscutting issues: Acacia believes that it is essential to address and incorporate the following themes in programmes at all levels, as these are cross-sectoral and fundamental to poverty alleviation. The Acacia experience and expertise covers these issues:

- Environmental sustainability
- Gender equity
- Civil society and private sector partnerships
- HIV/AIDS

Technical skills and services: The attainment of Acacia's overall goal is achieved through the provision of the following key services;

- Natural resources inventories
- Livelihood and food security assessments
- Research studies
- Capacity development
- Programme and project design
- Monitoring and evaluation
- Institutional Development
- Policy Formulation

Administrative and Financial Management Services: Acacia offers a full range of administrative and financial management services in support of all technical assignments. This includes the control, management and reporting of the use of funds, the establishment of budget control systems to ensure transparency in expenditure, recruitment, placement and management of personnel, logistical services and support to field teams, contract management and all associated administration and liaison.

Acacia's clients: Acacia has a long history of involvement in donor-funded assignments, and clients have included bi-lateral agencies (RNE/DGIS), DFID, Sida, JICA, USAID etc), multi-lateral agencies (WFP, UNICEF, UNDP, FAO, EU, World Bank), national governments (Kenya, Ethiopia, Somalia, Uganda etc), international and national NGOs, research and community Groups.

Human resources of Acacia: Field experience by Acacia staff dates back to the early 1980s with professional involvement in relief and development of over 10 years. There are five permanent employees of Acacia Consultants Ltd and 30 close associate consultants providing services to clients through Acacia giving the company an extensive breadth of experiences working in environmental and natural resources management and livelihoods development. In addition to the core professional staff, Acacia has an extensive pool of international and local consultants who provide services on a short-term basis.

b) Consultants Summarised Profile

1) **Martin Kamau – Team leader and M&E Specialist:** Mr. Kamau is a highly experienced program development and monitoring and evaluation specialist. He has worked for over 10 years with communities in Kenya, Uganda, Somali and Sudan as a socio-economist and CBNRM expert. He has carried out numerous evaluations and socio-economic studies. As a community development practitioner, he has assisted in developing training manuals to various development organizations and conducting Training of Trainers for effective utilization of the tools and techniques in the manuals. These manuals include project cycle management. Recently (2008) he trained CDTF's supported forest associations in Nyandarua and Laikipia districts in attempt to promote their planning and managerial skills while applying project cycle management approach and tools.

Towards the end of 2007 and into 2008, he was the principal socio-economist in the evaluation of the Concern World Wide food security programme evaluation. He was the Lead socio-economist for End of Project External Evaluation for COOPI's Pastoralist Livelihood Emergency Assistance in Sool, Sanaag (Somaliland) and Bari (Puntland) regions funded by EC; principal socio-economist for the Evaluation of Plan International's Family and Basic Community Services Programme and was contracted by International Institute of Environment and Development (IIED), London, to carry out evaluations of Agenda 21 programmes of Jinja Municipality. He was also the lead consultant in conducting evaluations for Early Child Development Programmes, touching on child care; hygiene (including water and sanitation) and child education projects developed and conducted by SAIDIA (Samburu Aid in Africa); Water development projects by Semi Arid Rural Development projects (SARDEP in Laikipia and Kajiado Districts; and Arid and Semi Arid Lands, Laikipia (ASAL, Laikipia. He has also acted as the Principal socio-economist in numerous Environmental Impact Assessments and Audits. In particular he was the principal consultant in the Environmental Impact Assessment for the Alternative Livelihoods Area Economic Recovery Programme, a Horn Relief Programme in Somaliland.

2) Engineer C.G. Kamau - Technical Expert: Eng. Kamau is a specialist in all aspects of Water and Sanitation; water resources, water supply, sanitation and other social infrastructure formulation; design, implementation and operation/maintenance management; Environmental Impact Assessment and Audit , Supervision and Construction Management of Integrated Engineering Works. In the recent past he has been actively involved in the Value for Money technical and environmental audit of

several water and sanitation projects in Kenya. He has over thirty years' hands on experience in civil engineering projects. Among the projects he has been involved in within the last five years includes: Value for money technical and environmental audit of water and sanitation projects in Kenya. His responsibility included the overall organization and administration of the technical matters, Environmental and Technical Audit of Nairobi City Water and Sewerage Company facilities, including project roads network, Water resources assessment for the Design of 35 m high earth dam serving Tiomin Kenya, Material Investigations for the construction of earth dam, client- Tiomin Kenya Ltd, Environmental Impact Assessment of Tiomin Dam Design of 35 m high earth dam for Tiomin Kenya Ltd., Detailed design of small scale irrigation gravity fed schemes and access roads - covering 400 hectares, Environmental Impact Assessment of roads within Mount Kenya East Pilot Project on natural resources, EIA of small scale irrigation projects within Mount Kenya Region, Design of water for low income communities in Meru and Mbeere Districts, Review of Final design of Shire Valley irrigation & infrastructure roads Project Malawi – 2005 and the preparation of EIA reports etc. He has worked in Malawi, Mozambique, Tanzania and USA

APPENDIX 3: METHODOLOGY APPLIED

a) Data collection tools development

The main methodology applied was the review of the project documents, interviewing key resource persons in Nairobi and in Somalia and the targeted beneficiaries within the project area. Fieldwork visits and validation interviews with the administrations and the contractors were conducted. The study itinerary is presented as section “e”, below.

The team travelled to Somalia for fieldwork. The team targeted beneficiaries within the canals command areas for interviews, site visits for validation. The interviews with the administrations and the contractors were also conducted. In addition, in preparation for interviews with targeted households, the evaluation team had developed semi structured checklist questionnaires mainly to assess change brought about, especially in crop production, by FAO and CEFA irrigation rehabilitation and the associated interventions, see section “c” and “d” below, for tools used for data collection.

The consultant when they visited the field, however, noted the reality on the ground was different in that apart from Bakoro canals that had initiated crop production and some of the farmers obtained minimum yields, active production was generally yet to be achieved. As such, it was only part of one of the tool which was partially applicable specifically to Bakoro canal farmers. This checklist was administered to 17 contact farmers and canal committee members out of the 30 who were undergoing capacity building training at Jerrow village (See section” c” below). The trainees had been drawn from the 16 villages scattered over the Bakoro canal command area. The participants were randomly selected, though purposively, as informed by the CEFA’s field technical personnel. The contact farmers were described to represent people who are active and willing to take the roles of contact farmers. Many of them are innovative and have good public relation. Canal committee are people purely selected by farmers based on their capacity to manage and provide good leadership and represent various clans. People are settled on clan basis. According to the technical team, the people interviewed give a good representation of the community in the village. The checklist provided some basic quantitative data on crop production in Bakoro canal where farming has resumed (see data collection tools “c” and “d” below).

b) Limitation to the evaluation

The project implementation was focused on rehabilitation and upgrading of the canal systems. These interventions will primarily benefit those farms that were originally served. The project documents were detailed enough for the purpose of implementation. However, there were no project documents prepared for operation and maintenance of the rehabilitated facilities. Other limitations were:

- Low literacy levels
- Authorities and Governance (most of the Regional authorities were outside Merka during the e time of the review.
- Security situation in Somalia still remains a delicate issue and consultants were unable to make extensive visit to project area either to interview the beneficiaries or validate the activities accordingly. However, it is the opinion of the evaluation, a fair judgement made from people interviewed and site visited given the circumstances on the ground.

c) *Table 5: Tool for Collecting Crop Production Data* (Yields Realized from five main crops Grown in the Last Season and Utilization Estimates

Farmer's Names	*Crop Types*	*Yield*	*Area Cultivated*	*Utilization Estimates of the Crops Harvested*							
				Amount Consumed	*Amount Stored*	*Amount Sold*	*Where1*	*Price1*	*Where2*	*Price2*	*Comments*
	2										
	3										
	4										
	5										

d1): ***Table6: Tools used for planned and achieved outputs for measuring Project implementation Effectiveness***

Expected Results	***Activity Indicators***	***Planned***	***Actual***	***Remarks/Comments***
		No.	*No.*	
Planned Date of the project commencement				-Project implementation planned to start as from 15/03/06 but commenced on 01/07/06 -Project take off delayed mainly due to insecurity and floods prevailing in the project area
OVERALL OBJECTIVE				
Household income of rural families increased through improved agricultural production.	Household incomes of rural families increased by at least 15% compared to incomes before action implementation.			
	At least 75% of the target farm families undertake improved agricultural production.			
PURPOSE				
Farmers in the former banana growing regions have access to and use irrigation infrastructure in a productive and appropriate way.	4 sub-command irrigation systems in Merka and Qoryooley districts with a total of 23,170 ha rehabilitated during the project period.	4	2	-Bakoroo and Fornari are complete. - Liban and Buffow canal are not yet done
		23,170 ha	5797.5[6]	-Bakoroo canal with 5 structures completed[7]. -Fornari canal with 5 structures is complete[8]. -Liban canal has been surveyed and preliminary design done[9]. -Estimate for rehabilitation of Bufo canal off-take has been done. This canal commands an area of about 3,500 ha. This will be an extra addition to projects expected area of coverage. Rehabilitation will start soon. - Design for 2 Farm Produce Market structures has been done. These are Bufo and Golwein areas.

[6] Bakoro Canal is under irrigation where close to 75% of the irrigable area is under crop production. Computation of total area under active production is a percentage of the entire Bakoro canal command area of 7,730 divided by 75% of the area under crop production currently.

[7] The length of Bakoroo canal is 15.85 km long a command area of 7,730 ha. The area under crops is almost 75 % of the total area. The villages cover by this canal is Farhane, Abdi Ali, Jerow , Bufow Osbole and Bulo-Marerta .

[8] . Length of Fornari Canal is about 6.3 km and it commands an area of 3,610 ha. It covers Bulo Sheikh, Berda Salah, Madulow, Bulo Tunni and Golweyn villages

[9] Liban Canal is about 12 km long with 7 structures. It's expected to command an area of about 5,500 ha. Rehabilitation will start soon.

	At least 3,000 farm families have improved agricultural production through use of irrigation and diversified cropping during the project period.			
	At least 3,000 farm families practice improved soil and water use and management during the project period.			
	At least 1,000 farm families practice market-oriented farming for 2 seasons targeting local and export markets during the project period.			
	At least 2,000 farm families receive services from strengthened relevant organisation and administration.			
Through PRA and together with farm families in Merka and Qoreyooley former banana growing areas determine infrastructure to be rehabilitated within the Primo-Bakooro-Fornari system and the SHARP-Cessare Maria system.	Number of PRA sessions conducted		-10 for Bakoro, Fornari 4 and Primo Secondario 2	PRA sessions completed
	Total length of canals rehabilitated[10]	79.3	44.3	-Only Bakoro and Fornari canals have been completed -The 35 long Primo-Secondario was replaced with 12 km long Liban canal after the former was rehabilitated by community members
	Number and description of infrastructure to rehabilitate and geo-referenced	4 sub-command irrigation systems with a total of 23,170 ha	2	
Undertake technical appraisal of hydraulic structures including intakes and culverts within selected system(s)	Number of hydraulic structures appraised (details of rehabilitation requirement documented and geo-referenced)	Superstructure and structure of 4 barrages appraised	Superstructure and structure of 4 barrages appraised	Hydraulic structures appraised during canal excavation and design and BoQ for the rehabilitation for Liban[11]

[10] canal lengths, culverts, intakes, cross regulators, off-takes and access roads from the canals Primo-Secondario (35 km), Fornari (12.8 km), Bakooro (31.5 km) and cross regulators on Bufow canal (Cessare Maria)

[11] All four river diversion structures namely Janaale, Mash allay, Qoreyooley and Farkeroow barrages have been appraised in close collaboration with DIALS , PACSU, FAO and FAO SWALIM. GPS coordinates for the four structures have been determined

Undertake necessary survey-topographic or profile for the selected infrastructure including irrigated areas, roads, canals drains, culverts and reservoirs	Number of topographic and profile surveys conducted and documented	[12]	-Profiles completed -3 structural survey done and the remaining one ongoing	-Profile and cross-sectional survey of canal Primo Secondario was completed in July 2007 (the canal was eventually replaced with Liban). -Profile and cross-sectional surveys of the Bakooro, Fornari and Liban canals had been completed by January 2008[13]
Design and prepare BoQs for selected infrastructure rehabilitation	Number of sub-command irrigation systems, barrages re-designed	Designs and/or redesign, engineering drawings and BoQs for the 4 sub-command irrigation systems, 4 barrages and 1 link prepared	- 4 designs complete	BoQs for hydraulic structure for Bakoro, Fornari and Liban canals completed - Bufow canal cross-regulator estimates for rehabilitation are ongoing after agreement with relevant stakeholders.
Contract, undertake and supervise infrastructure rehabilitation	Status of contract with contractors	[14]		-COMORAD a local organisation based in Mogadishu and operating in Lower Shabelle was contracted to undertake rehabilitation of 3 cross-regulators and 2 culverts on the Bakooro canal. The works have been completed Bakoro and Fornari canals excavation works have been completed and supervised by project staff
	Status of contract with farmers			
In collaboration with FAO implemented EC funded SWALIM gather relevant soil and water use and management information	Status of SWALIM database on soil and water resources		Bakoro database in place and shared with SWALIM	Spatial data for Fornari gathered ready to be shared with SWALIM -In September a second GIS consultant was hired to complete the mapping of rehabilitated irrigation canals and infrastructures

[12] Topographic, longitudinal and cross-section profile or elevation-profile surveys for the selected infrastructure including roads, canals, drains, culverts, regulators and the Mashalay-Primo link carried out.

[13] The survey on the culverts and regulators on Bakooro, Fornari canal was completed in October 2007. Survey of the culverts and regulators on canal Liban canal will be undertaken in April 2008 after the silt covering the structures will be removed by the farmers.

- A total of 5 profile and cross-section surveys have been carried out to date for the three sub-command irrigation systems namely Link to Primo Secondario from Mashallay barrage, Bakooro canal, Fornari canal, Liban and Primo Secondario canal

[14] MoUs between the project and benefiting farmers and contracts with contractors will be signed and relevant physical implementation.

Develop farmer training package for appropriate soil and water use and management	Number of leaflets produced on sustainable farm management, including soil management and water management	Development of the module based farmer training packages on appropriate soil and water use and management	Training materials developed	Materials developed on water management, bye-laws, nursery management. - The translation of all produced manuals into Somali language is ongoing
Undertake farmer training on appropriate soil and water use and management	Number of training sessions conducted Number of farmers involved in training sessions on farm management	Farmer field school based farmer training on appropriate soil and water use and management will be carried out during the project period	-Training for Bakoro and Fornari Canals (Primo Secondario also undertaken but has been replaced)	Bakooro – rules and regulation on water sharing and management; irrigation system operation and maintenance developed Training sessions continued with both Fornari and Primo Secondario canal committees and water users of the 2 canals
Facilitate establishment of functional water users association	Number of WUA set-up and functioning	At least 4 system based water user associations will be established	Training held in line with the developed training materials	Training activities have been started and will be reported in details with next technical report.
Facilitate development of water users' by-laws	Status of water users' by-laws regulation/policy	[15]	Bakoro Canal user's by-laws developed and in use	
Undertake a target area community baseline survey	Status of baseline survey Number of groups assessed Number and relevance of impact indicators	Baseline survey undertaken	Not done	Due to security concerns at the start of the project the projected target area community baseline survey was never undertaken. However a status quo survey has been planned and will be completed by next period.
Undertake training of staff in participatory approaches including PRA, PLA, PIM and FFS	Number of training sessions conducted		Follow up on staff training and training on PIM	Local staff previously trained in FFS and PRA participated in FSS training for farmers in nursery establishment. Reports under preparation.
	Number of staff trained in PRA, PLA, PIM, and FFS			
	Number of staff able to conduct PRA, PLA, PIM and FFS activities			
Through participatory process determine preferred	Number of crops identified	Preferred crops	Mapping of local	A total of 26 crop varieties were identified during the last report

[15] Development of the formal by laws based on the documented process will be supported and facilitated

crops (food, fruit trees, cash crops & forage) to include in the cropping systems	Mapping of localized preferred crops available	determined	preferred crops	period, see 3rd Narrative report.
Undertake local markets survey for farm production based on preferred crops	Number of market surveys conducted	?	1	-SAM SAM is expected to provide the local markets information
	Market places geo-referenced		Ongoing	TOR for local markets survey was prepared in October 2007 and a consultant recruited. The study is ongoing
	Database developed			
Together with farming communities in the target area select representative contact farmers	Number of representative contact farmers identified and selected	200 representative contact farmers selected from the different sub-command systems areas	-Bakoro and Fornari farmers' representative selected and MoU signed	Sign Memorandum For Liban and Bufow canals, selection will follow soon.
	Number of farmers trained	?		
Procure plant materials and other farm inputs for different varieties of preferred crops	List of inputs to procure finalized and contracts signed	[16]	Material for Gu 2008 procured and used	-Seeds, agrochemical, tools and equipment and other farm inputs for different varieties of preferred crops were procured for use in the demonstration plots. -Planting and seeding of the plant material in project established nurseries and demo-plots are ongoing.
Undertake adaptive test trials for the different varieties of preferred crops	Number of trails developed	?	- Trial and data collection and analysis made for Fornari and Bakoro canals	-Test to be undertaken for selected crops in liban and Fornari irrigation systems - Three nurseries/demo-plots have been established and crops that require transplanting sown
	Number of crops selected	?		
Gather relevant agronomic information on preferred crops and develop module based agricultural production training materials and packages	Number of technical literature identified and made available to the project	first module based agricultural production training materials and packages	-5 module based training packages will be developed during this period	The following have been produced: 1. Farmers training manual; 2. Field technicians FSS training manual; 3. Farmers FSS training package; 4. Nursery management training package; 5. Water management training package;
Undertake demonstrations and skills training sessions on selected variety of preferred crops based on training materials and packages	Number of training sessions conducted	?	- FFS based farmer training to be undertaken	Demonstration and training based on the module based training packages to start – Farmers from Bakooro, Fornari and Liban system will be trained
	No. of demonstration plots constructed			
	Number of farmers involved in training sessions			

[16] Based on the preferred crops adapted varieties, pure seeds will be procured or obtained from seed research institutions. At the same time other farm inputs will be procured

Undertake plant material multiplication, selection and treatment for selected variety of preferred crops	Number of varieties selected for multiplication	?	- Multiplication undertaken in the demo plots as well as training	Plant material identified and purchased during the period; multiplication to start as bakooro & Fornari canals have been rehabilitated.
	Multiplication ratio	?		
	Quantity of planting material multiplied	?		
Distribute preferred plant materials and train farmers on appropriate cropping systems	Number of farmers receiving inputs	?	Farmers to receive plant material and seeds identified	Ongoing.
	Number of farmers trained	?		
	Quantities distributed	?		
Establish marketing information system, update the system and disseminate the information on weekly basis	Frequency of market information dissemination	Weekly basis	LOA to provided resources for marketing activities established with FAO, modalities for market information established	Ongoing.
	Number of farmers accessing market information	?		
Together with the selected representative contact farmers prepare and implement production schedules based on different selected crops mixes (cropping patterns) based on soil constraints, water availability, cropping calendar, rotational constraints, crop relative profitability and labour availability	Number of markets supplied with agricultural products from project area	?	-Not done	Planning for production schedules started
	Incomes generated by farmers	?		
Develop and implement cropping patterns incorporating fodder trees and forage crops that maximize farm incomes and natural resource conservation	Incomes generated through fodder and forage crops	?	-Not done	Cropping patterns will be developed during the Jilal 2008 and implemented during the Gu 2008
	Health status of the livestock	?		
	Number of trees planted and varieties re-introduced	?		
Undertake international markets survey for farm production based on cropping patterns	Status of international markets documented	[17]	Started	-SAM SAM will provide international market information[18]

[17] An international markets survey targeting farm products for preferred crops undertaken. The international markets study will also establish required trade regulations for the target market and / or blocks. Based on the

Harmonize local and international market survey results and production plans to ensure constant supply and stable farm produce prices	Specification for products to be marketed available		-Not done	-To be done following the market study results and with the collaboration of SAMSAM project
Sensitize traders and facilitate contacts and linkages with international market instruments	Number of locals traders linked with international markets			
Together with target communities identify relevant service and support organizations including water users, marketing, agricultural advisory services, village development organizations, professional associations and farm input services[19]	Number of support services and/ organizations identified	?	-Ongoing	-Janaale Rice Growers Association, Hadhuman Rice Growers Association and Golwen women farmers group have been identified. The Banana Growers Association has also been identified as reference for the banana sector
Undertake a study of target area community social groups and their interactions	Number of social groups identified	?	-Started	- Waiting for the market study report to be finalised.
Appraise capacities of service and support organizations and facilitate their capacity improvement	Number of identified services and social groups appraised			Capacity appraised through PRA approaches and MoU based on the action plan signed specifying capacity improvement to be provided. This will follow the completion of the identification process still ongoing
Facilitate farmer organization or private based marketing of farm produce	Number of farmer's organization facilitated in market linkages		-Ongoing	Skills appraised through PRA approaches and MoU based on the action plan signed specifying area of skills improvement to be facilitated
Facilitate access and compliance to regional and international trade regulations	Number of farmer's organization facilitated in market linkages	?		To be finalised and implemented by next period
Facilitate appropriate skills and knowledge development of relevant service support organizations including water users, marketing, agricultural advisory services, farm inputs services and professional associations	Number of FFS based training organized	?	-Ongoing	-A training and support to the Banana Growers Association has been implemented by FAO. -Training to other identified service organisations to be finalised and implemented by next period
	Number of farmer's groups involved in training	?		

trade regulations the project will advice farmers on the required inspections and certification and where possible establish channels through which some of the services can be provided.

[18] However, this output is felt to have been overemphasized and it is likely that it will not be pursued further.

[19] During the project period, at least 3,000 farm families will receive services from strengthened relevant organizations and administrations strengthened to fulfil their functional role.

Sensitize traders and shopkeepers on appropriate farm inputs	Status of linkage between farm input supplier and farm-input consumers (backward production linkages)		?	

d2): ***Table 7: Tools used for Technical Specification assessment for Effectiveness***

Bakoroo Canal

Irrigable area (ha)	7,730
Flow (l/s)	11,595
Canal bed slope (%)	0.012
Canal side slope	1:1.5
Canal bed width (m)	4.5
Canal depth (m)	3.45
Canal top width (m)	14.85

Fornari Canal

Irrigable area (ha)	**3,610**
Flow (l/s)	5,415
Canal bed slope (%)	0.013
Canal side slope	1:1
Canal bed width (m)	4
Canal depth (m)	2.6
Canal top width (m)	9.2

Liban Canal

Irrigable area (ha)	5000
Flow (m^3/s)	7.73
Canal bed slope (%)	0.013
Canal side slope	1:1.5
Canal bed width (m)	4.14
Canal depth (m)	1.66
Canal free board (m)	0.28
Canal top width (m)	9.11

Equipment and works per the Project Plan	**Design Specifications**	**Achieved Specifications of equipment and works.**	**Comment on variance**
Scheme design	All schemes are designed separately. They share same soil, crops, hydrological and weather data.	All achieved	The scheme area are different, hence difference in scheme water demands.
Irrigation water demand	Water demand for all irrigable area has been based on reported gross irrigation need of 1.5 l/s/ha that was determined by a study conducted during the Somali Government period within the Shabelle basin. If can also be calculated by using Lower Shabelle's (moderate temperatures) with ET of 5 - 6 mm/day (An average figure of 5.5 mm/day can be used). This gives 1.546 litres/second/ha	All achieved	The scheme area are different, hence difference in scheme water demands.

Water resources planning	We are rehabilitating what use to exist. This was not carried out		There are some data collected upstream and down stream of our current off takes at few gauging stations. There are with SWALIM. It also includes few meteorological data. Currently there enough water to meet our scheme water requirement. No data is available on low, flood and probability of flows. In order to ensure the possibility of attaining maximum yields and returns for the farmers, the amount of water available must be determined.
Water rights	Not indicated		Currently there is sufficient flow throughout the year. Sufficient flow must be maintained in the river throughout the year to meet the needs of downstream users.
River basin study			
Seepage losses	Low seepage loss. Main losses is from few secondary canals(no proper structure and control gates) Permeability tests were not carried out during the design.		The design documents for each canal has provided all necessary specification for the canal bed width and slope, top width, side slopes and shape. The design report did not provide the specification for the canal bed and embankment.
Irrigation efficiency	Losses occur during conveyance, distribution and application. The irrigation efficiency is estimated to be 45 -50%. This was not technically determined		
Construction equipment	Bulldozers and excavators are used for canal rehabilitation		They are performing well.
Main canal	The project is only working on the main canal. All hydraulic parameters have been given in the design documents.		

	Hydraulic performance parameters were not indicated		
Secondary canals rehabilitated	Not in project domain		
KM of farm access roads rehabilitated			
Bed slope	Bed slopes of the canals have been given in the design document. The slopes are 0.012-.0013 %. There controlled by the general land topography. They allow water to be conveyed properly.		
Embankment slope	Embankment slopes of the canals have been given in the design document t (1:1 – 1:1.5).		
Spatial data collected and shared with SWALIM			
Flow measurement	No gauging station along the river within the area.		
Intake Works			

Note that there are no diversion works into the canal

Control works	There structures and some with gates along each canal for water control.		All working
Water quality	Water is good for irrigation		There is some sediment in water.
Ha irrigated after rehabilitation works			
Water availability at farm level			
Water scheduling/distribution/operation			
Water handling at plot level			
Land slope			
Drainage	Not yet done.		Its necessary if technically determined for all the canal

Night storage	Only constructed along Bakoroo Canal. It's necessary for all the canals.		It's recommended for Fornari and Liban canal.
Compaction control	No specification		Proper Compaction is important to reduce seepage
Pump house and equipment			
Type of embankment			
Water losses	Allowable losses per meter length of canal not determined		Amount Water lost through seepage is important in determining irrigation efficiency
Foundation treatment			
Training provided			
Handing over			
Erosion and sedimentation	Sediment load analysis was not estimated		Sediment transporting power of canals is less than the parent river. Deposited sediment reduces the capacity of canals.
Environmental impact assessment			
Health and Sanitation	Domestic water supply and sanitation were not provided for.		Health and sanitation training empowers the community to deal and avoid occurrence of common health and sanitation problems.
Water related diseases			
Food availability			
Gender distribution			
Progress reports			No regular and clear updating and reporting procedures have been established There is no guidance provided on how to measure progress
Monitoring and evaluation	This was not a requirement		No regular reporting obligations and standards have been established. Funding for monitoring

			and evaluation not secured
Water users association			Quorum not indicated
Productivity (yields)			
Crop choice			
Canal maintenance			
No of gates rehabilitated			
Access to agro-inputs			
Crop marketing			
Extension services			
Land tenure			
Labour availability			
Credit			

e) **ARDOPIS CEFA Evaluation Programme**

Date	Activities	Time
Planning and Debriefing Meetings in Nairobi		
22/02/08	-Debriefing at FAO Somalia Office -Debriefing at Agrosphere Office -Debriefing at CEFA Office	-10.00 -12.45 -14.25-16.00
Fieldwork Programme		
01/03/08	-Evaluators' arrival from K50 to Merka CEFA base -Meeting CEFA staff at Merka base	-10.15 -12.00 -14.00-16.00
02/03/08	-Leaving Merka base for field visit -Meeting the committee at Bufow on Market issues -Visiting Bufow X-regulator -Access roads (Golweyn- Madhulow & Madhulo Jerrow -Touring Bukoro Canal (intake to the drainage) and Reservoir -Meeting the canal committee of Bukoro -Visiting farmers training in session & demonstration sites -Visiting Simsim Contracted farmers	-7.30 7.50-8.20 8.40-9.00 -9.00- 10.00 -10.00- 14.00
03/03/08	-Leave Merka base -Meeting Liban canal committee -Touring Fornari canal -Debriefing -Departure to Dar-es-salaam	-7.30 -10.30-12.30 -14.30

APPENDIX 4: LOGICAL FRAMEWORK (ORIGINAL)

Table8: Original Project Logical Framework

Project Description		Indicators		Source of Verification		Assumptions
OVERALL OBJECTIVE						
	Household income of rural families increased through improved agricultural production.	1	Household incomes of rural families increased by at least 15% compared to incomes before action implementation.		Baseline survey reports, Household economy survey, FSAU and FEWSNET reports.	
		2	At least 60% of the target farm families undertake improved agricultural production.		Project reports, PACSU reports, FSAU reports	
PURPOSE						
	Farmers in the former banana growing regions have access to and use irrigation infrastructure in a productive and appropriate way.	1	At least 150 km of small primary canals and 40 km of secondary canals are rehabilitated.	1	Quarterly Progress reports, final project report, Mid term and final evaluation reports	1. Market prices for farm surplus and cash crops allow the farmers to break even. 2. Relief food distribution does not take place in project area.
		2	8,000 ha of irrigated area developed.	2	Quarterly Progress reports, final project report, Mid term and final evaluation reports	
		3	At least 60% of the farmer population in the target area have access to adequate irrigation water and utilize this water appropriately, cropping plans and patterns.	3	Quarterly Progress reports, final project report, Mid term and final evaluation reports	
		4	At least 3,000 farmers will be trained in improved agricultural practices including adapted irrigation techniques, through contact with the farmer trainers and relevant farmers' organization.	4	Quarterly Progress reports, final project report, Mid term and final evaluation reports	
		5	At least 5,500 farm families receive services from strengthened water users associations and village development	5	Quarterly Progress reports, final project report, Mid term and final evaluation reports	
EXPECTED RESULTS						

Project Description		Indicators		Source of Verification		Assumptions
1	Selected irrigation systems are rehabilitated and functional.	1.1	Number of infrastructures rehabilitated	1	Quarterly reports	Favourable climatic conditions (no extraordinary floods)
		1.2	Kms of canals rehabilitated	2	Quarterly reports, appraisal report	
		1.3	Number of hectares under irrigation	3	Quarterly report, Survey data and maps	
2	Improved agricultural production using irrigation and diversified cropping is practised on traditional farm land.	2.1	Number of trained farmers involved in sustainable crop production	1	Quarterly report, baseline survey report	Security prevails
		2.2	Number of varieties selected for crop diversification	2	Quarterly report, activity report	
		2.3	Itemised Production (tonnage) available for local and regional	3	Quarterly report, needs assessment report	
3	Relevant organisations and administrations strengthened to fulfil their functional role.	3.1	Number of organization identified and supported by the project	1	Quarterly report	Market niche exist regional and internationally
		3.2	Status of rural growth linkages (consumption linkages, backwards production linkages and forward production linkages)	2	Quarterly report, study report	
ACTIVITIES						
Project Description		**Indicators**		**Source of Verification**		**Assumptions**
1.1	Through PRA and together with participating farm families determine flood fed irrigation infrastructure systems to be rehabilitated.	1.1	Number of PRA sessions conducted List, number and description of infrastructure to rehabilitate and geo-referenced	1	Quarterly report, baseline survey report	1. ECHO continues to provide flight services to Somalia. 2. Security situation remains conducive for project implementation. 3. No major interruptions occur during the project implementation period 4. No major calamities occur during the project implementation.
1.2	Undertake technical appraisal of hydraulic structures including intakes and culverts within selected system(s).	1.2	Number of hydraulic structures appraised, including details of rehabilitation requirement documented, and geo-referenced		Quarterly report, activity report	
1.3	Undertake assessment of pumping set requirement for systems included in the community action plans (CAP).	1.3	Number of pumping sets estimated for the project		Quarterly report, needs assessment report	
1.4	Undertake necessary survey – topographic or profile for the selected infrastructure including irrigated areas, roads, canals, drains, culverts and reservoirs.	1.4	Number of topographic and profile surveys conducted and documented		Quarterly report, survey report	

Project Description		Indicators		Source of Verification	Assumptions
1.5	Design and prepare BoQs for selected flood fed (Dashek) irrigation infrastructure systems	1.5	Number of irrigation infrastructure systems re-designed	Quarterly report	
1.6	Contract, undertake and supervise infrastructure rehabilitation.	1.6	Status of contract with contractors Status of MoU with farmers	Quarterly report, activity report	
1.7	In collaboration with FAO implemented EC funded SWALIM gather relevant soil and water use and management information.	1.7	Status of SWALIM database on soil and water resources	Quarterly report, activity report	
1.8	Develop farmer training package for appropriate soil and water use and management.	1.8	Number of leaflets produced on Sustainable farm management, including soil management and water management.	Quarterly report, activity report	
1.9	Undertake village farmer's group training on appropriate soil and water use and management.	1.9	Number of training sessions conducted Number of farmers involved in training sessions on soil and water management	Quarterly report, activity report	
1.10	Facilitate establishment of functional water users association.	1.10	Number of WUA set-up and functioning	Quarterly report, activity report	
1.11	Facilitate development of water users' by-laws.	1.11	Status of Water users' by laws regulation/policy	Quarterly report, activity report	
2.1	Undertake a target area community baseline survey.	2.1	Status of baseline survey Number of groups assessed Number and relevance of impact indicators	Quarterly report, activity report	
2.2	Undertake training of staff in participatory approaches including PRA, PLA, PIM and FFS	2.2	Number of training sessions conducted Number of staff trained in PRA, PLA, PIM and FFS Number of staff able to conduct PRA, PLA, PIM and FFS activities	Quarterly report, activity report	
2.3	Through participatory process determine preferred crops (food, fruit trees, cash crops & forage) to include in the cropping systems.	2.3	Number of crops identified Mapping of localized preferred crops available	Quarterly report, activity report	
2.4	Undertake local markets survey for farm production based on preferred crops.	2.4	Number of market surveys conducted, market places geo-referenced and database developed	Quarterly report, activity report	
2.5	Together with farming communities in the target area select representative contact farmers.	2.5	Number of representative contact farmers identified and selected Number of farmers trained	Quarterly report, activity report	
2.6	Procure plant materials and other farm inputs for different varieties of preferred crops.	2.6	List of inputs to procure finalized and contracts signed	Quarterly report	

Project Description		Indicators			Source of Verification	Assumptions
2.7	Undertake adaptive test trials for the different varieties of preferred crops.	2.7	Number of trials developed Number of crop selected		Quarterly report	
2.8	Gather relevant agronomic information on preferred crops and develop module based agricultural production training materials and packages.	2.8	Number of technical literature identified and made available to the project		Quarterly report	
2.9	Undertake demonstration and skills training sessions on selected variety of preferred crops based on training materials and packages.	2.9	Number of training sessions conducted Number of farmers involved in training sessions Number of pilot FFS tested/established		Quarterly report	
2.10	Undertake plant material multiplication, selection and treatment for selected variety of preferred crops.	2.10	Number of varieties selected for multiplication Multiplication ratio Quantity of planting material multiplied		Quarterly report	
2.11	Distribute preferred plant materials and train farmers on appropriate cropping systems.	2.11	Number of farmer village groups receiving inputs Quantities distributed		Quarterly report	
2.12	Establish a marketing information system, update the system and disseminate the information on weekly basis.	2.12	Frequency of market information dissemination Number of farmers accessing market information		Quarterly report	
2.13	Together with the selected representative contact farmers prepare and implement production schedules based on different selected crop mixes (cropping patterns) based on soil constraints, water availability, cropping calendar, rotational constraints, crop relative profitability and labour availability.	2.13	Number of markets supplied with agricultural products from project area Incomes generated by farmers		Quarterly report	
2.14	Develop and implement cropping patterns incorporating fodder trees and forage crops that maximize farm incomes and natural resource conservation.	2.14	Incomes generated through fodder and forage crops Health status of livestock Number of trees planted and varieties re-introduced		Quarterly report	

Project Description		Indicators		Source of Verification		Assumptions
3.1	Together with target communities identify relevant service and support organizations including water users, marketing, agricultural advisory services, village development organizations, professional associations and farm input services	3.1	Number of support services and/or organizations identified		Quarterly report	
3.2	Undertake a study of target area community social groups and their interactions.	3.2	Number of social groups identified		Quarterly report	
3.3	Where necessary support establishment of service and support organizations such as village development organizations, farmer organizations among others and support them to provide agricultural advice to farmers.	3.3	Number of village development organizations established		Quarterly report	
3.4	Appraise capacities of service and support organizations and facilitate their capacity improvement.	3.4	Number of identified services and social groups appraised		Quarterly report	
3.5	Facilitate farmer organization or private based marketing of farm produce.	3.5	Number of farmer's organization facilitated in market linkages		Quarterly report	
3.6	Facilitate appropriate skills and knowledge development of relevant service and support organizations including water users, marketing, agricultural advisory services, farm input services and professional associations	3.7	Number of farmer's groups involved in training		Quarterly report	
3.7	Sensitize traders and shopkeepers on appropriate farm inputs.	3.8	Status of linkage between farm input supplier and farm-input consumers (Backward production linkages)		Quarterly report	

APPENDIX5: MAPS OF THE PROJECT INTERVENTION AREA

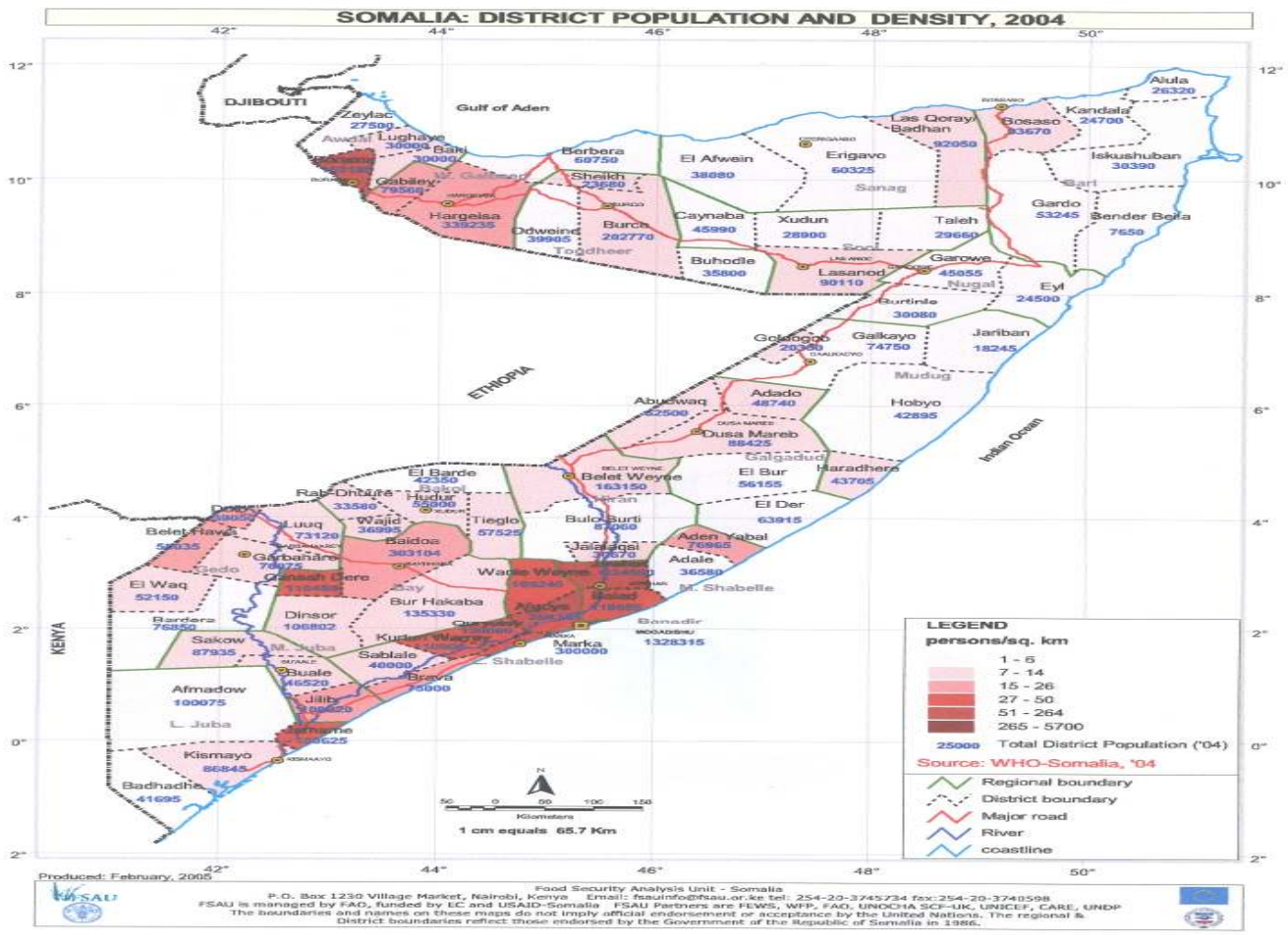


Figure 1: Somalia District Population and Density, 2004

Source: FSAU, 2005



Figure 2: Lower Shabelle CEFA Irrigation Projects

Source: *FSAU, 2005*

APPENDIX 6: LIST OF DOCUMENTS CONSULTED (REFERENCES)

1. **CEFA (no date)** Lower Shabelle Barrage Rehabilitation Feasibility Study

2. **FSAU (2007)** Post *Gu* Analysis. Technical Series Report No. V.13

3. **CTA (1998)** *Reducing Poverty through Agricultural Sector Strategies in Eastern and Southern Africa: Summary Report of a workshop*; Wageningen, the Netherlands

4. **Mckevitt D. and A. Lawton. (eds.) (1994)** *Public sector management*. London: Sage.

5. **Paron, P., Vargas, R. 92007)** Landform of Selected Study Areas in Somaliland and Southern Somalia. Integrated Landform Mapping Approach at semi-detailed scale using Remote Sensing and GIS techniques. FAO-SWALIM. Project Report L-02. Nairobi, Kenya.

6. **SWALIM (2007)** Product Catalogue 2007

7. **Vargas, R.R. and Alim, M.S. (2007)** Soil Survey of the Juba and Shabelle riverine areas in Southern Somalia. FAO-SWALIM. Project Report L-08. Nairobi, Kenya.

APPENDIX 7: LIST OF PERSONS AND INSTITUTIONS MET DURING THE MISSION

Respondent's Name	***Organization/ Responsibility***
Renato Marai	ARDOPIS Coordinator FAO Somalia
Titus Wanjala	Agricultural Field Manager, FAO Somalia
Alberto Rognoni	CEFA, Somalia Coordinator
Yahya Sheikh Abdullahi	CEFA Technical Manager, Somalia
Halawe Abdulkadir Hussein	CEFA Local Engineer, Somalia
Mohamed Ugass Adam	CEFA Administration Finance, Somalia
Bashir Abdi Arush	CEFA Operation Manager, Somalia
Bishar A. Mohamed	CEFA Engineer, Somalia
Ali Adan Ali	Police Commissioner, Lower Shabelle Region
Abdullah Ali Omer	General Secretary, Lower Shabelle Region
Farmer, Bukoro Canal	
Fatuma Omari Yussuf	Chairlady, Simsim Contact Farmers, Vice Chairlady, Bukoro Canal (Buko Village)
Abdi Karim Mohammed	
Market Committee (Bufow Trading Centre)	
Omar Haybe Odowa[20]	
Abuker Yussuf Ahmed	
Abdi Guled Hayle	
Dhagane Mohamed Ibrahim	
Mohamud Mohamed Shuriye	
Bufow Canal Committee	
Farah Adan Mo'allini	
Mohamud Mohamed Dhuhulow	
Mohamed Sufi Abdi	
Muse Ali Abdi	
Ali Dhere	
Subow Guled	
Faadimo Omer	
Hassan M. Celic Hassan Weeynul	
Haaji Hutaanba	
Yelleuhi Gaab	
Maxied Cunar Hecyle	
Cali Seciid	
Jeyhaani Abacusmaay	
Cali Hussein	
Kullow Hussein Aris	
Fornari Canal Committee (Buulo Shek Village	
Mohammed Abdulle	Chairman
Mohamed Aadan Luben	
Hussein Mohamed Cebol	
Sheekh Aaden Mohamed	

[20] Chairman, Bufow Canal Committee

Mohammed Hassan Heymof	
Omer Yaleow	
Mohammed Hassan Sinbaare	
Mohamed Hassan Hooyo	
Madhulow Village	
Hussein Qaesim Burbe	
Shi Yussuf Hassan Drimle	
Caboli D.	
Mohamud C.	
Borrow Ibrahim	
Jecyleem SI. Hussein	
Saaid Yussuf Hassan	
Ibrahim Sheriff M.	
Sheikh M. Hussein	
Bukoro Canal Training at Jerroww Village	
Omar Ibrahim	
Sidow Adulle	
Ahmed Hassan Omer	
Ahmed Mohamud	
Ahmed Nur	
Omar Said Molim	
Mohamed Grad	
Asha Adan	
Barrey Ibrahim	
Adey Abukai	
Binti Ibrahim	
Sahara Abukar	
Faduma Garad	
Safia Noor	
Sid Ali Ibrahim	
Mohamed A.	
Haqi Gaarane Mohamed	
Nuur Omer	
Poim Aliow	
Yaasin Khalif	
Saleed Mohammed	
Mohamed Omer	
Aboli Hashi	
Sh. Nuur Ibrahim	
Hassan H. Siidoow	