

Document of the International Fund for Agricultural Development

State of Eritrea Eastern Lowlands Wadi Development Project Completion Evaluation

> December 2004 Report Nº 1577-ER

Photo on cover page: State of Eritrea <u>Ternafi (farmer leader) in Sheeb</u> Source: Photo by Frank van Steenbergen

### State of Eritrea Eastern Lowlands Wadi Development Project (loan no. 365-ER) Completion Evaluation

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- I. Annex on Spate Irrigation Component
- II. Annex on Domestic Water Supply Component

\* All annexes are available from IFAD's Office of Evaluation (evaluation@ifad.org)

### EXCHANGE RATE

Local Currency	=	Nakfa
USD 1.00	=	13,50 Nakfa

### **ABBREVIATIONS AND ACRONYMS**

Agim	Traditional flood diversion structure
Agnet	Temporary house
AWPB	Annual Work Program and Budget
Baito	Local people's assembly
BEF	Belgian Francs
BSF	Belgian Survival Fund
CAD	Command Area Development
CAHW	Community Animal Health Workers (or paravet)
CWC	Community Water Committees (for drinking water systems)
EA	Extension Agent
ELWDP	Eastern Lowlands Wadi Development Project
GOE	Government of Eritrea
Hh	Households
ICB	International Competitive Bidding
IDA	International Development Agency (World Bank)
IFAD	Internal Fund for Agricultural Development
IMT	Irrigation Management Transfer
Kebabi	Village administration
LCB	Local Competitive Bidding
LPSC	Local Project Steering Committee
MEMWR	Ministry of Energy, Mines and Water Resources (dissolved in 1998)
Mishga	Flood channel
MOA	Ministry of Agriculture
MOC	Ministry of Communication
MOLG	Ministry of Local Government
NFK	Nakfa
OE	Office of Evaluation (IFAD)
Parta	Subcommand area
Tashkil	Leader of tertiary unit
Ternafi	Leader of irrigation subcommand (parta)
SAR	Staff Appraisal Record
SDR	Standard Drawing Rights
Wadi	Ephemeral river
WHO	World Health Organization
WRD	Water Resources Department
USD	United States Dollar
Zoba	Administative unit (district level)





### **State of Eritrea**

### Eastern Lowlands Wadi Development Project

### **Completion Evaluation**

### **Agreement at Completion Point**<sup>1</sup>

### I. Core Learning Partnership and The Users Of The Evaluation

1. The Office of Evaluation (OE) of IFAD conducted a Completion Evaluation of the Eastern Lowlands Wadi Development Project in line with the approach described in 'A Methodological Framework for Project Evaluation' (IFAD 2003). The evaluation mission visited Rome and Eritrea from 24 November to 12 December 2003. In this period among others a workshop was organized with the farmer leaders (*ternafi*) in the project area. The preliminary findings of the evaluation mission were presented and discussed in a stakeholders' workshop at the end of this visit in Asmara, in the presence of the CLP.<sup>2</sup>

2. The draft evaluation report was distributed to the CLP on 2 August 2004 for comments. On the basis of these comments a final draft evaluation report was prepared, including the draft Agreement at Completion Point (ACP). A final evaluation workshop was organized on 5 and 6 October 2004 to discuss the findings and recommendations of this draft ACP. OE participated in the final evaluation workshop to facilitate a full understanding of the evaluation's findings and recommendations as well as the process leading to the final ACP.

3. The participants in the final ACP workshop included representatives of the project implementation agencies, the Sheeb Farmers Association and IFAD.

4. The Agreement at Completion Point (ACP) describes the evaluation partners' understanding of the evaluation recommendations and the actions to adopt and implement them.

### **II.** The Main Evaluation Findings

5. The findings of the Completion Evaluation Mission are set out in the report of August 2004 and the annexes. The objectives and activities of the Eastern Lowlands Wadi Development Project are in line with the policy of the State of Eritrea of promoting spate irrigation and in agreement with the strategic concerns of IFAD as described in the COSOP of 1998.

6. The project was started in 1995. For most of the project period it was implemented under difficult circumstances, in particular the hostilities with Ethiopia that resulted in a de facto suspension of project activities in 1998-1999 and the mobilization, which has made it difficult to operate the project with full staff deployment. The scope of the project originally consisted of the improvement of spate irrigation in two areas in the Eastern Lowlands – Wadi Labka and Sheeb, improved drinking water supply in these two areas, the improvement of agricultural and livestock services and upgrading the access road to the project area.

<sup>&</sup>lt;sup>1</sup> This agreement reflects an understanding among partners to adopt and implement recommendations stemming from the evaluation. The agreement was formulated in consultation with the members of the Core Learning Partnership (CLP).

<sup>&</sup>lt;sup>2</sup> The Core Learning Partnership was composed of Mr. Ibrahim Afrendi, MOA NIR/Sea, Head Office, Massawa; Mr. Heruy Asghedom, Director General, Agricultural Promotion and Development Department, MOA HQ; Mr. Mathew Bingiri, UNICEF – WES Field Officer; Mr. Trhas Bitew, ELWDP – Accountant; Mr. Clement Chibwe, UNICEF – WES Officer; Mr. Kebrom Emun, ELWDP – Extension Agent; Mr. Temesgen Geberzghie, MOA, Sub ZOBA – Head Sheeb; Mr. Kesete Ghiorghi, N.R. Sea, MOA – Land Res. & Crop; Mr. Belay Habtegebriel, Local Process Facilitator, ELWDP – IMT; Mr. Berhane Haile, ELWDP Coordinator; Mr. Debesom Haish, Operation and Maintenance eng. and project Team Leader; Mr. Tesfaldet Mehari, MOA, Procurement and PA Unit – Head; Mr. Mohamed Adem Omer, Sheeb Farmers Association, Treasurer; Mr. Gheberehiwet Teame, Director of Technical Advisor Division, MOA HQ; Mr. Kidane Mariam Teclemariam, Head of Finance Unit, MOA; Mr. Tsgay Teklemariam, ELWDP – CAD; Mr. Mehari Tewolde, Head of Personnel and General Service, MOA; Mr. Bername Tsegai, MADE S.F. Administration, ZOBA, MOA.

7. In the course of the ELWDP the scope of the project had to be reduced. The spate irrigation works in Wadi Labka were dropped, because of budget limitations. The road component was withdrawn from the project and the road was improved to a higher standard than foreseen but at the expense of the budget of the State of Eritrea. After the year 2000 considerable progress was made in ELWDP, particularly in the implementation of the spate irrigation works and in the agriculture and livestock component. From the year 2002 onwards farmers' participation was mainstreamed into the project, through the establishment of the Sheeb Farmer Association and by local coordination through the Local Project Steering Committee, in which project management, local government and farmer leaders equally take part. The SFA constitutes the best warrantee for the long-term viability of the project. All these achievements were made in spite of only having a small project team in place.

8. The project was based on ambitious targets with respect to increased agricultural production. These targets were unrealistically high, even at the onset. The first year of operation of the spate diversion works was disappointing as unusually large floods combined with the late breaking of the breaching bunds caused considerable damage to the downstream area. As a result the 2002/3 crop season by and large failed. The damage was commendably repaired in time for the 2003/4 season. In this season unfortunately the breaching bund in Mai Ule broke twice, resulting in low crop yields in this part of the Sheeb system. The Wadi Laba command area witnessed a very good crop, which farmers attribute to the favourable flood season. Farmers are generally appreciative of the works in Wadi Laba, and see a major benefit in the reduced maintenance burden. The construction of the traditional brushwood structures was becoming increasingly difficult and non-sustainable in the long run, due to the shortage of acacia trees and the project has thus safeguarded spate irrigation-based agriculture in Wadi Laba. Similarly, the command area subcomponent, which started alongside the Irrigation Management Transfer component in 2001, is appreciated by the farmers in Sheeb.

9. The agricultural and livestock component has been popular with farmers, in particular the agricultural trainings – for which there is a large demand - and the services of the paravets. Also two new sorghum varieties were developed under this component. One bottleneck in Sheeb remains the availability of draught animals, essential for land preparation and soil moisture conservation. The program of restocking livestock in the area was in place in the early part of the project, but was discontinued in the later stage.

10. The drinking water component did not come off the ground so far. Preparatory studies and designs were undertaken and material for a drinking water scheme in the main settlement of Men'sheeb was procured. The implementation of this drinking water scheme had to be abandoned, because the source that was identified turned out to be unreliable. The drinking water component was subsequently funded by Cooperazione Italiana. The fate of the drinking water component remained uncertain for a long time, as no nitrate-free source could be found. It is understood however that recently safe drinking water sources have been identified.

11. In summary, at the time of the evaluation the impact of the ELWDP is modest. Compared to the targets in the Staff Appraisal Report, the drinking water component and road component as well as the spate irrigation component in Wadi Labka could not be implemented under the project. Important challenges remain in the effective operation of the spate infrastructure in Sheeb. This does not remove the fact that in the last four years substantial progress has been made, as described above. The high level of dedication of the MoA team goes a long way to explain these achievements and the performance of the MoA is rated as substantial.

### III. Agreed Points

12. The agreed points concern both follow-up actions and policy issues. In several respects the Eastern Lowlands Wadi Development Project was a 'first'. It was the first IFAD/BSF-supported project in Eritrea, identified just after the new country emerged from a long conflict. It was the first significant investment in civil works for spate irrigation in the country. It was also one of the earlier projects in the IFAD-BSF Joint Program. Summarized below are the immediate follow up actions to be taken to ensure the proper and safe completion of ELWDP as well as the policy lessons to be learned.

13. The major recommendation is that there should be an extension of ELDWP activities until 31 March 2006, given the need to consolidate investments and ensure the successful and safe completion and sustainability of the project. The extension will allow that the lessons learned and the recommendations, described below, to be applied.

14. The recommendations are arranged in two principal categories: (i) follow up activities and (ii) policy directions. Within the category of follow up activities a number of themes are listed: (1) extension until mid-2006; (2) improve financial analysis; (3) support to the Sheeb Farmers' Association; (4) resolve operational problems in the spate system; (5) continue the agricultural component; (6) sustain the paravet program; (7) capacity building and (8) finalize the drinking water component. Within the category of policy directions the following themes are listed: (1) operating projects in conflict and post conflict situations; (2) monitoring and management to steer outputs; (3) revisit and broaden the approach to spate irrigation development; (4) systematically engage farmer organizations from the onset of the project; and (5) interagency collaboration.

### **IV.** Follow up activities

### Theme 1: Extension until mid-2006

15. An extension of ELWDP activities until 31 March 2006 is required to ensure the successful and safe completion and sustainability of the project. Project implementation accelerated from 2000 onwards and several important activities in agricultural training, livestock services and irrigation management transfer have started, that need to be consolidated. Furthermore, the current operation of the system – in particular the breaching bunds – entails a risk, that should be resolved in the extension period.

16. An extension up to 31 March 2006 is necessary, because due to the inclement weather in Sheeb project activities only take place during the October-April interval. Activities in the extension period should be in support of the Sheeb Farmers Association, improving technical operations and strengthen the support to the agricultural component and the paravet program. An extension may also be used to monitor project impact over a longer period and summarize lessons learned and may contribute to a spate irrigation development strategy in Eritrea.

Follow up: Ministry of Agriculture, IFAD and BSF agree on extension up to March 2006, based on the program of activities and budget, prepared to MoA.

### Theme 2: Improved financial reporting

17. At the time of the evaluation the financial administration of ELWDP did not allow for an overview of the budget reallocations between components and categories or a comparison of financial disbursement with initial financial targets. This made it difficult for the evaluation mission to assess cost effectiveness. It is understood, however, that recently the financial administration of the project has been digitized and that the current system allows an analysis of project expenditure on activity-basis for the disbursement post-2000. It is proposed to improve the financial reporting on ELWDP to include sub-component analysis also, making use of these new opportunities.

Follow up: Ministry of Agriculture, cooperating institution and IFAD to review the financial reporting, that goes with the progress reports in view of the opportunities provided by the new financial system.

### Theme 3: Support to Sheeb Farmers Association

18. The third follow up action is to build on the now well-structured participatory process and extend support to the Sheeb Farmer Association. It is understood that after the evaluation mission the constitution of the Sheeb Farmers Association was ratified and that the Sheeb Farmers Association is in place with 3000 members. The following needs to be achieved up to 2006: discussion and training of farmers in the operation of the system, especially the breaching bund and the gravel trap, management of earth moving equipment, needs assessments and capacity building in priority areas – especially among members of the Executive Committee - including crucial tasks such as financial

administration and collection of fees, and planning in order to bring about improvements in the command area – including improvements in the system of water distribution.

Follow up: Detailed program of support to the Sheeb Farmers Association on the topics mentioned above to be finalized and agreed upon by MoA, SFA and IFAD.

### Theme 4: Resolve operational problems in the spate system

19. It is agreed to undertake a technical audit to evaluate in a holistic manner the operation of the Wadi Laba and Mai Ule systems. This technical audit is to be performed by an external expert in close collaboration with representatives of the Sheeb Farmers Association and the MoA. The collaboration with farmers' representatives is important to maintain farmers' confidence and feeling of ownership. The collaboration with the MoA field staff will be an important opportunity for capacity building among field staff.

20. In the remit of the audit the operation of the breaching bunds and diversion gates and the gravel trap and syphon will have a central place. There are questions as to whether the bunds in the current designs can handle the flood peaks – particularly in Mai Ule. On the other hand the risk is that farmers may want to raise the bunds, which can cause the bunds to breach too late – resulting in a disastrous flood surge. The same can happen if the bunds settle over time, making them more compact and stronger. MoA and Sheeb Farmers Association with the help of external expert support will review the operation of the breaching bunds, including feasibility of forced breaching. In the review the best operation of the sediment trap now mainly intercepts fine sediment, unlike what was assumed at design. This affects the operation of the bulldozer and also asks question on the necessity of cleaning the gravel trap. The functioning of the culvert is also closely to the performance of the gravel trap. The technical audit will also be used to review the 1995 and 1998 design parameters, in order that lessons may be learned on several aspects, including the sizing of the headworks. The audit should also look at a program for regular hydrological monitoring.

Follow up: Technical audit to be organized by MoA/IFAD. The technical audit will be a joint exercise with farmers' representatives and the project field officers so as to share knowledge and build capacity.

### Theme 5: Continue agricultural component

21. For a long time the agricultural component was devoted to the development of new sorghum varieties. While this in itself has been useful, it is also important to continue the recently intensified collaboration between contact farmers, extensionists and researchers, particularly as there is a well-established practice of dissemination of extension messages by communities within communities. In the needs assessment several promising new fields have been identified such as ground water-based horticulture and forage and feed production (drought resistant grasses and fast growing species and cultivars of fodder plants). Diversification into high value commercial crops, for example vegetables, watermelons and chillies, may also hold potential and should be included in the research program as well. It is understood that since the fielding of the evaluation mission MoA, IFAD and the cooporating institution agreed to continue the extension program in this direction – making a larger effort to engage female farmers, continue to involve contact farmers, and to strengthen the linkages between extension, research and farmers.

Follow up: Agricultural component to be extended by MoA and to include the elements described above (new techniques, training female farmers and engagement of contact farmers), supported with training to agricultural extension staff.

### Theme 6: Sustain paravet program

22. The paravet/community animal health workers program has been well-received and appears to fulfill an important need. It is important that the paravet services continue, after completion of ELWDP. It is agreed to undertake a detailed assassment of the paravet program (looking into among others changes in rates of disease incidence and productivity; the drug supply system and the financial

sustainability) and the way to which the paravets should be linked to the MoA program in animal health and livestock extension. Some of the data that are regularly collected may be of important use in this respect. The study is expected to provide an input to the policies of the MoA in this field and give guidance as to the possible replication of the programme elsewhere in Eritrea.

Follow up: MoA to initiate a technical study of the paravet program, if required with support of IFAD.

### Theme 7: Undertake capacity building

23. One of the two stated objectives of ELWDP was to strengthen the enduring capacity of the MoA to support the development of spate irrigation in the country. For a number of reasons – mainly related to mobilization - this activity did not come of the ground. Though the MoA staff working in spate irrigation is highly motivated, gaps in their knowledge remain. Besides, the total number of professional staff engaged in this activity remains very small. Another important constraint is the severe lack of basic hydrological data to support the planning of spate irrigation systems. It is agreed to develop a capacity building plan, identifying training needs among existing staff and assessing total staff strength required as well as responsibilities in the various parts of the MoA. The plan should also describe the most practical arrangements for building up the capacity, either in-country or abroad. The development of this capacity building plan is closely related to the lessons learned document described under theme 3.

Follow up: MoA to initiate a capacity building plan and identify resources with the aid of IFAD and BSF.

### Theme 8: Finalize drinking water component

24. Finally, it is agreed – in spite of the unsatisfactory achievements in ELWDP in this field – that the drinking water component needs to be completed in an appropriate manner, not the least because this is a high priority in the area. Funding for the investments will come from the Cooperazione Italiana/ UNICEF program. It is understood that recently a water quality survey was undertaken in the project area, that for the first time identified safe (nitrate-free) sources of drinking water. It is agreed that UNICEF will complete drinking water supply systems in Men'sheeb, Bises, Tiluk and Genab by mid-April 2005. In doing so UNICEF/ MoLG will make use of the still unutilized material of the 2000 procurement. The material that cannot be used in the project area will be used elsewhere in the country on an exchange basis.

Follow up: UNICEF to complete drinking water systems in the project area by April 2005.

### V. Recommendations for Policy Directions

### Theme 1: Operating projects in conflict and post conflict situations

25. ELWDP has been implemented in a period of conflict and post conflict in the country. Given these circumstances the actual achievements by the MoA are commendable. The conflict with Ethiopia resulted in loss of time and in discontinuity. It also caused capacity problems within the implementing organisations, because much staff was under mobilisation for large part of the project period.

26. Because of the associated uncertainties of a post-conflict situation the SAR already advocated a 'simple' approach. Experience of ELWDP reinforces that simplicity and clarity of implementation arrangements are crucial to project achievement in such circumstances. A second lesson is the importance of activities that quickly rectify immediate resource constraints in post-conflict situations – such as the supply of draught animals or bulldozers for earth works. A third lesson is to acknowledge the capacity problems that may arise in conflict and post-conflict situations and have the flexibility to reassess arrangements for project implementation.

Follow up: BSF and IFAD to incorporate these lessons in ongoing policy work on operating in post conflict situations.

### Theme 2: Monitoring and management to steer outputs

27. In ELWDP at an early stage, the decision was made to set up the financial administration on the basis of spending categories rather than project outputs and project components. This has made it difficult to track and compare expenditures in each project component. In spite of several attempts, no monitoring system was established or baseline prepared, which has been it difficult to assess the performance in each component and determine their cost effectiveness. This hampers decision making processes on project priorities. It is recommended that in future projects result-based monitoring and activity-based budgeting procedures are put in place at a very early stage.

28. It is strongly suggested that setting up such financial systems and monitoring and feedback mechanisms be the joint responsibility of the implementing government and the project financer, not of the implementing government only. The project financer by virtue of its broader experience in this field should, if required, take the lead in investing in these systems and in the human resource development that goes with it.

Follow up: When implementing the Results and Impact Management System (RIMS), IFAD should provide upfront support to implementing agencies in monitoring and financial management across its projects, including capacity building.

### Theme 3: Revisit and broaden the approach to spate irrigation development

29. The civil engineering approach in ELWDP followed what during the identification of the project was considered to be good practice in spate irrigation development. This approach comes however at relatively high investment costs per hectare and some of the design features bring along their own operational risk. As spate irrigation is considered a main area for improved food security in Eritrea, it is agreed that in addition to the civil engineering approach, followed in ELWDP, a broad range of approaches and options is considered in improving and developing spate irrigation. Such other approaches for spate irrigation improvement in Eritrea may include the provision of bulldozers on paid or even commercial rates, the improvement in command areas networks and water distribution strategies, the development of relatively cheaper spate systems on smaller rivers, the use of low-cost technology to strengthen traditional diversions, the introduction of improved draught animals, and the development of high value cropping patterns.

30. It is agreed that the cost, benefits and longevity of each of these interventions varies and should be documented, on the basis of experience in Eritrea and elsewhere. Each area may have its own set of suitable measures. An inventory of what combination of measures is most appropriate in each area should be prepared. Such an inventory should also look at arrangements for identification (given the general absence of data) and implementation (including role of farmer associations and sub-zoba government).

Follow up: MoA and project partners to prepare a lessons learned document on spate irrigation development along the lines above and ensure adequate dissemination and discussion, for instance through workshops.

### Theme 4: Systematically engage farmer organizations from the onset of the project

31. In ELWDP some farmer discussion took place during the design stage, but it was not done through a formal process. One lesson for farmer participation to be effective is to give it a central place from the beginning in the implementation of projects such as ELWDP. This should be done in a systematic manner through establishing a farmers association at an early stage (with due respect for the traditional organisation in this field) and through formal and structured consultation, leading to mutual agreements on designs and responsibilities.

Follow up: Ministry of Agriculture, World Bank and IFAD to integrate this lesson in ongoing programmes, if not done so already.

### Theme 5: Interagency collaboration

32. The one component in ELWDP that did not yield result – in spite of the high need for it - was the drinking water component. This component was implemented by UNICEF, which was given full responsibility for it in the concerned Memorandum of Understanding between UNICEF and IFAD. The background was the limited capacity within Eritrea to plan and implement drinking water systems. The arrangements in the Memorandum caused a conflict of functions, however, with UNICEF being responsible for design, implementation, supervision and monitoring. When the drinking water component started to fail, moreover, there was hardly the possibility to correct the cause of events. The lesson learned here is to separate implementation and supervision functions and clarify responsibilities. Agreements between agencies should include provisions to take corrective action, if things do not evolve as planned. A second lesson is that the Government was not party to the Memorandum of Understanding, which in the future should be avoided. The role of the government agencies involved in implementation should also be clarified.

*Follow up: IFAD and BSF to review their collaborative arrangements with other partners – including UN agencies – in order to detail responsibilities explicitly.* 

### VI. Recommendations discussed but without a firm conclusion

33. One of the recommendations with respect to the agricultural program was to promote the use of low-cost tube wells for cash crops in the project area. Though there was no disagreement on the relevance of this recommendation, the MoA indicated that given the time left in the project, this recommendation can not be incorporated in the project program.

### **State of Eritrea**

### Eastern Lowlands Wadi Development Project

### **Completion Evaluation**

### **Executive Summary**

### I. INTRODUCTION

1. The Mission was mounted to assess the performance and impact of the project (ELDWP). The evaluation followed the guidelines and criteria of the IFAD Methodological Framework for Project Evaluation, with its emphasis on: **rural poverty impact** at household and community level, the **performance of the project** and the **performance of partners** in implementation and its principal concern with the four key measures of: **relevance** of objectives, **effectiveness** of their achievement, **efficiency** in use of funds and resources and **sustainability** of outcomes and impact.

2. The mission started in Rome, where briefings were given at IFAD headquarters by the Director of the Eastern and Southern Africa Division, a Senior Evaluation Officer, the Country Program Manager as well as BSF Program Manager and Assistant Program Manager. It then left for Asmara, where a discussion was organized under the chairmanship of the acting Minister of Agriculture. Several other interviews were held in Asmara including the MOA staff – in particular the Project Coordinator, the Procurement and Accounting Officers, staff of World Bank, UNICEF, Ministry of Local Government (MOLG), Water Resources Department (WRD), Cooperazione Italiana, the University of Asmara team responsible for the Socio-Economic Baseline Study as well as and several NGOs operating in water supply and food aid.

3. The evaluation was undertaken in the absence of consolidated baseline or impact data. The evaluation therefore relied relatively heavily on first hand fact finding in the field, which was triangulated by source and by method. Triangulation by source included informal interviews with the staff of the MOA field unit, the local administration, the school principal, the Mensheeb health clinic and the Eritrean Relief and Refugee Commission (ERREC), as well as study of project reports and data compilations made available to the mission by the interviewed. Triangulation by method included participatory learning and action techniques, in particular joint transect walks, focus group interviews and a stakeholders workshop.

4. The preliminary findings of the evaluation were presented and discussed in a debriefing workshop in Asmara, immediately after the field work.

### II. MAIN DESIGN FEATURES

5. **Project Rationale and Strategy.** The Eastern Wadi Lowlands Development Project (EWLDP) started in 1995 with the aim of improving spate irrigation-based agricultural systems to enable a major expansion of smallholder production of basic staples and strengthening the capacity of the Ministry of Agriculture to plan and implement similar activities<sup>2</sup>. This was done in the context of addressing the lack of food security in the area. The development of spate irrigation was and continues to be seen as the main avenue to increase crop production in Eritrea.

6. Though spate irrigation was the main focus of the project, several other components were included: agriculture and livestock development, provision of drinking water, project management, and improvement of the access road. Total project costs were USD 20,1 million, of which the International Fund for Agricultural Development (IFAD) provided a loan of USD 12,6 million and the

<sup>&</sup>lt;sup>1</sup> The Mission was composed of Mr. Frank van Steenbergen, Mission Leader and Spate Irrigation Expert; Ms. Lea Joensen, Agricultural and Extension Expert; Ms. Ximena Traa, Anthropologist and Gender Expert; Mr. Nicolaas Hoorweg, Domestic Water Supply and Mr. Michel van de Heyden, as Observer from ISSF, accompanied the mission. The Mission was assisted by local translators.

 $<sup>^{2}</sup>$  In spate irrigation episodic floods are diverted from river beds to irrigate agricultural land prior to sowing. It is a precarious form of water management as diversion structures may not stand up to the floods and sediment deposition can be substantial.

Belgian Survival Fund (BSF) a grant of USD 5,2 million. USD 1,3 million was to be contributed by the Government of Eritrea (GOE) and USD 835 000 by beneficiaries. This budget was allocated to the different components as follows: spate irrigation (66%), agricultural and livestock (12%), roads (10%), domestic water supply (7%) and coordination (5%). The BSF contribution was made available in two different grants. The first grant was earmarked for domestic water supply, whereas the second grant was dedicated to road, agricultural and livestock components

7. **Project Area and Target Group.** ELWDP was planned to cover two well-established agricultural areas in the Eastern Lowlands – Sheeb, with a population of 22,500 and a command area of 3650 ha, and Wadi Labka, with a population of 13,500 and a command area of 2400 ha.. The livelihood system in these areas is agro-pastoralist and semi-nomadic. The project's primary target group comprised the land users in the command area; the secondary target group comprised the general population of the area that would benefit from an increased level of services, additional employment opportunities and increased food security.

8. **Implementation Partners and Arrangements.** For all components of ELWDP, except the drinking water and the road component, coordination would rest with the MOA. The roads component would be implemented by the Ministry of Communication (MOC), and coordinated by the Ministry of Agriculture. The drinking water component, funded under the separate BSF-grant, was to be implemented by UNICEF "in collaboration" with the Ministry of Energy, Mines and Water Resources, in particular the Water Resources Department (WRD). A separate agreement to this effect was signed between the UNICEF Headquarters and IFAD.

9. The project was due to be completed in December 2000, but because of the Eritrean-Ethiopian War and the time required for local institutional development, the ELWDP closure date was extended first to December 2002 and then to December 2004. The International Development Agency (IDA) supervised the project with the exception of the drinking water supply component, which was implemented and supervised by UNICEF. A Project Steering Committee (PSC) would bring together the heads of all participating departments of MOA under the chairmanship of the Director, Planning and Programs Department. The provincial administrators and representatives of MOA would also be members. Day-to-day management would be in the hands of a designated program manager, who would be assisted by a socio-economist and an accounts clerk. In Sheeb, where there were hardly any permanent facilities at the start of ELWDP, an on-site project office would be built.

10. **Major Changes in Policy and Institutions during Implementation.** Several important changes in the institutional arrangements were undertaken mostly reflecting a much greater use of private sector services than originally anticipated; this was to a large extent a response to capacity constraints within the implementing government agencies.

11. To improve local coordination a Local Project Steering Committee (LPSC) was formed in 2001. Apart from the project coordinator and the local project staff, this committee consists of representatives of the zonal and sub-zonal administration of the MOA, and representatives of the village administrations.

12. From 2002 onwards systematic preparations have been made for the Sheeb Farmers' Association. Its structures and rules, described in the draft Constitution, are based on extensive farmer participation. Though large informal farmer organizations exist in spate systems in various countries, the Sheeb Association will be the firrst farmer organization running an entire modernized system.

13. On the drinking water front there were several changes in the mandates between 1996-1998. Implementation activities were removed from WRD and were supposed to be placed with a new parastatal, the Eritrean Well Drilling Company. Subsequently the role of the Ministry of Local Government (MOLG) expanded; it was made responsible for supervising the works, as it was to finally own the infrastructure.

14. **Design changes during implementation.** Most changes were formalized after the project restarted in 2000, following the end of the open hostilities between Eritrea and Ethiopia. The main changes were the cancellation of the spate diversion component for Wadi Labka and the removal of

the road component from the ELWDP budget. Two new subcomponents were added: the Command Area Development (CAD) subcomponent and the Irrigation Management Transfer (IMT) component.

### III. SUMMARY OF IMPLEMENTATION RESULTS

15. <u>Spate Irrigation:</u> in physical terms, the project objective of constructing civil works at Wadi Laba, Mai Ule and Wadi Labka serving an estimated area of 4670 ha was not fully achieved as only the civil works at Wadi Laba and Mai Ule serving an area of 3650 ha. were constructed. Major changes to the original designs and the fact that the Wadi Laba and Mai Ule works were tendered under ICB instead of force account inflated costs, and in the end, the Wadi Labka design was prepared but not implemented due to budget constraints. The civil works were completed in 2002. In August of that year a massive flood occurred in both wadis, causing major damage, and a crash emergency repair program was undertaken.

16. <u>Command Area Development (CAD)</u>: after the headworks for Wadi Labka were cancelled, some of the financial resources freed were routed to the command area works. So far three structures have been completed using this formula and 11 more are planned for the coming season in seven locations. The CAD program had to overcome considerable disillusionment among the farmers, because of the 2002 flood damage. Prior to agreement and construction in the CAD program there is now extensive discussion and consultation, using the traditional *ternafi* leadership. This process was uniformily appreciated among the farmers. An innovative division structure was designed for Sheeb Kateen, which is a good example of cross-fertilization of 'indigenous knowledge' and 'modern technology'.

17. <u>Irrigation Management Transfer (IMT)</u>: In spite of the recognized need for farmer management in the SAR, no specific plan of strengthening the farmer organization in ELWDP was included in the project design. It was only in 2002 that IMT took off when inputs by an international consultant and the local facilitor appointed in early 2003 have put this component on track. A start was made with the development of the apex Sheeb Farmers Association, that took over system management. The Farmers' Association is being grafted on the traditional organization in spate management. Though much ground has been covered, developing capacities to manage the structures in such areas as book keeping, work planning and system operation may still be a time-consuming process.

18. <u>The Agriculture and Livestock Development Component</u> was by and large implemented as planned and, despite its low profile, has a number of positive achievements to its credit. Under the adoptive research program two new sorghum varieties were released. Several farmers took advantage of the training programs provided by the extension department and trained farmers passed the learning on to others. The new "contact farmers" approach, though not yet fully implemented, opens up the possibility of closer contact between researchers and extension workers, and collaborative experimentation on local priorities, the effects of which remains to be seen. The services of the community animal health workers trained under ELWDP have become very popular. They account for a large coverage in vaccinations and have brought animal health control to the farmers' doorstep. It is unfortunate that the distribution of oxen on credit did not continue, because the impact of livestock ownership on farm productivy is very significant.

19. <u>Drinking water component</u>. Feasibility studies, several changes in the design and UNICEF's erroneous assumption that total procurement costs would be low and would leave enough of a budget balance for the supplies for the Mensheeb system, led to near budget exhaustion in 2000. The materiel was stored in the market building of Mensheeb, and it still remains there. Apart from the feasibility study and the procurement, UNICEF/WRD had also fielded two community organisers who had to break the ground for community management and create awareness on clean drinking water and appropriate sanitation. In the absence of effective implementation these efforts turned out to be premature. Cooperatizione Italiana agreed to take over the component. The Mensheeb drinking water supply system however could not be built when it turned out that the source in the Wadi Laba gorge was not perennial.

20. <u>Road component.</u> Very early on in the project it was discovered that the financial outlay was a gross underestimation. Instead, the GOE financed and implemented a higher grade road. The BSF grant for this component was reallocated to complete the civil works in the spate component.

### IV. PERFORMANCE OF THE PROJECT

21. **Relevance of Objectives.** The objectives of ELDWP are in line with the COSOP, and remain relevant today. Spate irrigation is still seen as one of the main avenues to increasing crop production in Eritrea, and this, given the scale of imported food aid, is particularly important. The objective of capacity building remains equally relevant, since the GOE continues to have plans to expand the area under spate irrigation.

22. **Effectiveness**. ELWDP constructed only one out of two designated spate irrigation systems. The drinking water component did not come off the ground. The link road was constructed – but largely funded from outside ELWDP. The agricultural and livestock component was by and large implemented as envisaged.

23. The extent to which ELWDP was effective in expanding smallholder production of basic staples is difficult to measure. Variability in crop production is inherent to spate irrigation, because of the different flood patterns. Insofar as can be assessed after two years of operation and in the absence of baseline data, food crop production has not yet increased significantly. In Wadi Laba 2003/4 was a bumper year, but universally farmers ascribed this to the good floods and not to the new ability to divert them. Farmers identified the reduced maintenance burden – which was in peril, because acacia trees have disappeared from the vicinity – as the main benefit of the spate component. The perception in Mai Ule is still negative, as the 2003-04 season failed after the breaching bund broke twice.

24. The effectiveness of the other ELWDP activities to increase crop production is more difficult to establish, as it is difficult to attribute change to the concerned project components. The upgraded extension services and new sorghum varieties have been in place only recently, and it is too early to establish adoption rates.

25. Capacity building of the MOA was the second objective of the project. This never received systematic attention and during design and construction opportunities were missed in knowledge transfer and building up skills. A main constraint was the difficulty of making adequate MOA staff available, because of the mobilization.

26. **Efficiency**. The route taken under ELDWP in spate irrigation improvement was comparatively costly. And given the lower reliability of irrigation in Mai Ule, this system no longer met the criteria of reasonable economic feasibility. The same can be said for the drinking water component which had high investment costs per capita as compared to world average costs for similar rural water supply interventions. Unfortunately, the draught animal supply component – in spite of its low cost and potential high cost efficiency –was not continued.

### V. IMPACT ON RURAL POVERTY

27. **Impact on Physical and Financial Assets.** In comparison with the traditional system of spate irrigation the new diversion structures allow better control of water within the command area. The impact of this improved control on land productivity varies across the different parts of the command area. Some are better off than before, others worse, mainly because the Mai Ule headworks do not function according to plan.

28. The productivity of livestock has increased due to the CAHW programme, which is effective in improving the health of livestock, and more remote villages now have access to basic animal health services. The impact on livestock productivity of the CAHW programme is however unquantifiable, as the drought of the last three years has offset livestock productivity considerably. The project has had no impact on absolute livestock numbers, because the oxen distribution programme was discontinued. The importance of these draught animals is significant, because field bunding and ploughing greatly facilitate soil moisture conservation and can increase crop production by at least

30%. Overall, the impact of the project on physical and financial assets is ranked as modest to subtantial (2-3).

29. **Impact on Human Assets.** The most important impact on human assets concerns the increase in agricultural knowledge as a result of the agricultural and livestock development program. The extension program has fulfilled a definite need. The impact on human assets of the new main road – which was in the end not funded through ELWDP – and the local dirt roads (made to facilitate construction of the spate workds) has been considerable inasmuch as a positive general trend in school enrollment has taken place. Also travel time to major cities has been reduced, and farmers have improved access to clinics elsewhere, access to boarding schools; access to markets to buy and sell products, and to financial institutions in the cities. Project contribution to increases in human assets is classified as modest to substantial (2-3).

30. **Impact on social capital and empowerment**. In the project area there is considerable social capital in the shape of a well-arranged informal farmers organization that is now being formalized. However, further training is needed for farmers to reach the level of social capital and empowerment needed to administer the project (collect fees, contract services, pay workers, pay O&M costs), enforce water irrigation rights, and manage the project headworks and command area structures. Because there remains a gap between what is possible and desirable from a development viewpoint in terms of community self-reliance and involvement and what has been attained up till now, the project impact on social capital and empowerment is ranked as modest (2).

31. **Impact on Food Security.** Though it is still early days, the impact on food security from the spate diversion– positive or negative - so far seems modest. There is no indication that a '<u>major</u>' expansion of smallholder production of basic staples' has occurred yet. According to the medical staff in the Mensheeb Clinic, dietary habits have not improved in the past five years. However, some of the activities in the extension programme – such as the introduction of improved sorghum varieties to 118 farmers this year – hold promise for future expansion of crop production, given that the increased productivity of the new sorghum varieties as experienced under trials can be replicated in farmers' fields and that the varieties are broadly adopted. Also, diversification into high value commercial crops including for example vegetables may hold potential. For the time being, the project impact on food security is therefore ranked as negligible (1), but potential for future improvement is present.

32. **Impact on the Environment and Communal Resource Base.** The main impact on the environment relates to the project having reversed the decrease of tree cover in the area. The construction of the permanent spate headworks has reduced the requirement of trees used to build the traditional diversion structures. Another impact mentioned by farmers was that they believe that nutrient requirements of their crops are no longer sufficiently satisfied by the floods, because of loss of sediments and organic nutrients caught in the gravel trap. This issue should be monitored and discussed with farmers. Regrettably, the project has not had any impact on improving the quality of drinking water. The current high nitrate content is harmful to young children and can lead to cyanosis. The contribution of the project to improvement of the environment and communal resource base is ranked as modest to substantial (2-3).

33. **Impact on Institutions, Policies and the Regulatory Framework.** Preparations have been made for the Sheeb Farmers' Association and its structure and rules, described in the draft Constitution (in particular the water charge) and have been discussed extensively. Once in place the Association may expand its activities to input supply and water distribution in the command area. It is recognized that future impact may well qualify for a higher rating, as these processes, even though late in being launched, are well structured and local ownership is high. Impact on regulatory frameworks was not an objective of the project and cannot be assessed. The project was meant to be a pilot and as such holds the potential of influencing spate policy dialogue in the future. The impact of the project on this domain as of now is classified as modest (2).

34. **Impact on Gender.** No gender strategy was part of the project design and opportunities to increase project impact and to balance gender relations have been missed. In spite of widespread illiteracy, women are avid for training in home economics and handicrafts and they were in general satisfied with the trainings received on these issues. Although female farmers carry out a significant

part of agricultural activities, only one special training session for women was arranged by the agricultural extension services and led to many requests for more. The one component that could have made a significant difference to women, the drinking water component, did not come off the ground. Project contribution to impact on gender equality and women's empowerment is therefore considered modest (2).

35. **Sustainability.** Before the project, the availability of trees for traditional diversion structures had become precarious and in bad years the practice of selling draught animals and other livestock was a common coping strategy, which reduced the capacity to restore the traditional diversion structures. By constructing permanent diversion structures these vulnerabilities and threats have reduced significantly. The question remains however whether the capacity of the communities, particularly the Sheeb Farmers' Association, to maintain the diversion structures is sufficient. Substantial social capital seems to be in place, but further training is needed for farmers to administer the project on their own. Overall, the sustainability of the project is classified as substantial (3).

36. **Innovation and replicability/scaling up.** At this point in time, it may be too early to judge whether the engineering works are likely to be replicated on a large scale. In general, the evaluation recognizes the potential for spate irrigation in Eritrea as an appropriate strategy for water resource development. A main lesson from ELDWP is that attention should also be given to low cost approaches, do-able maintenance and to linking investment with likelihood of irrigation and realistic impact. Not every approach is suitable everywhere, but there is a large number of measures (including the promotion of new crops, livestock support, soil bunding) that can increase the productivity of spate irrigation in Eritrea.

37. Several elements of ELWDP classify as innovations worthy of replication, both in the country and elsewhere – in particular the farmer-government interaction through the local steering committee, the farmer-management of a spate system of this size, the paravet program and some of the elements of the command area works. The MOA has already capitalized on this and is organizing farmer-to-farmer visits, taking farmers from new spate areas in the Western Lowlands to Sheeb. The rating for innovation and potential scope for replication of some project approaches and activities is substantial (3).

38. **Other poverty impact.** The investment in the ELWDP and the construction of the road created job opportunities in construction and in the local service sector. The activities started under ELWDP have also created a number of new job opportunities – such as the paravets and some of the locally trained maintenance staff. The rating for project impact on job opportunities is classified as substantial (3).

39. **Overall impact assessment.** Impact of ELWDP on poverty alleviation is mixed – with both positive and negative elements. The current infrastructure has relieved the threat of the system collapsing because of the non-availability of suitable brushwood. The current design however depends on breaching bunds, which as yet do not function well and may cause either loss of flood water or the release of flood surges. Also, land productivity varies across the different parts of the command area, with some better off than before, others worse. The activities in the agricultural program have had positive results on the health of livestock (a very critical household asset) and on farming practices. However, considerable impact could have been achieved with the oxen distribution programme, which was discontinued. There was no impact on improving the quality of drinking water and very limited impact on gender. The potential for impact on the social capital and empowerment seems promising with the development of the farmers' association, but continued support will be needed.

40. The impact of the spate improvement on crop production or food security is as yet not visible. It must be emphasized that the impact assessment is based on only two years of full operation and that the potential for the future impact on crop production may be higher than what is currently visible. The new improved sorghum varieties have potential for production increases. Also, diversification into high value commercial crops including for example vegetables and cotton may hold potential. The future impacts will however depend on a successful implementation of the activities

recommended for the follow-on phase of the project. The overall impact of the project is thus ranked as modest (2) at present, but with potential to become substantial.

### VI. PERFORMANCE OF PARTNERS

41. **Performance of IFAD.** IFAD must be commended for its initiative to place greater emphasis on the IMT and Crop and Livestock Components after 2001 by fielding consultants from its trust funds to formulate programs in this area. However, there are three weak areas in IFAD's performance. The first is the availability of basic financial data and the lack of data on project impact. This is a shortcoming for which all three partners share responsibility —IFAD, the MOA and IDA, even though formally this is the task of the recipient organization. The second weak area in IFAD's performance is the problematic relation with UNICEF. The MoU with UNICEF was rather loose, only obliging UNICEF to carry out the agreed activities with due diligence and efficiency and without provision for supervision by IFAD. IFAD's attempts to guide UNICEF did not have any effect. This area of weakness concerns problematic interagency relations and not the individual performance of operational staff. The third weak area concerns too optimistic assumptions in the design on government capacity to implement and on likely project impact. The overall rating is (2-3).

42. **Performance of Co-operating Institution.** As far as can be judged procurement in the components supervised by IDA was handled smoothly and the professional composition of supervision teams have been adequate. IDA supervision must be commended for at an early stage to push the issue of engaging an international engineering firm to prepare the designs. Also, the re-orientation of the project after the project was restarted in 2000 to put emphasis on encouraging farmers' involvement in the command area works, creating an effective farmers association, and regaining trust in the aftermath of the 2002 flood can in part be attributed to IDA supervisions. Supervision reports were timely and of high quality and follow-up on previous recommendations satisfactory. The overall rating is therefore (3).

43. **Performance of Government and Its Agencies (including project management).** Throughout the project the GOE suffered from the inability to make sufficient staff available. Even so, the components that were agreed after the budget reallocations have all been by and large been implemented, most of it in the period 2000-2004. Given the limited human resources, this is a considerable achievement. What never took off, however, is the monitoring of the project impact. Similarly, the financial administration remained problematic until very recently. Monitoring in the drinking water sector is equally weak. First WRD and later MOLG suffered from the absence of well-established systems to implement this component. These assessments must be seen the overall challenging context in which the project unfolded and national as well as local management must be commended for overcoming a series of exogenous strains. The overall rating is therefore (2-3).

44. **Performance of Non-Governmental and Community Based Organizations.** UNICEF had the responsibility for the failed drinking water component. The WRD and later the MOLG similarly were responsible in management and implementation. A number of things went wrong pertaining to weak feasibility reports and designs, weak hydrological investigations and weak implementation. UNICEF's performance in supervision was very weak, as is clear from the frequently changing design concepts, the lack of quality supervision of fieldwork, absence of standard practices for hydrogeological investigations, and the many inaccuracies in the commissioned designs. It is understood that improvement is immanent, though with a lot of delay. The overall rating is therefore (1).

45. **Performance of Co-financiers.** Under the Joint Program BSF has transferred the responsibility of spending and administring its two grants (BF-13 and BF-14) to IFAD. By and large BSF's role appears to have come into play particularly when there were requests for extension or reallocations. In the early years BSF fielded a person to two of the first supervision missions, but later its participation in these missions was limited. Engagement was by staff posted at different new field delegations or seconded to IFAD under the Joint Program, which makes continuity and follow-up more difficult. BSF fielded an observer to accompany the evaluation mission; this was highly appreciated, as this contact was constructive and provided much valued insights. The overall rating is (3).

### VII. OVERALL ASSESSMENTS AND CONCLUSIONS

46. The overall performance of ELWDP – when assessed against the objectives in the SAR – is modest. The overall assessment of impact on rural poverty alleviation is also rated as modest. However, it must be emphasized that the impact assessment is based on only two years of full operation and that the potential for the future impact of ELDWP may be higher.

47. Explanation for the modest ranking of overall project performance is found in the fact that several components initially planned could not be taken up or completed, such as the Wadi Labka spate works, the road component and the drinking water component. This was due to inaccurate assumptions at project design concerning government implementation capacity; optimistic estimates of project impact; and budget underestimates in the infrastructure components and limited contingencies.

48. The problem of budget underestimates was worsened because there were limited contingencies within the ELWDP budget. The consequent strategy was to cover shortfalls in one component by reducing the range of activities in another component. This was problematic because in the end financial commitments and not objective priorities determinined the course of events. Finishing the costly headworks became the highest priority, because they could not be left mid air. Instead the agriculture and livestock component was used as small change and was put on hold, even though its potential effect on agricultural productivity was high.

49. Explanation for the modest ranking is also found in implementation difficulties including inadequate supervision arrangements in the drinking water component; insufficient attention to farmers' participation at the early stages of the project; and inadequate staffing by the MOA. It is important to note that the inadequacy is in terms of numbers; the quality and commitment of staff is high. This in particular explains the considerable achievements made in the last four years.

50. Despite the shortcomings, it should be remembered that for a large part of the project duration ELWDP has been implemented under unusual circumstances – of post conflict, conflict and then again post conflict. This had a number of consequences for the project – no track record to build on, difficulty in making an adequate initial assessment of implementing capability, change in project staff, demobilization of consultants, cancellation of tenders and a shortage of skilled junior staff due to the ongoing mobilization (which continues into the present).

### VIII. RECOMMENDATIONS AND INSIGHTS

51. The mission concludes that even though the infrastructural investments are largely completed, ELWDP is still unfinished; ELWDP lends itself for further analysis and documentation in order to provide lessons for future spate irrigation strategies in Eritrea and elsewhere. Furthermore, as this project is evolving under the constraints of conflict and post-conflict, it also provides important insights in this respect.

### **Recommendations**

52. **Extend the project's closing date to mid 2006.** The objective of the extension will be to ensure the safe completion and sustainability of the project. The extension should be high on the management side and low on the disbursement side. The breaching bunds need to be examined; adequate time and resources are needed to bring the irrigation management transfer component, the command area development as well as the extension and training subcomponents to their full potential, making the entire project with more likelihood sustainable.

53. **Field an Expert in Financial Analysis.** Though there is no doubt that at audit level finances have been properly managed and expenditures can be justified. However, the current input based financial system could be improved in order to allow for a strategic use of project financial resources. Knowledge in financial project administration should be transferred to the project staff and systematic support by the donor be provided, if needed.

54. **Extend support to Sheeb Farmer Association.** Build upon the now well structured participatory processes and extend support to the Sheeb Farmer Association in terms of extending

training to the farmers to manage the operation of the head works. Capacity building should include the management of the earth moving equipment, training in budget administration including collection of fees, improvements in the command area development and including changes in the system of water distribution.

55. **Resolve operational problems in the spate system.** As a joint undertaking between MOA, Sheeb Farmer Association and external expertise, analyze whether the current design can accommodate the flood peaks – especially in Mai Ule. The mission concludes that the breaching bunds are the weak spot in the current design and represent a substantial liability and rik. This review should extend to a thorough review of the operation of the sediment ponds, as they are currently performing below expectation, filling up very rapidly and possibly intercepting fine silts in the early part of the flood season which otherwise could improve soil fertility.

56. **Discuss improved water distribution as part of the CAD subcomponent.** The participatory process followed in the last year has been instrumental in establishing effective communication between farmers and ELWDP and in identifying innovative designs. MOA field staff and the Sheeb Farmers Association should review and discus of the rules of water distribution, as they are applied within the command area. This should also address the supply of water to tail end/ overflow areas, without direct *mishgas*.

57. **Broaden scope of the agricultural extension component.** There is a well-established practice of dissemination of extension messages within communities. To enhance the performance of the contact farmers in particular, there is need to link them structurally to the frontline extension, and more importantly to the back-up provided by the sub-zoba/zoba subject matter specialists, and to field research. A major training/skills development program for both research and extension personnel and improving linkages between research and extension should be considered.

58. Identified priorities by the EAs, such as ground water irrigated horticulture and forage and feed production (drought resistant grasses and fast growing species and cultivars of fodder plants), as well as diversification into high value commercial crops including vegetables, watermelons and chillies may also hold potential. In the training and extension program, special care is needed to reach and engage female farmers – by tailoring training to women farmers' priorities or engaging female contact farmers. To prevent the agricultural and livestock component from becoming a side-show, it would be necessary to adequately resource it with senior capacity to assist the EAs.

59. **Establish paravet associations.** It is recommended that local paravet associations are supported by ELWDP and MOA, possibly arranging the supply of drugs from the MOA animal health clinics and coordinate training needs.

60. Utilize stored material of the drinking water component. The material for the drinking water component that was procured in 1999/2000 is still unutilized. There is still ambiguity as to what part of it will be used in the proposed Cooperazione Italiana funded drinking water systems in Sheeb. It is recommended that UNICEF and MOLG update the inventory of stored material and prepare a plan on where to utilize it, in Sheeb or elsewhere in the country.

61. **Undertake water quality survey.** There is no certainty about the supply of safe drinking water in the area. There has not been a water quality survey that covered all wells and known sources. It is recommended that MOLG/UNICEF commission such a comprehensive inventory. The survey should be shared with the health workers in the area. It may also be extended to the salinity and sodicity parameters, that affect crop production.

### <u>Insights</u>

62. Limit the number of project components when operating in conflict and post conflict situations. It is recommended to and provide a clearer focus, particularly in conflict and post conflict situations. The spate irrigation component, being the most cacpital intensive one, received the major share of project management and supervision time. It is recommended that in future projects of this nature IFAD tries to provide a stronger single focus, taking cognizance that in a package that combines capital intensive and low investment measures, the latter may get low priority. In post-

conflict situations due attention should be given to components that quickly rectify immediate resource constraints – such as the supply of draught animals or bulldozers for earth works.

63. **Initiate monitoring mechanisms at an early stage in the project.** It is recommended that monitoring and activity-based budgeting procedures are put in place at a very early stage of project implementation. By establishing a baseline and following up with simple indicators to be collected regularly, impact can be assessed continuously and feedback can quickly influence decision making processes. IFAD as a funding agency may take responsibility in this regard rather than assuming that it will be done by a usually overburdened project management unit.

64. **Consider alternative implementation capacity strategies in Eritrea.** Capacity constraints necessitated a reformulation of modalities in the early stage of the project. It is recommended that in future projects alternative capacity strategies be considered. This could take the form of engaging staff on private sector contracts rather than as employees of the MOA. Another strategy is to more actively engage, where possible, local people on part-payment basis – following the example of the successful paravet program.

65. Systematically structure farmer participation from the onset of the project. Farmer management and farmer participation should be organized in a systematic manner. Farmers formulated their recommendations for future projects as follows: more formal and structured consultation, rethinking of design parameters and an earlier start to the establishment of the farmers associations.

66. **Revisit the approach to spate irrigation development.** It is recommended that in spate irrigation development in Eritrea a broad range of options be considered and that improving or supporting spate irrigation not be automatically equated with the development of civil works, particularly not the top range solutions that were adopted in Wadi Laba and Mai Ule. Moreover, in many locations the headworks may be technically difficult, economically not viable, and difficult to manage. In these areas the improvement in command areas networks and water distribution, the development of spate systems on smaller tributaries, the use of low-cost technology to strengthen traditional diversions, the introduction of improved draught animals and the development of high value cropping patterns may all a be better value-for-money.

### **State of Eritrea**

### Eastern Lowlands Wadi Development Project

### **Main Report**

### I. INTRODUCTION

1. The Mission was mounted by the Office of Evaluation of IFAD. The **objectives** were: to assess and document the impact and sustainability of the Project; and specifically to assess the extent to which the project has achieved its aim of developing a spate irrigation system that can be replicated in other areas of the Lowlands and to derive lessons from this experience for the benefit of similar interventions.

### A. Background of the Evaluation

2. This report documents the findings of the completion evaluation of the Eastern Lowlands Wadi Development Project I-365-ER (ELWDP) in Eritrea. ELWDP was identified in 1993, shortly after Eritrea became independent. For the International Fund for Agricultural Development (IFAD) it was the first operation in the country and IFAD joined other funding agencies in investing in the new country. The Staff Appraisal Report (SAR) was prepared in 1994. The loan agreement was signed on 30 January 1995 and the project became effective on 1 March 1995. The two BSF Grant Agreements BG-0130ER and BG-014-ER had both been signed on 30 January 1995. A launching workshop took place in May of the same year. ELWDP was scheduled to be completed by December 2000, but the war with Ethiopia from 1998 to 2000 made this deadline unfeasible. The ELWDP closure date was first extended by IFAD to December 2002 and then to December 2004. The Belgian Survival Fund has formally approved extension up to December 2002 and then to December 2004 – the latter subject to two conditions (the appointment of a financial manager and improvement of financial administration).

3. The evaluation was initiated with the preparation of a draft Approach Paper outlining the status and identifying the main issues in the project. The Approach Paper was prepared by staff of the Office of Evaluation (OE) of IFAD and was finalized in consultation with the Ministry of Agriculture (MOA) in the early part of the evaluation mission. The fieldwork for the evaluation took place from 22 November to 12 December 2003 and was undertaken by a team with various disciplines represented – spate irrigation/ water management, anthropology, drinking water supply, and socio-economics (see annexure 1 for the terms-of-reference). During the field visit to the Sheeb Area the team was assisted by four local researchers/ translators with a background in agronomy and sociology. A resource person from the Belgian Survival Fund joined the latter part of the evaluation mission. The objectives of the evaluation, as described in the Approach Paper, were:

(i) to assess the achievements of the project and its effect and impact on the target group in relation to the original parameters defined in the project design and changes introduced thereof during implementation;

(ii) to assess the extent to which the project has achieved its aim of developing a spate irrigation system that can be replicated in other areas of the Lowlands;

- (iii) to assess future options for IFAD involvement in the Lowlands;
- (iv) to derive lessons from this experience for the benefit of similar interventions;

(v) to assess local capacities at zoba- and sub-zoba level for other forms of low cost spate irrigation systems in the Eastern Lowlands.

4. The evaluation uses the standard methodology practised by IFAD in all its evaluations in order to compare performance and impact across sectors and countries. This approach is described in 'A Methodological Framework for Project Evaluation' (IFAD 2003). The structure of this report is similar to other evaluation reports. The report starts with a discussion of the design features of the project (section II). Section III is a summary of the implementation results of ELWDP; the next

section (IV) looks at the extent to which these implementation results contribute to the achievement of project objectives. Finally section V discusses the overarching goal of rural poverty alleviation. Next the performance of the different partners is assessed. The report concludes with an overall assessment of the project with conclusions, insights and recommendations (sections VII and VIII). Two annexures describe two important components of the project in greater detail, spate irrigation development and drinking water supply.

### B. Approach and Methodology

5. Data collection for the evaluation started with a desk review of key documents, in particular the SAR, progress reports, IDA supervision reports and aide memoires as well as consultancy reports and studies. A one week preparatory mission to the capital as well as to the field was carried out in order to learn about the expectations of key stakeholders, inform about IFAD's evaluation process, to collect key data and to establish the Core Learning Partnership.

6. The mission started in Rome, where briefings were given at IFAD headquarters by the Director of East Africa, a Senior Evaluation Officer, the Country Portfolio Manager as well as BSF Program Manager and Assistant Program Manager. It then left for Asmara, where a discussion was organized under the chairmanship of the acting Minister of Agriculture. Several other interviews were held in Asmara including the MOA staff – in particular the Project Coordinator, the Procurement and Accounting Officers, staff of World Bank, UNICEF, Ministry of Local Government (MOLG), Water Resources Department (WRD), Cooperazione Italiana, the University of Asmara team responsible for the Socio-Economic Baseline Study; and several NGOs operating in water supply and food aid.

7. The evaluation was undertaken in the absence of consolidated baseline or impact data. This was an important handicap. On several occasions during the course of the project the development of a monitoring system was brought up. The SAR includes a list of provisional indicators – measuring implementation progress and impact – and suggests that the Monitoring and Evaluation Unit of the MOA prepare an annual monitoring report. The first supervision missions reiterate this and emphasize the importance of relatively simple diagnostic surveys and the use of easy and unambiguous indicators. However, the socio-economic study was completed using the services of a Sudanese consultant. The survey was based on interviews with 661 heads of households in the Sheeb and Wadi Labka command areas, comprising a sample of approximately 10%. The survey produced a comprehensive narrative description of seven villages in Sheeb and ten in Wadi Labka, but it fell short of generating a baseline on main indicators, such as cropped areas or yields. Later inputs in monitoring and evaluation did not provide data on the pre-project situation.

8. The current evaluation therefore had to rely relatively heavily on first hand fact finding in the field. Information, often qualitative in nature, was collected from a range of stakeholders and players through retrospective interviewing, asking respondents to describe the changes they assessed were triggered by the project and the changes that in their view did not happen. This information was triangulated, i.e. information from different sources was compared for consistency. The triangulation was done by source and by method. Triangulation by source included informal interviews with the staff of the MOA field unit, the local administration, the school principal, the Mensheeb health clinic and the Eritrean Relief and Refugee Commission (ERREC), as well as study of available project reports and data compilations made available to the mission by the interviewed.

9. Triangulation by method included participatory learning and action techniques, in particular joint transect walks, focus group interviews and a stakeholders workshop. The different investigations were undertaken on the basis of the different irrigation subcommands in Sheeb, locally known as '*parta*'. These *parta* are the main organizing units in the spate irrigation system and have been used as the unit of analysis. In all, there are seven *partas* in Sheeb. Transect walks were undertaken in five of these. This served to directly observe and measure cropped area, in order not to rely on local experience and perceptions only. In the transect walk the standing crop is systematically recorded after a fixed interval, the distance of the interval depending on the size of the area. This way a systematic sample of the crop cultivation in the command area was obtained.

10. Farmer focus group discussion were organized in six units: Bises, Ide Abay, Sheeb Kateen, Debret, Tiluk, and Emdena. Three focus groups were done with women (Errem, Emdena and Ide Abay). On the livestock and agricultural component in particular six additional focus group discussion and five indepth interviews were organized in the subcommands in Sheeb and in Wadi Labka. Seperate discussions took place with the selected contact farmers and Community Animal Health Workers. A one-day workshop with 14 *ternafis* was carried out in Mensheeb, which led to a negotiated assessment and generated a set of recommendations. A drawing session was organized with 45 sixth-grade children in the middle school in Mensheeb, where children were asked to express their perception of the changes that had occurred in their families, the crops and livestock before and after the civil structures. A professional photographer documented the project, directed by one of the farmer leaders.

11. Further, to objectify perceptions, attention was paid both to the opinions that respondents expressed and those they did not express – as the latter also conveys important messages. In addition, visits were paid to a control area (Wadi Labka) as well as to the highland area, where a large part of the semi-nomadic population resides in the summer season. A significant caveat is that the evaluation was done with the main investment in the spate works being in its second year of operation only.

12. The preliminary findings of the evaluation were presented and discussed in a debriefing workshop in Asmara, immediately after the field work.

### II. MAIN DESIGN FEATURES

### A. Project Rationale and Strategy

13. ELWDP was initiated at a time when Eritrea was emerging from a prolonged armed conflict. The struggle caused considerable damage to the agricultural production systems in the Eastern Lowlands. The depleted stock of draught animals was identified as the single most important factor in causing the fall in production, making it more difficult to construct traditional diversion structures and undertake the necessary soil water conservation operations.

14. At the same time the development of spate irrigation was (and still is) seen as a main avenue to increasing crop production in Eritrea and addressing the serious lack of food security. There are almost no perennial sources of surface water in the country. Groundwater potential as far as is known is limited and fragile and sedimentation limits the lifetime of micro-dams. Engineered headworks were at the time the state of the art in spate irrigation development, following considerable investment in Yemen by the World Bank (Tihama Plains) and USSR (South Yemen) (see also annexure 2). According to several persons involved in ELWDP preparation there was considerable optimism within Eritrea about the capacity to develop such systems nationally. Further, following the experience with the local councils (*baitos*), confidence in the local government technical competence as well as its ability to structure local participation was high.

15. Spate irrigation rehabilitation was the central component of ELWDP, but several other components were incorporated that would complement each other both at the operational and impact level. These included agriculture and livestock development; drinking water supply, upgrading of the access road and project management. The drinking water supply component was expected to remove a major constraint in the permanent habitation of the area. The road component would facilitate the implementation of the project and boost marketing prospects. The livestock component would address the major bottleneck in farm operations. In comparison to spate irrigation investments elsewhere, the range of activities in ELWDP was relatively broad, though the approach (as stated in the SAR) was to keep the project simple and straightforward, as the government administration was still evolving.

### B. Project Area and Target Group

16. The project was to be implemented in the Sheeb and Wadi Labka areas of the Eastern Lowlands. Both areas are relatively well-established agricultural areas, where spate irrigation was introduced 50 to 80 years ago. Traditionally, acacia brushwood, stone and soil structures are used to deflect flood flows from the ephemeral rivers. According to the 1997 Engineering Feasibility Report, the areas irrigated in a normal year of spate flows in Sheeb (by Wadi Laba and Mai Ule) are 2800 ha

and 850 ha respectively, whereas in Wadi Labka the command area is assessed at 2400 ha. This brings the total to 6050 ha, a figure revised upwards (by 30%) from the SAR estimate after reinterpretation of aerial photographs. The land is government property but usufruct is given on a long-term basis. The median farm size within the irrigable areas is approximately 1 ha per farmer. The command area is divided into different subareas, each headed by three elected leaders, called *ternafi*. The command area of Wadi Laba for instance consists of Sheeb Kateen, Bises, Ide Abay, Errem and Debret. Mai Ule provides water to Tiluk and Kirfotat. Emdena is an overflow area supplied by both systems.

17. The livelihood system is agro-pastoralist and semi-nomadic. Families derive income from the spate irrigated agriculture, from livestock keeping and from labour opportunities in the highlands. During the months of April to September/ October a large part of the population (approximately 83%), comprising mainly women and children, moves to the highlands, to areas such as Gheleb, Gizgiza, and Afabet. They travel a distance of 70-90 kilometers, along with much of the livestock, to escape the heat (40-50 degrees Celsius) and scorching winds, and the shortage of food and water. Many men stay behind or move up and down to tend to the farmland, and to repair the diversion structures (*agim*) flood channels (*mishgas*) and field bunds. Single female heads of households who account for approximately 20% of all households also perform farm duties. During the harvest season labourers from the highland communities work in the lowlands. It is unusual though not uncommon for households to have access to land in both the lowlands and highlands.

18. There are several estimates on the population of the area. The SAR (1995) calculated the population of the project area as 36000, with 22500 persons residing in 9 villages in the Sheeb/Ghedged area and 13500 in the 15 villages in Wadi Labka. The Ghedged area was not supposed to be served by the spate irrigation component, though the area would benefit from an improvement in the drinking water supply. In 1997, the population for the Sheeb area - (which ultimately became the only target project area – see section III) was estimated at 21900 (3650 households). For 2002 and 2003 the population in Sheeb was estimated at 19710 and 14900 (see table 1). These differences may be largely explained by the annual fluctuation in the nomadic and semi-nomadic population coupled with the different data sources used, but structural and circumstantial factors may have caused the apparent downward trend as well - the military draft and the migration to cities.

Wadi	Kebabi	No. HH	Population	No. HH	Population	No. HH	Population
	Admin	1997	1997	2002	2002	2003	2003
Laba	MenSheeb	2 800	16 800	2 502	12 510	1 977	10 556
Mai Ule	Tiluk	850	5 100	1 440	7 200	888	4 344
Total		3 650	21 900	3 942	19 710	2 865	14 900

Table 1 Estimated population in project area in 1997, 2002 and 2003

Source: Daniel Manner (1997), Local Project Coordination (2002), and Sub-Zoba MenSheeb (2003)

19. The main target group of ELWDP are those with access to land irrigated from the spate system. This number is estimated at 3500 households in Sheeb. Not all persons resident in the area have land that is irrigated. In focus group interviews in the different partas of Sheeb the number of households with land outside the command area was estimated between 10 and 60%. Within the command area, there is a certain amount of variation in water supply, because it is in the nature of spate irrigation that not all land is served. The probability that land will receive water varies with elevation, head/ tail location or distance from flood channels. This difference is evened out to some degree by the prevailing traditional water distribution rules, which, among other things, lay down that unirrigated land gets priority on a subsequent flood, as far as possible.

20. One of the assumptions of the project was that no new land would be irrigated; so the have-nots would not benefit directly but at best through improved labour opportunities. The main impact envisaged from improved diversion was the increased reliability of irrigation within spate command areas. Therefore those landowners whose land received erratic supply would be the main direct beneficiaries of the spate component. The other components in ELWDP would serve different target groups. Drinking water supply and road development would address the needs of the entire population in the project area; and the livestock component the owners of livestock.

### C. Goals, Objectives and Components

21. The objectives of the project were formulated as follows in the SAR:

- Rehabilitating and improving spate irrigation based agricultural systems in at least two areas of the Eastern Lowlands (i.e., Sheeb and Wadi Labka) so as to promote a major expansion of smallholder production of basic staples to increase the food security of the semi-nomadic population.
- Strengthening the enduring capacity of the Ministry of Agriculture to plan and implement similar activities in economically viable production zones of the Eastern Lowlands and eventually the Western Lowlands.

22. To put these objectives in perspective, the economic analysis in the SAR gives the order of magnitude of the "major expansion" in agricultural production. It assumes that the improved diversion structures will increase the average crop coverage of the area from 30 to 73%. The project was further expected to bring a 150% increase in crop yield. A new economic analysis was undertaken as part of the engineering feasibility study (1997). This assumes that the area under cultivation would increase from 45% to 95% in a median year, whereas crop yields would at the same time double. In both cases yields were to increase with a factor four. Such projections are on the very high side, particularly because the traditional spate management system in Sheeb and Wadi Labka is already well established and in each 10 years period there are already 2-3 years with nearly full crop coverage for instance.

23. Because of the strategy of concentrating irrigation on a limited area crop yields in the area were moreover unusually high for spate systems and in good years for sorghum for instance already reached 6 ton/ha.

24. With respect to the expected targets for the "capacity building" objective: a number of possible wadi improvements in the Eastern Lowlands were identified. The suggestion was that ELWDP approach would one day extend to those areas.

25. For the different project components, objectives were formulated only in broad output terms for planning purposes and not in impact terms. For several components the intention was that more precise plans would be developed only after the project started. Table 3 (in section III) gives more details on the expected output for the different components.

### **D.** Implementation Partners and Arrangements

26. The project was funded by IFAD and BSF. Total project costs were set at USD 20,1 of which IFAD provided a loan of USD 11 and BSF a grant of USD 2. The balance was to be contributed by the Government of Eritrea (GOE). No explicit farmer contribution was foreseen in the original project documents, but in the latter part of the project farmers contributed the equivalent of USD 0.1 M to the command area development works. This budget was allocated to the different components as follows: spate irrigation (66%), agricultural and livestock (12%), roads (10%), domestic water supply (7%) and coordination (5%). The BSF contribution was made available in two different grants. The first grant was earmarked for domestic water supply, whereas the second grant was dedicated to road, agricultural and livestock components.



**Photo 1: Sorghum yields** in good years in Sheeb are significantly higher than they are in spate systems elsewhere in the world – because of the prevailing practice of concentrating the spate water supplies on a small area. IFAD photo by Frank van Steenbergen.

27. For four out five components of ELWDP coordination would rest with the MOA. The MOA would be responsible for the spate irrigation component, the agricultural and livestock development component, the roads component and project management. The spate irrigation and agricultural and livestock components would be implemented by the MOA directly, using technical assistance services as required. The roads component would be implemented by the Ministry of Communication (MOC), and coordinated by the Ministry of Agriculture.

28. IDA was asked to supervise these components of ELWDP. A Project Steering Committee (PSC) would bring together the heads of all participating departments of MOA under the chairmanship of the Director, Planning and Programs Department. The provincial administrators and representatives of MOA would also be members. Day-to-day management would be in the hands of a designated program manager, who would be assisted by a socio-economist and an accounts clerk. In Sheeb, where there were hardly any permanent facilities at the start of ELWDP, an on-site project office would be built.

29. The main exception to these general implementation arrangements was the drinking water component, funded under the separate BSF-grant. For this, a parallel arrangement was set up. Implementation was by UNICEF "in collaboration" with the Ministry of Energy, Mines and Water Resources, in particular the Water Resources Department (WRD). A separate agreement to this effect was signed between the UNICEF Headquarters and IFAD.

30. In the original arrangements no explicit attention was given to the role of farmers in implementation, even though the spate systems were supposed to be farmer-managed in the end.

### E. Major Changes in Policy and Institutions during Implementation

31. No major changes were made in policy during implementation, but there were several changes in the institutional arrangements. These included greater use of private sector services than originally anticipated; greater emphasis on local coordination in the latter part of the project, and changes in the role played by the ministries.

32. The greater use of private sector services was to a large extent a response to capacity constraints within the implementing government organizations. These constraints made it difficult to perform certain tasks in-house. After considerable discussion during the preparatory phase of the project, it had been agreed to implement (for instance) the construction of the spate civil works on a force account basis. Designs would be prepared by the engineering staff of the MOA. International technical assistance would be provided to support, but not to implement the project. These propositions had to be reconsidered. In the first project year, a package of international engineering services was prepared, whereby the entire responsibility for survey and design rested with an international firm. To rely on the limited capacity – also in terms of actual numbers – within MOA was considered too risky. This was extended to engineering supervision. The same was true of the drinking water component. The WRD had difficulty mobilizing qualified staff to carry out the hydrogeological locical study. Consequently, three Eritrean consultancy firms were invited to tender for the feasibility study.

33. The original implementation arrangements foresaw a National Project Steering Committee, but not a local equivalent. When the project moved into implementation the need for local coordination became larger. At the same time the decentralization process in Eritrea had redefined the roles of central ministries such as MOA in providing guidance and support, while the field staff was placed under the *zoba* administration. To improve local coordination a Local Project Steering Committee (LPSC) was formed. Apart from the project coordinator and the local project staff, this committee consists of representatives of the zonal administration of the MOA, a representative from among the sub-zonal division heads of agriculture, research and irrigation, and a representative of the village administration (*kebabi*) in Wadi Laba, Mai Ule and Wadi Labka. The LPSC met quarterly in 2001. From September 2002 onwards the LPSC also included the farmer leaders (*ternafi*). The role of the LPSC was to:

- facilitate communication between farmers and the project management;
- jointly monitor project progress and prepare future plans;
- assist in identifying and organizing the local labor contributions;
- assist the future operation and maintenance of the diversion works and improvement of distribution canals by farmers.

34. On the drinking water front there were several changes in the mandates in 1996-1998. Implementation activities were removed from WRD and were supposed to be placed with a new parastatal, the Eritrean Well Drilling Company. Subsequently the role of the Ministry of Local Government (MOLG) expanded; it was made responsible for supervising the works, as it was to finally own the infrastructure.

35. In the field of institutional development a major missing element for a long time was the development of a farmers' organization. This backlog was recouped from 2002 onwards and systematic preparations have been made for the Sheeb Farmers' Association. Its structures and rules, described in the draft Constitution, are based on extensive farmer participation. Though large informal farmer organizations exist in spate systems in various countries, the Sheeb Association will be the firrst farmer organization running an entire modernized system.

### F. Design Changes during Implementation

36. A number of design changes were made in the ELWDP. Most of these changes were formalized after the project restarted in 2000, following the end of the open hostilities between Eritrea and Ethiopia. The main changes were the cancellation of the spate diversion component for Wadi Labka and the removal of the road component from the ELWDP budget. Two new subcomponents were added: the CAD subcomponent and the IMT component. Earlier the content of the drinking water component under the BSF-grant had been redefined so as to concentrate on Mensheeb only.

37. A two-year extension was granted in April 2002 for the loan and grant components. Another two-year extension was granted for both components in July 2002 - so the project closure date became December 2004. In 2002, massive floods (see also section III) caused extensive damage, and a crash emergency repair program was undertaken, funded by reallocations from the agricultural and livestock program.

38. Concommittant with these changes, the budget was reallocated. The original budget allocations were given in broad categories of expenditures. Their break up in the loan component is shown in table 2.

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No	Category	Loan in SDR	Reimbursement schedule
Ι	Civil Works Spate	2,290,000	100% foreign
	Component		100% local material ex-factory
			95% local
II	Vehicles, equipment, material	3,000,000	As above
	for Spate Component and		
	Project Coordination		
III	Technical Assistance and	1,120,000	100%
	Training for Spate		
	Component and Project		
	Coordination		
IV	Incremental Operating Costs	360,000	90% up to SDR 200,000
	for for Spate Component and		70% up to SDR 360,000
	Project Coordination		50% thereafter
V	Unallocated	1,780,000	

Table 2: Original loan expenditure categories

39. With the redefinition of project components SDR 200 000 was reallocated from category III to category I within the loan agreement to ensure sufficient funds for the CAD program. At the same time, part of the BSF grant, BEF 31 800 000 (USD 706 666), originally allocated to the road component under category IV in the Loan Agreement were transferred to other categories to help finance the IMT component (USD 586 055), and the 2002 AWPB and the strengthened program of activities for the crops and livestock development (including some emergency repairs). This was modified and approved by IFAD in February 2003.

### III. SUMMARY IMPLEMENTATION RESULTS

40. This section discusses the implementation results of the ELWDP. This chapter is arranged according to the main project components. Table 3 compares planned and actual outputs at a glance. Annexures I and II describe in detail the implementation results of two main components funded under ELWDP – spate irrigation and drinking water supply. Annex I has also been prepared as a brief introduction to the spate irrigation and the different approaches in supporting it.

### Spate irrigation component

### Main civil works

41. In spate irrigation episodic floods are diverted from river beds to irrigate agricultural land prior to sowing. It is a precarious form of water management as diversion structures may not stand up to the floods and sediment deposition can be substantial. In traditional systems the weakness of the structures usually guarantees that destructive floods do not reach the command area and excessive sedimentation does not take place, but at the same time farming is marked by a considerable degree of uncertainty.



Photo 2: <u>In spate irrigation flood water with high sediment loads is diverted for agriculture</u>. *IFAD photo by Frank van Steenbergen*.

42. The new spate irrigation works foreseen under ELWDP were built to control the large and medium floods so as to divert these for irrigation. They were also meant to reduce damage to the command area from uncontrolled flooding by major spates. A study tour early in the project by IDA and MOA staff to modernized spate systems in the Tihama, Yemen confirmed the complex challenge of managing both high floods and sedimentation in these heavily-engineered systems. The absence of reliable data for the area – essential for calculating the flood curves and maximum flood peaks - was a major concern in preparing the designs. WRD was requested to set up monitoring stations but this did not materialize. Finally, one-year data on flood flows, sediment rates and rainfall were collected by the engineering consultants and data sets from Massawa were used to estimate the floodgraphs.

43. Detailed designs were made in 1997-1998 for the three systems by the international consulting company (Halcrow/ Geoscience) selected for the job. The designs include several safety valves – scour sluices, gravel trap (or sedimentation pond), breaching bunds and rejection weirs. The Design Report (1998) claims that these engineering concepts were well understood by farmers, yet in the focus group discussions farmers mentioned the technicalities were not clear to them. A model was used in the discussion, but several farmers were under the impression that what was being built was a dam. The consultations, moreover, according to farmer interviews, were more in the nature of fact finding and discussion rather than coming to agreement.

44. No effort was made in this period to invest in the development of a local farmer organisation that would officially partner in the preparation and implementation of the project and would later take care of operation and maintenance. The supervision reports at this time show an emphasis on a timely completion of the civil works component rather than broadbasing the engineering process. This differs from what was and is considered normal practice in water development projects of this nature, particulary in an established traditional system there is already a local organization in place.

45. The final designs for the headworks of all three systems consisted of a weir, off-take gates, scour sluice, breaching bund and sedimentation pond. In Wadi Laba a culvert was included to divert water from the right bank to the left bank command area. The sedimentation ponds and culvert did not feature in the preliminary designs of the SAR and substantially increased the cost. Other factors that increased estimated costs at the engineering feasibility stage were the larger safety margin for the head regulators and the change from the originally envisaged force account implementation to international competitive bidding, which required the inclusion of contractor overheads. As the civil works costs had increased significantly, tripartite discussions were held with MOA, engineering consultants and IFAD. The cost savings identified related mainly to the downstream works. As the

civil works went out to tender, hostilities between Eritrea and Ethiopia erupted and work in the project was practically suspended for two years.

46. Activities were restarted in 2000. The Wadi Laba and Mai Ule works were tendered under ICB instead of force account, which further inflated costs. The contract was awarded at a cost of USD 3.53 M and USD 2.06 M respectively to CWE, a Chinese Contractor. The estimate for all works at Wadi Labka was USD 8.50 Million, which was beyond the budget of the project, therefore it was dropped. Wadi Labka was also relatively complicated because of the difficulty in supplying the left bank of the system from the planned headworks. The MOA and IFAD tried to identify other funding resources for this scheme, but did not succeed.

Construction in Wadi Laba and Mai Ule started in 2000. According to the focus group 47. discussion farmers leaders (ternafi) asked that the designs be adjusted, in particular that the diversion gates be made bigger. There was no follow up to these requests nor was this easy to materialize as the construction had already started<sup>1</sup>. The civil works were completed in 2002. In August of that year a massive flood occurred in both wadis. This flood is said to be equivalent to a 1:500 year flood, but in the absence of a time-series with rainfall data this can only be a guess. In a review just after the catastrophical event, the point was made that the bunds broke much later than anticipated. The unusual surge created havoc downstream and particularly damaged the gabion structures and earth bunds. In Sheeb, it also shattered the confidence of farmers in the usefulness of the civil works, particularly after the earlier complaints. The evaluation notes that in the analysis of the farmers the flood water could not be released in time by the small gates and from then on disaster was unavoidable. From end 2002 to early 2003 (making it in time for the next spate season) a crash program of emergency repairs was undertaken at a cost of USD 507,000. Part of this was undertaken on force account which meant a considerable cost saving over contractor rates. By this time a bulldozer, a loader and four tractors had been procured, which with other equipment were engaged in the repair works.

48. The 2003 season passed uneventfully in Wadi Laba, though at the farmers' request the height of the breaching bund was increased. According to the gate keeper, of the 41 floods in Wadi Laba five went over the weir and scour sluice. By building traditional *agims* in Sheeb Kateen and Ide Abay farmers diverted part of these peak flows. In Sheeb Kateen this was done to supplement the flows from the culvert, which are reported by farmers to be far less than what was expected. Particularly smaller floods are said to problematic as they cannot remove the sediment deposited in the culvert on the recession of an earlier flood. This issue needs further investigation.

49. The sedimentation pond in Wadi Laba silted midway through the season, mainly with very fine sediment. Though it was meant to be cleaned out constantly by a bulldozer, this has not been possible because the material in the pond was too wet to support bulldozer movement. The bulldozer instead has been put to active and relevant use in repairing flood channels and plugging gullies inside the command area. The coarse material dropped in the sedimentation pond has been limited. This may be because the scour sluice was operated effectively. Since the *agim* to Sheeb Kateen picks up the water going through this scour sluice, there is a vested interest in keeping it open. In spate systems elsewhere in the world, this is exceptional and it is not unusual for scour sluices to be blocked on purpose by farmers not wanting to lose any of the flood water.

50. For Mai Ule 2003 was another lost year and the design with a long soil bund immediately downstream of the gorge, where the river bed is high gradient, is apparently not easy to make work.

<sup>&</sup>lt;sup>1</sup> Though the assessment of the size of the intake gates would require a detailed analysis beyond the scope of this evaluation, the complaint appears to have validity. For cost reasons, the length of the breaching bund was extended, and the bund was designed to breach once in five years average. This is a period considerably shorter than normal for breaching bunds. The breaching bunds in both Wadi Laba and Mai Ule seem to have been used to reduce costs as much as creating a device that would allow the handling of unusual big floods. If the size of the off-take structures and the weir would have been increased, the breaching period would be longer – and with this also the chance of a disastrous flood surge, which risk is associated with the current design concept. The design of the off-take gates did not take this into account but instead was based on the assumed water requirements in the command area. See annex 2 for a more detailed discussion.

The bund broke twice in 2003, the second time while the repairs were going on. The excess water was diverted to a right bank offshoot away from the command area and was lost. There has been substantial discussion in Mai Ule on building a gabion intake supplied by an *agim* further downstream to capture such run-away floods in the future, but so far no final agreement has been reached by farmers on the location of this new offtake.

### Command area development

51. Designs for command area development works were prepared in 1998 as part of the overall engineering design. Only division structures were identified under this component. At first low gated masonry/concrete structures were considered, but for cost reasons this was changed to gabion overflow structures with gabion mattress stilling basins.

52. There was prolonged uncertainty with respect to the implementation of the command area component under ELWDF. This uncertainty came to an end after the headworks for Wadi Labka were cancelled and some of the financial resources freed were routed to the command area works. For budget reasons it was decided that no more than 14 command area structures would be built. So far three structures have been completed using this formula and 11 more are planned for the coming season in seven locations. Where farmers use free intakes of flood water no structures are planned as they may not stand up to the floods.

53. In picking up speed the CAD program had to overcome considerable disillusionment among the farmers, because of the 2002 flood damage. Prior to agreement and construction in the CAD program there is now extensive discussion and consultation, using the traditional *ternafi* leadership. During the focus group interviews this process was uniformily appreciated and it was often noted that this "should have been done' with the main works. The price per structure ranges from USD 15984 to 26131 – and farmer contributions have been in the order of 7-39%. The farmers' share in the works is the loading and unloading of stones and the provision of unskilled labour. An innovative division structure was designed for Sheeb Kateen; this is essentially a curved gabion wall that divides the water between two areas, and also forces water out from the deepest regions, thus allowing more intensive cultivation in this particular section. This structure is good example of cross-fertilization of 'indigenous knowledge' and 'modern technology'.

### Irrigation management transfer

54. In spite of the recognized need for farmer management in the SAR, no specific plan of strengthening the farmer organization in ELWDP was included in the project design. Given the importance of farmers' participation the component was very late in coming. During the design of the civil works in 1998, a proposal for irrigation management transfer (IMT) was prepared, but not followed up. It was only after the project was restarted in 2000 that IMT took off. The January 2001 the supervision mission placed the delayed training of farmers and the development of a farmers' organization on the agenda. A proposal was prepared by an IFAD consultant in the same year. The cost of the subcomponent was estimated at USD 531000 (IDA Mission Feb. 4-19, 2002), which has been paid for by a reallocation within the BSF Grant<sup>2</sup>.

55. Since 2002 inputs by the short term international participatory irrigation management specialist and the local facilitor appointed in early 2003 have put this component on track. Significant progress was made after the implementation of a series of "farmer walk-through surveys". These surveys strengthened contacts with farmers, and gave the opportunity to raise concerns and pinpoint priority areas. Under the IMT program a start was made with the development of the apex Sheeb Farmers Association, that took over system management. The Sheeb Farmers Association is being grafted on the traditional organization in spate management, consisting of *ternafis* and *tashkils*. There has been extensive discussion on the new organization taking over the management of the works, culminating in the preparation of a Constitution. During the various investigations undertaken as part of this evaluation it was found that the contents of the proposed new constitution are widely known in the

<sup>&</sup>lt;sup>2</sup> The total expenditures to-date (December 2003) are USD 150 844.

different subcommands of Sheeb. The set up proposed for the Farmers Association includes several levels:

- a General Assembly, where all farmers are represented;
- An Executive Committee comprising 7-8 members with the *Kebabi* administration acting as advisor;
- The 21-24 *ternafis*, managing the different subcommands;
- 175 *tashkils* responsible for distinct parts within the subcommands.

56. As is the current practice, *ternafis* and *tashkils* continue to be democratically elected by their constituents. The election for the Farmers Association is due in December 2003 and the management transfer foresees a joint evaluation by MOA and the Association after one year of management. Though much ground has been covered, developing capacities to manage the structures in such areas as book keeping, work planning and system operation may still be a time-consuming process.

### Agricultural Development and Livestock Component

57. The Agriculture and Livestock Development Component aimed at the introduction of improved agricultural practices; support to adaptive research; improved animal health; improved input supplies and training of MOA extension staff and farmers. For all these activities subcomponents were developed. From the beginning, the approach was to work through and strengthen the existing extension services of the MOA in the project area. As a consequence the activities have generally followed national priorities and programs. The estimate of total expenditure to date on this component is USD 1,965,861<sup>3</sup>. The major part of the expenditure was directed at construction of offices, training facilities and clinic, computers and communication inputs, research activities, and drug supplies. The bulldozer and frontloader were paid for from this component too. Reported expenditures for training of MOA staff and farmers were moderate.

58. The implementation of the component suffered as did the other components from the force majeure in 1998-2000. The investments and reimbursement of recurrent costs under the component were next temporarily put on hold from 2000 to 2001 in order to conserve project resources to the spate irrigation component. It was not until July 2002 that the component was revitalized with the preparation of a detailed program, made by an IFAD-fielded consultant. The implementation has not yet fully taken off, because of the difficulty in recruiting extension agents, given the low salary levels in MOA. The implementation results for the subcomponents, as derived from quarterly and annual progress reports, are summarized in table 3 and discussed hereunder.

### Crop Production Subcomponent

59. The objective of this subcomponent was to strengthen the existing services in the project area by providing adequate facilities and equipment; and promoting better varieties and improved agronomic and crop protection practices. With respect to the first, construction of office, laboratory, training and accommodation facilities was completed in 2001. With respect to the second objective support to farmers' trainings has been provided. From 1997 to 2003, 278 farmers from the two sub*zobas* went through courses covering crop protection, soil and water management and plant management practices including field trials on horticulture. Also, home economics courses for 269 women covering nutritional issues, food handling and handicrafts were undertaken. Farmer interviews indicated that some trainings were found to be particularly useful. The training on horticulture especially received high ratings and the farmers interviewed had experimented with the information they acquired on their own farms. Interviews with untrained farmers confirmed that knowledge was passed on within larger groups. Among farm women interviewed the training in income-generating activities was very popular.

<sup>&</sup>lt;sup>3</sup> This figure is an estimate – because financial administration makes it difficult to unambiguously link expenditures to project components.

Component/subcomponent	Planned (SAR)	Actual (December 2003)
Spate irrigation		
	Civil works at Wadi Laba, Mai Ule	Civil works at Wadi Laba and Mai Ule
	and Wadi Labka serving an estimated	only serving an area of 3650 ha. Wadi
	area of 4670 ha	Labka design prepared but not
		implemented
CAD works	Assumed in above	Five structures constructed, 11 more
		planned
IMT	No special component	Draft constitution prepared and widely
		communicated. Elections for Sheeb
		Farmer Association prepared
	Not foreseen	Crash program of USD 507,000
		undertaken after 2002 flood
Agricultural and livestock c	omponent	
Crop Production	a) Strengthen the existing services in	a) MOA Compound completed with
	the project area through the provision	offices and training facilities. Vehicles
	of adequate facilities and equipment.	and equipment provided to the two sub-
	b) Promotion of better suited varieties	zobas
	and improved agronomic practices	b) and c) introduction of new sorghum
	through a field demonstration	varieties to 118 farmers and cotton on 175
	programme,	ha. Training courses for 637 farmers on
	c) Promotion of crop protection	improved agronomic practices, crop
	techniques and inputs.	protection and household economics. Sale
	b) and c) to be implemented via a	of insecticides and use of knapsack
	training programme for 624 farmers	sprayers and provision of assistance under
		serious pest attacks.
Support to adaptive	a) Identification of improved varieties	a) Trials on sorghum, sesame, millet and
research	through a field trial programme in	groundnut in collaboration with
	collaboration with ICRISAT	ICRISAT. 2 new sorghum varieties
	b) Development of a biological pest	released and distributed in 2003.
	control programme	b) No mention of biological pest control
	c) Development of research site	programme
		c) Until 2003, trials took place on rented
		land. A new research site is under
		development
Livestock Development	a)Enhance vaccination programmes	a) Provision of 353 554 treatments and
-	and provide a better availability of	vaccinations as well as training of 36
	drug supplies and treatments	paravets
	(expected number of vaccinations and	
	treatments: 365 250)	
Input supply	a) Step-up of the existing oxen	a) Introduction of 155 oxen
	acquisition programme to provide up	b) Distribution of at least 364 improved
	to 1 000 oxen to project beneficiaries.	scoops
	b) Possibly the introduction of 500	
	units of agricultural tools for draught	
	oxen.	
Training subcomponent	a) Strengthening of MOA staff	a) 50 staff members trained under the
	capacity (expected number of trained	adaptive research component
	staff: 170)	
Roads	Construction of 82 km of feeder road	Construction of 71 km of high grade
	with cross drainage structures	feeder road – but with only limited
	-	ELWDP funding
Drinking water supply	Water supply for 22000 persons – by	Designs and feasibility studies for three
	installing and improving 70-80 local	reticulation systems. Procurement of
	wells (purchase of drilling riggs,	material for Mensheeb Water Supply -
	material, studies and training)	not used. Construction started on Ghedget
		and Ghadim Halib – but without ELWDP
		funding

Table 3: Planned and actual ELWDP outputs (December 2003)

60. The general activities carried out by the extension services included tractor services, maintenance of irrigation banks and infrastructure with machines and labour, provision of inputs and aerial spraying of sorghum fields for pests, when outbreaks occur. A functioning 'pest scout' system is in place, in which selected farmers have been reruited to monitor and report on the occurrence of pests and crop diseases.

61. In order to further strengthen the extension capacity of the project area's extension services a "contact farmer" extension approach, aiming at creating more intensive linkages between research, extension and farmers, was launched in October 2002. Besides logistical and office supply support to Afabet and Sheeb sub-*zoba* offices, 13 MOA staff have been trained on participatory development, and an extension agent has been based in Sheeb since March 2003. Due to the unavailability of suitable applicants, willing to work for relatively low salaries, the 5 other EAs to be hired under the new approach have been put on hold. The EA has initiated the contact farmer establishment and is currently organising needs assessments and training programmes.

### Support to adaptive research

62. The adaptive research subcomponent was set up to scientifically evaluate high-yielding varieties and promising cultivars. The activity was undertaken in collaboration with ICRISAT and signifies one of the few efforts anywhere to improve crop varietes in spate irrigation. The major activities of the adaptive research were on-station and on-farm trials, adaptation and multiplication of improved sorghum varities, pearl millet, maize and groundnuts. Farmer field days have been held to involve farmers in varietal evaluation and selection of sorghum varieties. ELWDP supported the establishment of rented research plots in the area, provision of equipment, office facilities, vehicles, and financing of the MOA-ICRISAT collaboration. From 1997 to 1999, 37 MOA staff were trained abroad and in Asmara. Furthermore, a 50 ha permanent research station in Sheeb is currently being established; this will eventually become part of MOAs national research station network. The high point of the activity so far was that in 2003 two improved sorghum varities were released. It is still too early to judge how well the new varieties are accepted. However, the increased productivity of the improved sorghum varieties as experienced in the trials indicate that potential for future production increases exist, given that the varieties are broadly adopted. This will depend in part on whether the new varieties will fetch market prices comparable to the prices fetched by traditional varieties.

63. On MOA initiative, cotton adaptation and land preparation trials of cotton have started in 2003 along with sesame adaptation trials. Further trials on groundnut and watermelon are planned. The choice of crops reflects MOA's policy of promoting cash crops. Beyond these choices there appears to be scope for further diversification. In interviews contact farmers identified vegetable cultivation with low cost wells as a promising opportunity in Sheeb.

### Livestock Development Subcomponent

64. The livestock subcomponent focussed on improving livestock health through vaccinations and other veterinary services. At first, services were provided from the livestock health clinics located at the sub-*zoba* offices by the livestock specialists employed there. Project inputs included the provision of a clinic (not yet used), office and training facilities at the MOA compound, equipment and vehicles and vaccines and drugs, and training activities for 90 farmers in rangeland and forage management.

65. Since 2002, attention has shifted to the Community Animal Health Worker (CAHW) concept. In all, 36 CAHWs were trained during 2001 – 2003, paid a monthly incentive of 400 Nkf and provided with a veterinary kit<sup>4</sup>. The CAHW programme has proven effective. MOA staff at sub-*zoba* Sheeb estimate that approximately 90 percent of total treatment in the project area is now being carried out by the CAHWs. This was confirmed in farmers' interviews. In the first three quarters of 2003 alone, 22926 treatments were performed The CAHW programme has enhanced the coverage of livestock services. Each CAHW covers an area of 15-25 km radius, and reaches remote settlements, where all farmers with livestock problems gather to receive vaccines and treatments when the CAHW

<sup>&</sup>lt;sup>4</sup> Of these, 22 report to the clinic in Sheeb, 9 to the clinic in Afabet and 5 to the clinic in Ghinda.

visits their village. CAHWs charge around 10 percent of drug cost to their clients and depending on season, their income from treatments range from Nkf 200 to 600 a month with an average of 300 Nkf.

66. Not only do more remote villages now have access to basic animal health services, but the time to medication has been considerably reduced. However, interviewed farmers and CAHWs alike stress that the supply of drugs to the CAHWs is at times a constraint. Further, the lack of access to storage facilities has an adverse effect on CAHWs' services and earnings, forcing CAHWs to frequently travel as far as Masawa, at 80 km distance, to get new supplies.

### Input supplies

67. Shortage of draught animals following a long period of war was identified as an important bottleneck during the design of the project. The input supply subcomponent aimed to re-introduce 1000 oxen on credit terms, along with a number of other, smaller inputs.

68. In 1997-2000, 133 goats, 15 sheep, and 155 oxen were distributed, along with agro-inputs such as seeds and pesticides. After that the programme was discontinued. According to the project management, the priority and capacity of the management after 2000 were more geared towards the implementation of the spate component than to handling the logistical issues of managing a credit-based program. Figures from the Sheeb sub-*zoba* office indicate that there are 570 oxen in the project area, and that the number has gone down in the recent drought years. During the *ternafi* workshop it was estimated that 40 percent of households at present own their own bullocks, allowing them to plough on an average three times. Farmers who rely on renting oxen generally plough only once or twice.



Photo 3: <u>Draught animals</u> are crucial assets – among others because ploughing and bund repair is essential to conserve soil moisture. *Photo by Frank van Steenbergen*.

### Training Subcomponent

69. The training subcomponent was intended originally to train MOA staff in agricultural development, but was re-interpreted during implementation. The focus shifted to training of farmers and on-the job training of MOA engineering staff, and to a limited extent on training of MOA extension staff. Funding by different components became somewhat intertwined. In 2000 it was agreed that the training subcomponent under the BSF grant would cover training of farmers, the

development of farmers' organization to take responsibility of the O&M of the spate irrigation (see the IMT subcomponent) and training of MOA non-engineering staff.

### Drinking water component

70. The original intention of the drinking water component was to develop stand-alone rural water supply systems. The project budget was based on the procurement of drilling rigs and equipment for these wells. In the feasibility and design study commissioned by UNICEF in 1997 and undertaken by a local consultancy firm, the option to rehabilitate existing wells and equip them with appropriate sized pumps was investigated. During these studies however the suspicion arose that the wells around Mensheeb suffered from salinity levels that render the water unfit for drinking. For this reason the design concept was changed to common systems for the three main villages in Sheeb (Mensheeb, Bises, Tiluk) on the assumption that a proper, high quality source could be detected. The MoU between IFAD and UNICEF was amended accordingly in September 1997. Preparations for Wadi Labka could not take off, because of travel restrictions. Detailed designs for the three Sheeb systems were prepared in 1998. Cost estimates for these systems were 1.97 M. This left a funding gap of USD 1.14 M against the balance at that time in the particular grant component. A new concept was proposed during a 1998 supervision by IFAD, in which it was suggested to take water from a possible single source in the Wadi Laba gorge by gravity instead.

71. At the same time there was considerable concern about what to fund and what not to fund – given budget constraints. An IFAD supervision mission of October 1998 made it a point not to go ahead with the procurement of material unless there was assured budget to install the system. Even so UNICEF initiated the procurement of the supplies for the Mensheeb system<sup>5</sup>, operating under the assumption that total procurement costs would be low and would leave enough of a budget balance. However, the cost of material (at USD 640,000) turned out to be much higher than estimated by UNICEF<sup>6</sup>. The order arrived on site in 2000, where it was stored in the market building of Mensheeb. It still remains there. After this episode the budget dedicated for the ELWDP drinking water component was by and large exhausted. Apart from the feasibility study and the procurement, UNICEF/WRD had also fielded two community organisers who had to break the ground for community management and create awareness on clean drinking water and appropriate sanitation. In the absence of effective implementation these efforts turned out to be premature.

72. Discussions were held with Cooperazione Italiana to take over the drinking water component. At the same time it was proposed to expand the scope of works to include the neighbouring rural centres of Ghadim Halib (Wadi Labka) and Ghedged/Kilo. Cooperazione Italiana ordered a review of the workplans and the design. It then turned out that the assumed source at the Wadi Laba gorge, which was central to the Mensheeb water supply design and was expected to yield 60-120 l/s, had not been seriously investigated during the preparation or detailed design stage. When site investigations were finally made for the Cooperazione Italiana-funded infrastructure the source turned out to be non-existent.

<sup>&</sup>lt;sup>5</sup> It appears that funds for the procurement were inadvertently advanced by IFAD in the autumn of 1999 without the approval of the country portfolio manager.

<sup>&</sup>lt;sup>6</sup> It was in fact closer to an estimate by the local consultants, which put the costs of the Mensheed supplies at USD 763 000.



**Photo 4:** <u>The unused pipes of the drinking water component</u> stored in the Mensheeb market hall. *Photo by: Frank van Steenbergen.* 

73. In an attempt to find an alternative source three borings were made upstream of Mensheeb at 35-50 meters, at which depth the expectation was that the water would be safe. Though the aquifer yields were surpisingly high, unfortunately the nitrate levels were again above WHO standards. This delayed progress on the Mensheeb water supply system. For the Ghadim Halib and Ghedged/Kilo systems contracts were awarded in August 2003, but without prior investigation into nitrate levels. Designs –with several imprecisions - have been prepared again for the three systems. These do not systematically make use of the material which is already purchased. More than eight years after signing the MOU between IFAD and UNICEF the only visible results on site – apart from the large stock of pipes, paid for under the BSF grant, - are two extra boreholes, an access road and the beginning of a storage reservoir in Ghadim Halib, three extra boreholes in Mensheeb and one extra borehole in Ghedged, funded through the Cooperazione Italiana program. The three boreholes in Mensheeb and one extra borehole and Ghadim Halib.

### Road component

A road component was part of the original project plan. It was expected to improve marketing 74. of agricultural produce and facilitate the implementation of the project. A budget of 1.8 Million USD from the BSF Grant was earmarked to upgrade the 81 km dirt road from the project area to the Massawa-Asmara highway. This component was to be executed under a subcontracting arrangement between MOA and the MOC. Very early on in the project it was discovered that the financial outlay was a gross underestimation. The estimated cost for a feeder road based on MOC standards was USD 4.8 M instead. Because of the funding gap an impasse developed in early 1996; this was resolved at the end of the year, when the MOC proposed to take care of the balance funding. ELWDP - so it was agreed – would make proportional payments. At this time the MOC had already engaged a local engineering firm to do the surveys, engineering design and supervision. As this contract had not been seen or vetted by IDA, it could not be paid through ELWDP. This occurred again in the subsequent year when a contract was issued for the construction of the first 21 km stretch of road. In 2000 it was agreed that the GOE would finance the entire road with a higher-grade asphalt feeder at a total cost of USD 4.8 million. The BSF grant for this component would be reallocated to complete the civil works in the spate component.

### IV. PERFORMANCE OF THE PROJECT

75. The next two sections discuss the performance of the project: the first one analyzes the performance of the project in relation to its objectives, while the next section situates ELWDP within the context of IFAD's mandate and looks at the impact of the project on poverty alleviation

### A. Relevance of Objectives

76. The two objectives of the project are described in section II. They relate to increasing staple crop production and strenghtening the capacity of the MOA to develop spate irrigation systems. These objectives were supposed to contribute to increased food security. These objectives are in line with the Country Strategic Options Paper of IFAD (1998), which emphasizes the integration of livestock with cropping, reducing risks in smallholder agriculture and supporting national and decentralized capacity building. BSF advocates an even broader approach with access to markets, safe potable drinking water and primary health care is supposed to hold the key to household food and nutrition security. Experience from ELWDP indicates that all such components are useful improvements, but that because of the need to implement in a situation of capacity shortages and conflict situations a focus on a limited range of activities would be preferable.

77. The two objectives of ELWDP remain relevant today. Spate irrigation is still seen as one of the main avenues to increasing crop production in Eritrea, and this, given the scale of imported food aid, is particularly important. Moreover, in recent years the MOA has also promoted cash crops such as cotton, in spate irrigated areas. The second objective – of capacity building – remains equally relevant. The GOE continues to have plans to expand the area under spate irrigation. There are plans to prepare a very large new system in Naro in the Eastern Lowlands with funding from USAID/Africare. Similarly the intention is to develop many small spate systems in Gash Barka in the Western Lowlands, partly to accommodate returning refugees.

### **B.** Effectiveness

78. Effectiveness is defined as the extent to which the project's major objectives, as understood and documented at the time of evaluation, are expected to be achieved. Effectiveness results from two factors. First is the extent to which implementation results are achieved and second is the contribution of those implementation results to the project objectives. Table 3 (Section III) summarizes the first factor, i.e. the actual implementation results. In short, in the end in ELWDP spate irrigation systems were supported in only one out of two designated areas. The drinking water component did not come off the ground. The link road was constructed – but largely funded from outside ELWDP. The agricultural and livestock component was by and large implemented, as envisaged.

79. The second factor – the extent, to which the implementation results, that were achieved, contributed to the project objectives, is discussed below.

### Increased crop production

80. In assessing the effectiveness of ELWDP in expanding smallholder production of basic staples, caution must be exercised because the diversion structures have only been in operation for two years. Moreover, variability in crop production is inherent to spate irrigation, because of the different flood patterns. There are no baseline data apart from official statistics, the reliability of which for assessing impact may not be sufficient<sup>7</sup>.

81. To assess crop coverage transect walks were undertaken as part of the evaluation in six of the subcommand areas (*partas*) of Wadi Laba and Mai Ule. In the *partas* of Mai Ule between 12 to 38% of the land was cultivated, but the sorghum stands were poor as they had received only one irrigation. In the Wadi Laba *partas* the percentage cultivated was much higher – between 78 and 88%. Two to

<sup>&</sup>lt;sup>7</sup> Official crop figures are reproduced in the Socio-Economic Base Line Survey of 2001, prepared by Environmental Protection Service Consultant for MoA. Over the period 1994-2000 average crop yield was 30.0 quintal sorghum per year with a remarkable minimal variation (between 28-34 quintal). Average crop coverage is 85% in all these years, which seems high – given the coverage in the 2003/4 peak year (see text). Moreover, 1998 is earmarked as a poor year – different from what farmers indicated.

four irrigations had been applied, which would assure a yield of around 3000 kg on the first cutting and an estimated 50% more in the first ratoon. Land that was not cultivated in 2003 in the Wadi Laba *partas* suffered from damaged field channels and gully formation, not from inadequate irrigation supplies. A special case is Emdena, the *parta* at the tail of both Mai Ule and Wadi Laba. In Emdena only 19% of the land was cultivated. Being the tail-end overflow area, it is usually served only by larger and relatively uncontrolled floods.

82. The workshop with the *ternafis* substantiated the transect findings. In this workshop the *ternafis* were asked to estimate cropped area and crop yields for 2002 and 2003 and compare these with bad and good years. The estimates were then validated by other *ternafis*. Table 4 gives a summary of these estimates. Three of five *partas* in Wadi Laba (Bises, Errem and Ide Abay) expecting a bumper harvest this year. In the Sheeb Kateen *parta* in Wadi Laba, which is served by the culvert and by the new *agim*, yields are expect to be low, as most of the land was irrigated only once. In Debret yields are also reported to somewhat less than in a good year. Emdena expects very low yields, but 'good'years are very unusual in this *parta* because it does not have a flood channel of its own. The expectations for the two *partas* in Mai Ule are low, with one *parta* (Kirfotat) expecting the yield to be close to that of a bad year, as a result of the problematic functioning of the new headworks.

Wadi Laba	Total area in ha	Bad year 1996	Good year 1998	2002	2003
Sheeb Kateen	70	30	70	11	60
Bises	150	135	150	150	150
Errem	560	160	340	300	430
Emdena/Deket	360	150	200	0	60
Debret	320	100	200	120	200
Ide Abay	450	350	400	150	450
Mai Ule		Bad year 1986	Good year 1988	2002	2003
Teluk	700	40	700	350	260
Kirfotat	120	40	100	50	40

Table 4: Estimate in ha. of cultivated land in project area

Source: Workshop with Ternafis. December 7, 2003

83. A major finding in the evaluation is that none of the farmers interviewed attributed the good standing crop of this year in Wadi Laba to the improved control of water by the new headworks. Instead, the good results were uniformily ascribed to the good flood season. According to the MOA sub-*zoba* office Wadi Laba had 41 floods. Most of these floods were small or medium and could be fully controlled. Moreover, most floods arrived relatively early. In farmers views coverage and yields this year with the traditional diversion structures would have been equally good. In contrast, in Mai Ule the failure to capitalize on the floods is attributed to the problems with the breaching bund. Several good floods could not be diverted to the command area, though with the traditional system they might have been.

84. Instead, both in the focus group discussions and in the *ternafi* workshop farmers perceived the reduced maintenance burden as the main advantage of the new system. The construction of the traditional *agims* required a massive effort. The increasing difficulty of finding acacia trees and the shortage of draught animals made this task even more difficult. A second advantage identified is that the controlled flows cause less damage to field bunds and reduce the risk of gullying. In this respect the services of the project bulldozer and loader were highly appreciated, because they make it possible to restore this - sometimes long-standing - damage.

85. The major complaint is that very large floods are lost for irrigation, whereas in the past they were partly picked up by the traditional *agims*, even when they caused damage within the command area. According to *ternafis*, the term "mad flood" (a big uncontrollable flood) gained currency with the project. The failure of the 2002 season is directly ascribed to the breaking of the breaching bunds, related to the inadequate off-take gate capacity, and the relatively long time it took that year to restore the bunds (this has improved in 2003).

86. The impact of the other ELWDP activities on crop production is more difficult to establish, as it is difficult to attribute change to the concerned project components. The upgraded extension services and new sorghum varieties have been in place only recently and it is too early to establish adoption rates. Diversification into high value commercial crops including for example vegetables and cotton may hold potential, as cultivation of cereal crops alone seems unlikely to retain a positive rate of return on the substantial infrastructure investments. The livestock component is generally appreciated because it concerns a very critical asset. Livestock numbers in Sheeb however went down in the recent year because of the prevailing drought (including the aftermath of the 2002 flood episode), in spite of the livestock program.

### Capacity building

87. The second objective of ELWDP was to strengthen the capacity of the MOA to develop similar projects in the Eastern Lowlands and eventually in the Western Lowlands.

88. The capacity within the MOA to develop spate systems remains as limited today as it was at the start of the project. In Asmara it consists of a small number of specialists (3-5). The field staffs in Mensheeb has developed valuable skills in field engineering and mobilising farmers' participation, but again their number is limited to two engineers, an IMT facilitator and one extension worker. In the course of the project no systematic program of capacity building was developed and it appears that not all opportunities to transfer skills and techniques from the international consultants were used, as only few staff members were attached to the engineering team.

89. The main reason for the lack of achievement in this field is the absolute shortage of junior professionals in the country due to the mobilization of the armed forces. It is made worse by the difficulty of recruiting new employees to the MOA, because of low salary levels. The decentralization of the MOA to the *zoba* offices also makes it more difficult to create specialist teams within the MOA to work on spate irrigation. Elsewhere in the country (Western Lowlands) MOA staff is engaged in the design and development of far smaller spate irrigation systems than Sheeb. The quality of these designs is appropriate and the return to investment high (see annex 2) but the through-put of the work suffers from the limited number of field engineers made available for the activities.

### C. Efficiency

90. This efficiency section asks whether objectives could have been achieved at lower costs or with less effort. The issue is that of alternative strategies or alternative spending purposes. In case of ELWDP the questions are whether – given the objective of increased crop production – the approach taken was the most cost efficient one.

91. The route taken under ELDWP in spate irrigation improvement was comparatively costly. The costs for the Wadi Laba and Mai Ule headworks worked out to be USD 1420/ ha and USD 2420/ha respectively, or USD 1650/ha and USD 3094/ha, if costs of design and supervision are added. At these costs and given the lower reliability of irrigation in this system Mai Ule no longer met the criteria of reasonable economic feasibility. The cost per ha may also be compared with the cost estimates in the SAR, which stood at USD 2200/ha or with similar civil engineering investments in spate systems in other countries, which range around USD 1400/ha (see annexure 2).

92. To put these costs in perspective, they may be compared with other programs in Eritrea. In Gash Barka, smaller spate diversion systems are being developed with support from SOS-FAIM, at an investment cost of USD 120-480/ha. Because of the small size of the systems, engineering is relatively simple. In Ghatelai in the Eastern Lowlands, the Norwegian Church Aid supports traditional

systems at a cost of USD 51/ha – by providing gabions and making bullozer time available. Both figures are considerably lower than the costs associated with the heavy civil engineering works developed under ELDWP. It needs to be strongly emphasized that very different quantities are compared here, but the point to be made is that the approach adopted in ELWDP clearly is at the financial top-end.

93. The same can be said for the drinking water component. Originally this component was based on a large number of stand-alone systems, which would have been a relatively low cost option. This option had to be abandoned following the water quality investigations. The proposed systems carry an investment of USD 81/ capita in Ghadim Halib and more than 200 USD/ capita in Ghedged and Mensheeb. World average costs for similar rural water supply interventions are between 40 and 50 USD per capita.

94. Opting for relatively costly solutions has two drawbacks, apart from the financial aspect. First, the technologies applied are generally less amenable to local management, discussion and replication. Second, the most expensive components get the most attention. The risk is that the priority becomes to spend in a controlled manner rather than trying to achieve maximum impact. This can be seen from the livestock supplies component under which draught animals were distributed up to 1998. Access to draught animals has a considerable impact on crop production, because it makes it possible to conserve soil moisture through ploughing and repair of field bunds. In farmer interviews this impact was estimated upward of 30%. This component – in spite of its low cost and high cost efficiency –was not continued.

### V. IMPACT ON RURAL POVERTY

95. This section reviews the impact of ELWDP on different aspects of rural poverty. The definition of rural poverty impact, used in IFAD's methodological framework, is multidimensional. The domains, which are discussed in this section, range from physical and human assets, social capital and empowerment, to food security and institutions. In the Impact Matrix (Annexure 4) the different types of impacts are summarized in scores ranging from neglible to high<sup>8</sup>. These scores are referred to in this chapter. Where possible use has been made of data generated earlier in the project.

### A. Impact on Physical and Financial Assets (score 2)

96. The project had a small to modest impact on the productivity of the various physical assets. The main assets of relevance are land (which belongs to Government, but is given in usufruct) and livestock. The impact of the project on household consumables (houses, bicycles, radios) or financial assets is difficult to establish, but has probably been neutral. Many transactions on the ground continue to be based on a 'barter' system of goods and services. Microcredit does not exist. Shopkeepers and traders fill the gap. According to focus interviews the practice is for families to take goods at regular prices (food, clothing, shoes, farming equipment, seeds, etc.) throughout the year, and pay back with the harvest at prices set by shopkeepers, leaving only a small margin of earnings for the farmers themselves.

97. In comparison to the traditional system of spate irrigation the new diversion structures allow better control of water within the command area. They also reduce the risk of large floods, creating damage to land and flood channels. The impact of this improved control on land productivity varies across the different parts of the command area. In the traditional system larger floods often end up at the tail of the systems, whereas modest floods are concentrated at the head reaches. The reason is that irrigation in Sheeb is field to field, hence small floods (or floods that come late in the season) do not make it to the end of the command area. As a result in Wadi Laba the subcommands of Bises, Errem and (Debret and Ide Abay) may be equal or better off now than before, with a moderate flood. Ide Abay continues to operate an *agim* from the river in addition to the systems, which ensure good supplies. The problem area is Emdena, which is at the tail of both the Laba and Mai Ule system and is already marginalized in terms of spate supplies, as it does not have its own *mishga*. Improved

<sup>&</sup>lt;sup>8</sup> Scores: neglible is 1; modest is 2; substantial is 3 and high is 4.

upstream control<sup>9</sup> is unlikely to improve the situation for Emdena. The right bank command area of Sheeb Kateen is a special case. It is now officially supplied by the culvert, which, according to farmers, does not ensure full delivery because it is at a perpendicular angle in the gravel trap. Any improvement here is unlikely. The command areas of Tiluk and Kirfotat so far are worse off than before the project, because the Mai Ule headworks does not function according to plan.

98. As part of the civil works, a bulldozer and loader were provided. Though they were intended for the maintenance of the headworks, they have been put to use in the command area. Farmers report that the bulldozers have been very useful in repairing old flood damage and restoring flood channels.

99. The productivity of livestock has increased under the project. According to interviewed farmers, the CAHW programme is effective in improving the health of livestock. More remote villages now have access to basic animal health services, and farmers report that while earlier they had to travel long distances to reach the clinics, they can now seek help from the paravets before diseases turn critical. Of importance to the farmers is also that many of the CAHWs travel to the highlands with their communities, thus providing continous livestock health support. Most farmers are of the opinion that this has had a positive impact on their earnings from livestock keeping, but were unable to quantify this as the drought of the last three years has offset livestock productivity considerably.

100. The project has had no impact on absolute livestock numbers. The input supply subcomponent, under which oxen were distributed in the early years, was discontinued after 2000. When the project was started there was a concern that a shortage of draught animals (after years of war) would be a bottleneck, yet in subsequent years livestock numbers increased. One source from 1997 estimated that 70% of families own their draught animals. The importance of these draught animals is clear from the estimate at the *ternafi* workshop that having one's own bullocks makes it possible to increase crop production by at least 30%, because field bunding and ploughing greatly facilitate soil moisture conservation. The drought of the last three years however has greatly reduced livestock numbers<sup>10</sup>.



**Photo 5:** <u>The plugging of gullies with the project bulldozer has rehabilitated</u> <u>disused parts of the command area.</u> *Photo by: Frank van Steenbergen.* 

<sup>&</sup>lt;sup>9</sup> Emdena however benefited from the availability of the ELWDP bulldozer in closing a large gully, that had rendered a large part of the area unserviceable for eight years.

<sup>&</sup>lt;sup>10</sup> The drought has also led to a situation in which the acute primary need of the project target group has shifted from animal health to alleviation of nutritional deficiencies. This is illustrated by farmers' reports that a set of healthy and well-fed oxen can prepare <sup>1</sup>/<sub>4</sub> ha of land a day, whereas the currently weak oxen take twice as long to do the same.

### B. Impact on Human Assets (scores 2-3)

101. Improvement of the educational status of men, women and children in the project area was not among project aims. Illiteracy among adults is widespread in Sheeb, and overage students are the norm. The good news is that school population seems to have increased consistently year after year since 1991, at the rate of 15%-20% per year. In 1997, the Mensheeb School had 628 students attending up to 7<sup>th</sup> grade, and in 2003 the number had gone up to 1237 students in Elementary and 334 in Middle School (up to 8<sup>th</sup> grade). It is calculated that there are over 2000 students in the Sheeb school system (Menshieb, Tiluk and Bises). The construction of the roads – including the dirt roads within the command area that were made as part of the project – has supported this positive general trend.

102. The most important impact on human assets concerns the increase in agricultural knowledge as a result of the agricultural and livestock development program. The extension program has fulfilled a definite need. Interviewed farmers recognized that access to agricultural information had improved through the training programs. In general, trained farmers had a positive attitude towards the extension personnel, the trainers and the training topics. Plant protection issues, horticulture and crop management (spacing, timing, etc.) in particular received high rankings. Farmers reported that their understanding of crop pests and diseases had improved and that they were now more aware of the importance of reporting to the extension services as soon as they detect new occurences of pests and diseases.

103. Trained farmers indicated that they had experimented with some of the suggestions and that they had passed on information that they found particularly useful to fellow farmers, in some cases organizing local debriefings. This was verified through interviews with untrained farmers. This points to a high demand for training. Topics of interest frequently mentioned were diversification into high value crops, ground water based agriculture and forage production. In a discussion organized on this issue, farmers mentioned that the training had to a reasonable extent matched their own priorities. The new "contact farmer" approach was not yet widely understood, but the the willingness to experiment with new techniques and crops is relatively high, as is the general trust in the expertise of the extension services.

104. In the Sheeb area, the farmers' attitudes towards the extension services and their advice seemed to have been positively influenced by the thorough consultation process set in motion under the IMT component. In that respect, many farmers expressed satisfaction with the meetings of the Local Project Steering Committee, which they perceive as an efficient channel of feedback from the extension services to their *ternafis*. The extension service personnel expressed the view that the meetings facilitated their understanding of farmers' current needs and their ability to tailor training to match local priorities.

105. Finally, the impact on human assets of the new main road – which was in the end not funded through ELWDP – and the local dirt roads (made to facilitate construction of the spate workds) has been considerable and has uniformly been assessed as positive. Travel time from Sheeb to the Massawa-Asmara highway has been reduced from three hours to less than an hour. It has allowed the safe transport of patients to clinics elsewhere, access to boarding schools; access to markets to buy and sell products, and to financial institutions in the cities; and easy conveyance to the highlands for sick people who cannot ride camels for three days. The impact on marketing has been considerable. The number of officially recorded shops and businesses in Mensheeb has also increased, from 28 in 1997 to 137 in 2003. Accessibility of the project area further improved with the dirt roads that were constructed by ELWDP as part of the construction of the civil works in Mai Ule and Wadi Laba.

### C. Impact on Social Capital and Empowerment (score 2)

106. In the project area there is considerable social capital in the shape of a well-arranged informal farmers organization, consisting of leaders of subcommand areas (*ternafis*) and tertiary units (*tashkils*) (see also Annexure 2). These unpaid leaders are also the main liaison between the government (in its agricultural programs) and the farming community; they organize the distribution of spate water, mobilize forces for maintenance and settle conflicts. Compared to spate irrigation systems elsewhere

there is a large measure of equity in the traditional organization in Sheeb. This is obvious from the different rules that are in place to distribute uneven quantities of spate flows relatively equitably and the clemency given to land users who are not able to contribute to the joint maintenance activities. The system of *ternafi* and *tashkil* is well-structured and works to solve conflicts in the system.

107. This indigeneous organization was not systematically engaged in the design and construction stage. While there was discussion and consultation with farmers in the early stages of the project, it was reportedly ad hoc and not formal. What was missing for a long time was a strategy to strengthen the farmers' organization and systematically and formally coming to an agreement on the main issues in design and implementation. Farmerr organizations are mentioned in the Socio-Economic Studies and Design Reports of 1997 and 1998, but no follow up was done. This was corrected from 2002 onwards, but by that time the farmers' confidence had been lost. Even today the general perception of the project among the general population is mixed, if not negative. In a drawing session that was organized among 45 sixth grade students in the Mensheeb High School as part of the evaluation, 32 assessed the impact of the project to be negative due to the loss of fertility and damage by mad floods.

### D. Impact on Food Security (score 1)

108. Though it is still early days, the impact on food security from the spate diversion– positive or negative - so far seems modest. There is no indication that a 'major' expansion of smallholder production of basic staples' has occurred. The impact of the extension and training program on livelihoods and food security is difficult to pin-point, because no formal follow-up or evaluation of adoption rates accompanied the program. Many of the activities moreover – such as the introduction of improved sorghum varieties by 118 farmers – started this year. Farmers interviewed who had participated in the trials were of the opinion that the crop looked promising, and all expected higher yields from the new varieties Similarly, the impact of the recently introduced cotton on 175 ha of farmers' land cannot yet be assessed. The increased productivity of the new sorghum varieties as experienced in the trials indicate that potential for future production increases are high, given that the varieties are broadly adopted. Also, diversification into high value commercial crops including for example vegetables may hold potential.

109. According to the medical staff in the Mensheeb Clinic: dietary habits have not improved in the past five years in Sheeb. The assessment of the staff at the Clinic is that people have less food than before and that low weight at birth is very common. The daily diet for infants, children and adults is very basic and consists of sorghum porridge with goat milk. Vegetables and meat are only consumed on special occasions.

110. Food aid continues to be important to the area. It is currently targeted at those without (irrigated) land; those who have few or no livestock; and nomads (*Rashaidas*). In 2003 the per capita monthly rations of wheat and lentils were increased from 8 kg of wheat to 10 kg, and lately to 12.5 kg per person; and from 600 grams of lentils to 800 grams per person; in addition to 600 gram of cooking oil per person.

### E. Impact on the Environment and Communal Resource Base (score 2-3)

111. The main impact on the environment relates to the tree cover in the area. The construction of the permanent spate headworks has reduced the requirement of trees used to build the traditional diversion structures. This is not a small impact: it is estimated that close to 28,000 acacia trees were cut each season in the Sheeb basin and transported over long distances by oxen. The availability of firewood and timber has been decreasing, as can be observed from the shift from brushwood houses to semi-stone houses. Therefore the project made a modest contribution (rank 2) to an important problem in Sheeb.

112. The loss of sediments and organic nutrients caught in the gravel trap is mentioned by farmers as an environmental problem of the project. No chemicals were used by farmers in the past because fields were fertilized with the flood sediments. At present, farmers interviewed suspect that nutrient requirements of their crops are no longer sufficiently satisfied by the floods. The same perception prevailed among children at the high school, in the drawing exercise. Some farmers even attribute limited grass growth for grazing to the interception of fine sediments. It was beyoind the scope of the evaluation investigate the validity of these claims. Although the sediment trap only intercepts a very small part of the fine silt, the evaluation is of the opinion that this issue should be monitored and discussed with farmers.

113. Another environmental concern particular to the area is the quality of drinking water, particularly the nitrate content. Nitrate is harmful to young children and can lead to cyanosis. Research also points to oncogenic effects. The existing de-nitration methods are very expensive and depend on high technology; the best solution would be to find a nitrate-free source. This has unfortunately not happened so far and the project has not had a positive impact here.



Photo 6: <u>Drawing from high school drawing exercise</u>: large part of children suspect that water from spate has lost its fertility – even though this is difficult to substantiate.

### F. Impact on Institutions, Policies and the Regulatory Framework (score 2)

114. The impact of ELWDP in capacity building at the MOA has been described in Section IV-B. This was one of two project objectives, but it suffered from a lack of human resources within the MOA.

115. The missing part in the field of institutional development however was the development of a farmers' organization. This backlog in this area was strategy, which has recouped in recent years. Preparations have been made for the Sheeb Farmers' Association and its structure and rules, described in the draft Constitution (in particular the water charge), have been discussed extensively. Once in place the Association may expand its activities to input supply and water distribution in the command area.

116. Impact on regulatory frameworks was not an objective of the project and cannot be assessed. The project was meant to be a pilot and as such holds the potential of influencing spate policy dialogue in the future.

### G. Impact on Gender (score 2)

117. No gender strategy was part of the project design although women are active farmers. Focus group interviews with women in Ide Abay, Tiluk and Emdena revealed that approximately 75% of women are engaged in agricultural activities such as harvesting, threshing, and transporting grains and fodder. Estimates vary but approximately 35% of women in the villages are widows or heads of households, in which case they have the same responsibilities as male farmers. There are even women *tashkils* performing water management tasks in their tertiary units. In addition a small proportion of

adult women is involved in petty trade and women are active members in the village *Baito*<sup>11</sup> (people's assembly, community-based link with the local village and administration), and as participants in community development programs and politics.

118. The lack of a gender strategy in the project means that opportunities have been missed to increase project impact and to balance gender relations. In spite of widespread illiteracy, women are avid for training in home economics, animal health, crop diversification and handicrafts. The annual movement to the highlands and the rebuilding of the temporary houses (*'agnet'*) is a large drain on resources and demand is for income-generating skills. The few special training programs that were organized were well received. One special training session for the women was arranged by the agricultural extension services, and led to many requests for more.

119. The one component that could have made a significant difference to women, the drinking water component, did not come off the ground. Long hauling times continue, particularly for women and girls in outlying villages. In Emdena and Bises every day two 2-hour journeys by foot/donkey are common. Two developments have however mitigated the effort of collecting water – the construction of dirt roads by the project throughout the project area and the concentration of residences in Mensheeb Town.

### H. Sustainability (score 3)

120. It may be argued that ELWDP has consolidated spate irrigation in Wadi Laba and Mai Ule. The maintenance of the *agims* and *misghas* in the past required substantial human and animal labor, large numbers of trees and considerable time. In particular, the availability of trees had become precarious. Hauling time has increased significantly (one estimate is five times over the last ten years). There is no easy substitute for these acacia trees; the interlocking of their fine branches makes it an ideal material to protect the *agims* from erosion and scouring.



Photo 7: The pre-project system of repair relied heavily on acacia brushwood, which was becoming increasingly difficult to collect – threatening the sustainability of the traditional system. Photo by: Frank van Steenbergen.

121. Another threat to the sustainability of the traditional method of spate irrigation is the availability of draught animals. During bad years spate irrigation farmers encounter serious cash deficits. According to farmers interviewed in such years even saving seeds for the next planting season becomes difficult. In the absence of off-farm employment opportunities and local credit organizations, selling draught animals and other livestock is a common safety net, but it also reduces

<sup>&</sup>lt;sup>11</sup> The government of Eritrea has passed legislation that at least 15% of the seats of village 'Baito' must be occupied by women.

the capacity to restore the traditional diversion structures. Even before ELWDP, the local government had made subsidized bulldozer time available to these farmersduring such periods.

122. By constructing permanent diversion structures these vulnerabilities and threats have reduced. The main question that remains however is the capacity of the communities, particularly the Sheeb Farmers Association, to maintain the diversion structures. Substantial social capital seems to be in place (see 5C), but it is too soon to judge. Further training is needed for farmers to administer the project (collect fees, contract services, pay workers, pay O&M costs), enforce water irrigation rights, and manage the project headworks and command area structures. At the time of the evaluation the Association was not yet formally established nor given management responsibility. The challenges it faces are:

- Fine-tuning the management of the system, such as the operation of the breaching bund and the cleaning of the sedimentation pond
- Management of earth-moving equipment, and
- Generation of sufficient income in bad years as well.

123. A recent estimate of annual operation and maintenance costs per hectare is Nfk 530/ha. This estimate includes a large reservation (more than 50%) for the cleaning of the sedimentation ponds. A more detailed discussion of this, presented in Annexure 2, indicates that this may neither be practically possible nor entirely necessary and that recurrent costs therefore could be lower. The Sheeb Farmer Association Constitution proposes an initial contribution of Nfk 400/ha, which should suffice. In the various focus group interviews in the project area this amount – though not small -- was widely known and generally accepted. It is in fact of the same order of magnitude as the traditional cost of maintenance. The main challenge however will be the collection of sufficient resources in a catastrophic year such as 2002, when there is substantial damage and no crop.

124. Besides the sustainability of the spate irrigation components, there is the future of the various improvements in agriculture and livestock to consider. With respect to the introduced sorghum varieties, sustainability will depend on the ability to secure adequate seed multiplication by farmers, which may require more work. The implementation of the contact farmer approach should facilitate this development. With respect to the introduction of cotton, much will depend on the markets – whether they will compensate for the higher labour and pesticide inputs required. The introduction of cash crops is still very new and seems to require more hand-holding. While the CAHW concept has proven very popular, the sustainability depends on a continuity of the input supply, training and renumerations – either by MOA or in other ways.

### I. Innovation and Replicability/Scaling Up (score 3)

125. ELDWP was meant to be a pilot project in spate irrigation development in Eritrea. At this point in time, it may be too early to judge whether the engineering works are likely to be replicated on a large scale. In general, the evaluation recognizes the potential for spate irrigation in Eritrea as an appropriate strategy for water resource development. A main lesson from ELDWP is that attention should also be given to low cost approaches, do-able maintenance and to linking investment with likelihood of irrigation and realistic impact. In doing so several approaches should be considered and each area may have its own best mix. In some areas (Mai Ule is an example) civil head works may not be practical but other approaches may do well – improved traction and earthmoving power, smaller downstream deflections. In other areas of Eritrea, i.e. the Western Lowlands, relatively small systems have performed reasonably well. Not every approach is suitable everywhere, but there is a large number of measures (including the promotion of new crops, livestock support, soil bunding) that can increase the productivity of spate irrigation in Eritrea. The rating for innovation and potential scope of replication of some of the project approaches and activities is substantial.

126. Several 'home-grown' elements of ELWDP classify as innovations worthy of replication, both in the country and elsewhere – in particular the farmer-government interaction through the local steering committee, the farmer-management of a spate system of this size, the paravet program and some of the elements of the command area works. In the latter case the collaboration between

engineers and informed leaders has resulted in new innovative designs. The Sheeb systems may be considered exemplary for good water management and crop husbandry - the high sorghum yields are testimony of this. The MOA has already capitalized on this and is organizing farmer-to-farmer visits, taking farmers from new spate areas in the Western Lowlands to Sheeb.

### J. Other Poverty Impact (score 3)

127. The main other poverty impact is the impact that the investments have had on the local economy. The investment in the ELWDP and the construction of the road created job opportunities in construction and in the local service sector. It was not possible to quantify these as part of this evaluation. Though a large part of the work depended on outside labour and on machinery – with the income largely exported out of the Sheeb area - components such as the gabion works used considerable amounts of local labour. The activities started under ELWDP have also created a number of new job opportunities – such as the paravets and some of the locally trained maintenance staff. There is no indication of job opportunities negatively affected by the project. The rating of project impact on job opportunities is classified as substantial.

### K. Overall Impact Assessment (score 2)

128. In summary, the overall impact of ELWDP on poverty alleviation is mixed – with both positive and negative elements. The Sheeb area has developed significantly in the past ten years, but much of this is due to the improved road, which was largely constructed without ELWDP funding. The main achievement of ELWDP is that it has stabilized the spate resource use system in Sheeb. The current infrastructure has relieved the threat of the system collapsing because of the non-availability of suitable brushwood. The current design however depends on breaching bunds, which as yet do not function well and may cause either loss of flood water or the release of flood surges. The impact of the spate improvement on crop production or food security is as yet not visible. The activities in the agricultural program have had positive results on the health of livestock (a very critical household asset) and on farming practices. Also, the new improved sorghum varieties have potential for production increases. The future impact will however depend on a successful implementation of the activities recommended for the floow-on phse of the project. The overall impact of the project is thus ranked as modest (2) at present, but with potential to become substantial.

### VI. PERFORMANCE OF PARTNERS

129. Progress in the initial years of the project was slow, even before war broke out between Eritrea and Ethiopia, and came to a standstill later, with the war. The slow initial progress is related to the understaffing in the MOA and several loose ends in the SAR (see also next section). Given the changes in the early part of the project (in the drinking water component, spate component and roads component) and the fact that most components had to go through a process of conceptualization, design, institutional development and construction, it is not surprising that deadlines were not met. However, after the project restarted much was achieved in the last four years for which the MOA and also IFAD and IDA can take credit.

### A. Performance of IFAD (score 3)

130. The implementation logic of an irrigation investment of this size forced all implementing agencies for a long time to focus more on the engineering aspects of the project than on the supporting components. Contractual and technical issues dominated much of the agenda in 2000-2001, when the priority was the civil works construction. Yet IFAD must be commended for its initiative to place greater emphasis on the IMT and Crop and Livestock Components after 2001 by fielding consultants from its trust funds to formulate programs in this area. Earlier the Agricultural and Livestock component in particular were implemented through the routine operations of the MOA, which gave them less visibility even when their impact potential was high. The ELWDP contribution was practically in the nature of budget support.

131. There are three weak areas in IFAD's performance. The first is the availability of basic financial data and the lack of data on project impact. This is a shortcoming for which all three partners

share responsibility —IFAD, the MOA and IDA, even though formally this is the task of the recipient organization. The financial system that was set up differentiates per cost item and not per project activity. It has hence been difficult to get a consolidated overview of expenditures against different components. This makes it hard to assess the cost effectiveness and adjust budgetary priorities accordingly. Financial management seems to have been handled at audit report and procurement procedure level, but less so at overall program impact effectiveness level.

132. Similarly, monitoring and evaluation never took shape, making it hard to define or steer impact related priorities in a multi-component program such as ELWDP. In ELWDP the responsibility for monitoring and evaluation – as in financial administration - was formally with the Borrower. For an implementing organization (particular one faced with the post-conflict constraints) other priorities however will always prevail<sup>12</sup>. The question may be asked whether the strategy of placing the responsibility for monitoring with project management is sensible, as project management usually has to look after implementation matters that generally tend to have a higher degree of urgency. As a Lender, IFAD may be proactive in putting in place monitoring and feedback mechanisms. The argument of the Lender taking initiative extends to the financial systems. There is a basic inconsistency between the understaffed and lowly-paid financial administrative capacity in the MOA and the disproportionably well-funded supervision arrangements by IDA and IFAD. A lending organization such as IFAD may moreover be expected to have a comparative advantage and broad experience in setting up effective financial systems or adequate monitoring arrangements.

133. The second weak area in IFAD's performance is the relation with UNICEF. The MoU with UNICEF was rather loose, only obliging UNICEF to carry out the agreed activities with due diligence and efficiency and without provision for supervision by IFAD. In the words of one resource person within IFAD "UNICEF did not want to be supervised". However, this raises a larger question of interagency partnership and relations. The procurement of large amounts of equipment through UNICEF's procurement procedures was not in line with the recommendations by IFAD's supervision mission in 1997. In this supervision mission it was recommended that tenders should be floated for both procurement and construction services and the selected tenderer should be fully responsible for the execution of works. Subsequently, the 1998 supervision mission advised against procuring material, if funding for the construction and installation of the drinking water systems was not assured. Yet the procurement went ahead. Also at no stage so it seems was IFAD able to correct UNICEF's inadequate capacity to supervise the drinking water component themselves. The MOU with UNICEF of April 1995 suggest that UNICEF has the entire responsibility for the component this appears in practice to have meant that UNICEF was able to get away with ignoring IFAD's recommendations, even when addressed by IFAD at UNICEF head quarters level. This area of weakness concerns problematic interagency relations and not the individual performance of operational staff. The third weak area concerns too optimistic assumptions in the design on government capacity to implmenet and on likely project impact. The overall rating is (3).

### **B. Performance of the Co-operating Institution (score 4)**

134. IDA was invited by IFAD to supervise ELWDP because of the large civil works content of the project, for which IDA staff capabilities and procurement procedures were more appropriate than that of UNOPS – which is engaged by IFAD as the cooperating party in other projects. IDA receives an annual sum (USD 120 000) for these services. It hired both external expertise and engaged its own staff for supervision.

135. Since the project was initiated IDA undertook two supervision missions annually to ELWDP with the exception of the 1998-1999 periods, when the project was suspended. The emphasis in the earlier supervision missions was on getting ELWDP going, i.e. establishing project management (including monitoring) capacity within the MOA. Contrary to the arrangements proposed in the SAR, the IDA supervision mission at an early stage pushed the issue of engaging an international

<sup>&</sup>lt;sup>12</sup> For instance, consideration was given to field a consultant to help MOA prepare a baseline survey and arrange the collection of data on impact in 2002. However, following the August 2002 events, it was decided that this issue would not be high on people's agenda at Sheeb and arrangements were only developed during the autumn of 2003.

engineering firm to prepare the designs. Given the limited capacity within the MOA and the limited experience with civil works of this nature, this was a sensible step.

136. In this early period farmer's participation was not an issue. Rather, the supervision missions pushed for an "accelerated implementation plan". The 'technical' composition of the engineering team (based on terms-of-reference prepared during an IDA supervision mission) reflected the same. This orientation changed substantially after the project was restarted in 2000. There was much emphasis in the supervision missions – and to a good effect - on encouraging farmers' involvement in the command area works, creating an effective farmers association, and regaining trust in the aftermath of the 2002 flood. Supervision reports were timel, of high quality and follow up on previous recommendations satisfactory.

137. As far as can be judged procurement in the components supervised by IDA was handled smoothly. When the road component was being implemented, IDA rejected reimbursement of contracts that were issued without their approval. In general clearance was given in a timely manner. The limitations of the financial administration have been discussed above. The overall rating is therefore high (4).

### C. Government and its Agencies (including project management) (score 3)

138. Throughout the project the GOE suffered from the inability to make sufficient staff available. Even so, the components that were agreed after the budget reallocations have all by and large been implemented, most of it in the period 2000-2004. Given the limited human resources, this is a considerable achievement.

139. During the first years of the project, project management suffered from the absence of a central, full time project coordinator. The responsibility for management was shifted several times. At the planning stage, the responsibility for management was under the Planning and Statistics Unit before being moved to the Survey and Design Division during the design phase of the project. After design was completed, management responsibility moved to the Irrigation and Soil Conservation Division. The responsibility of program management was additional to the regular MOA activities, and consequently the project suffered from weak follow-up on day-to-day activities, and failure to deliver reports in a timely manner. With the recruitment of a Project Coordinator in 2000, project management was considerably strengthened and much lost time was made up. This has been achieved with a relatively small team. Also in the recent year farmer's participation has become well-structured and effective.

140. What never took off, however, is the monitoring of the project impact – in spite of resources dedicated for this in the SAR and in spite of frequent reminders of supervision missions. Similarly, the financial administration remained problematic. The socio-economist hired in 1996 to prepare a pre-project Socio-economic Study and Baseline Survey left the project before finalising the survey. When the project restarted in 2000, it was agreed that MOA would recruit a local short-term consultant to review the surveys and studies carried out and develop the baseline indicators. Also it was agreed that subsequent monitoring would be carried out on a contractual basis starting in mid-2002. The latest effort at defining indicators was delivered in September 2003, but it lacks a plan of implementation and so far lacks follow-up.

141. Monitoring in the drinking water sector is equally weak. First WRD and later MOLG suffered from the absence of well-established systems to implement this component. WRD maintains a national data base, but has no identification codes for the separate water points, for instance. In MOLG the regular rotation (two years) of staff at the lowest level is problematic.

142. The project foresaw in the national Steering Committee, but in the latter part of the project a local Steering Committee was added – that developed into an effective forum to discuss and plan ELWDP activities. Summing above the above points, the overall rating is substantial (3).



**Photo 8: The Local Steering Committee Meetings have developed into an effective mechanism for project coordination** – and involve project management and farmer leaders. *Photo by: Frank van Steenbergen*.

### D. Performance of Non-Governmental and Community Based-Organizations (score 1)

143. UNICEF implemented the drinking water component and in the words of the agreement signed between IFAD and UNICEF Headquarters on 17 April 1995, was "provided with the proceeds of the grant, deposited by BSF". In other words UNICEF had the entire responsibility for the component. The agreement further specifies that UNICEF would receive the funding for execution with the Ministry of Energy, Mines and Water. UNICEF could charge an overhead equivalent to 5.7% of the component costs.

144. In this role a number of things went wrong:

- The assessment of water availability in the Wadi Laba gorge in the GEDECC feasibility report was erroneous, but this error was not detected until very late in the project implementation process.
- The water supply design concept of the SAR (improving local wells) was substituted for one with centralized systems without giving due consideration to the cost complications and available budget in ELWDP. The design concept moreover was changed several times (see annexure 3). This caused delays and confusion.
- Material was procured for the Mensheeb water supply without an assured contract for its construction.
- In general hydrological investigation has been poor. The high nitrate levels though not uncommon in Eritrea were never properly investigated and it surfaced as a major issue only in 2003. It still is not investigated for Ghadim Halib or Ghedget.

145. The main issue is that the role of UNICEF combines a confusion of functions, which becomes apparent when things go wrong. UNICEF undertook supervision and made technical expertise available but it also controlled funds and assumed responsibility in management and implementation. The WRD and later the MOLG similarly are responsible in management and implementation and it is difficult to define where the role of UNICEF stops and that of MOLG begins. The UNICEF's Progress Report of 1998 for instance states that "the MOLG will serve as project owner and supervisor / inspector" – which begs the question, what is the role of UNICEF in this matter? In hindsight it would be have been better to define the role of UNICEF in specialized supervision only, similar to the role of IDA. As a consequence IFAD was thrust into a more or less a direct supervision role, fielding a number of missions in 1997-1998 and then again in 2001. On some occasions the exchange between IFAD and UNICEF was prickly. There was little response by UNICEF to the issues raised in these IFAD missions or the response was very defensive. This was the case with the

mission fielded by UNICEF in response to the highly critical 2001 IFAD mission. The UNICEF mission reiterated that there would be reliable water supply from the Wadi Laba source without having any evidence in this respect (see also annex II).

146. Even on supervision one may in future question whether or not other more effective and costefficient alternatives exist than UNICEF. In ELWDP, UNICEF's performance in supervision was very weak, as is clear from the frequently changing design concepts, the lack of quality supervision of fieldwork, absence of standard practices for hydro-geological investigations, and the many inaccuracies in the commissioned designs. Based on the above the rating is low (1).

### **E. Performance of Co-financiers (score 3)**

147. Co-financing for ELWDP was provided by BSF. BSF's contribution related to a number of distinct components, i.e. the road component, the agricultural and livestock component and the drinking water component. In this respect ELWDP was unusual, though not exceptional, in that under the Joint Program with IFAD, BSF usually funds social sector components, and usually not roads and agricultural development. Interestingly the impact of the latter two components was better than the social components.

148. Under the Joint Program BSF has transferred the responsibility of spending and administring its two grants (BF-13 and BF-14) to IFAD. By and large BSF's role appears to have come into play particularly when there were requests for extension or reallocations. On the occasion of the last extension for instance BSF voiced a strong concern about the lack of a dedicated financial administrator in the project, and complained it had not been kept up-to-date on the project. This could have been circumvented by a more active presence of BSF in the supervision missions. In the early years BSF fielded a person to two of the first supervision missions, but later its participation in these missions was limited. Engagement was by staff posted at different new field delegations or seconded to IFAD under the Joint Program, which makes continuity and follow-up more difficult. One may ask whether it would not serve BSF better to directly finance and more intensely supervise project components – under a joint financing arrangement. Another and opposite alternative would be to relax its direct involvement, provide program financing of IFAD, leaving all discretion on project spending with IFAD.

### VII. OVERALL ASSESSMENT AND CONCLUSIONS

149. The overall performance of ELWDP – when assessed against the objectives in the SAR – is modest. However, the evaluation assesses that if the activities proposed during the extension are carried out and if a wide adoption of the improved sorghum varieties takes place, the potential for the future impact of ELDWP may be higher.

150. As described in section IV, several components initially planned could not be taken up or completed, such as the Wadi Labka spate works, the road component and the drinking water component. Based on the information in section V, the overall assessment of this evaluation also rates the impact of ELWDP on rural poverty alleviation as modest. Explanation for the modest ranking is found both in:

- Inaccurate assumptions at project design, and
- Implementation difficulties.

### Inaccurate assumptions at project design

151. The project design as described in the SAR suffered from optimistic assumptions on government implementation capacity, from budget underestimates coupled with limited contingencies and from an optimistic assessment of project impact.

### Optimistic assumptions on government implementation capacity.

152. After lengthy discussions and negotiations with the GoE it was agreed that most of the ELWDP components would be implemented in-house by the GoE. The spate irrigation component for instance was to be designed by MOA staff and implemented on force account. Very soon in the project this

had to be corrected, if only because the required number of people were not available to undertake the tasks at hand. Time was lost in adjustment and budget estimates had to adjusted upwards as well (see below). Similarly, in the drinking water component there was unrealistic expectation of the capacity of the WRD, to which was attributed the slow start.

### Budget underestimates and limited contingencies.

153. Many cost estimates in the SAR in hindsight were too low. In the spate component and drinking water component different designs were used, which increased the cost. In the road component the expenses required for the feeder road were grossly underestimated. As a result the scope of ELWDP was narrowed down, but often after considerable preparatory work. The consequence of the budget shortfall in the drinking water component was that project funds in the end only paid for an extensive feasibility and design study and the procurement of material for one system, but no effective water supply on the ground developed. The problem of budget underestimates were made worse because there were limited contingencies within the ELWDP budget. The consequent strategy was to cover shortfalls in one component by reducing the range of activities in another component.

154. These issues raise the question of how much preparation should be done prior to a project and how much within and if so how much financial contingency should be left. A large part of 1994 was spent on the preparation of the SAR and the different components suggests a large degree of preciseness. It seems that ELWDP was on the one hand designed in much detail, whereas there were still many unknowns. As a result the contingencies to accommodate budget shortfalls was very limited and financial reserves had to be found in cancelling some other components. There is a real hazard here because in the end not objective priorities but financial commitments start determining the course of events. In the case of ELWDP, finishing the costly headworks for instance became the highest priority because they could not be left mid air. Once the SAR was approved in fact the feasibility of the spate improvements was never a point of discussion. Instead the agriculture and livestock component was used as small change and was put on hold, even though its potential effect on agricultural productivity was high.

### Optimistic estimates of project impact.

155. A questionable assumption in the SAR was the expected impact of the improved spate diversion structures. The average area under cultivation was to increase from 30 to 70%, whereas crop yields would increase by 150%. It may not be fair to judge any project implementation by such optimistic standards. As far as is possible to assess after two years of operation the difference in agricultural production is small. In fact the main benefit ascribed to the new structures is the drastically reduced maintenance burden, which, because of the shortage of acacia trees, would have become increasingly problematic. The inflated estimates of project impact, however, justify an intervention that may not be the most appropriate. The IDA review of January 2003 for instance asks if this type of investment in spate irrigation is economically justified. Increasing agricultural productivity in Eritrea by improving spate irrigation is still relevant, but the high cost route chosen in the SAR of ELWDP is probably not the best model for a number of reasons. The project attempts to improve a relatively well functioning traditional system, hence the impact will always be limited. The production increases projected in the SAR appear to be used to justify the standard engineering solution and block the creativity that is required in searching for solutions that have a higher value for money.

### Implementation difficulties

156. The implementation of ELWDP suffered from inadequate staffing by the MOA, inadequate supervision arrangements in the drinking water component and insufficient attention to farmers' participation at the early stages.

### Inadequate staffing:

157. There was a persistent numerical capacity constraint within the MOA. The Ministry has been severely understaffed. Implementation in the first years of the project suffered, because to begin with

MOA was not able to make a full-time project coordinator available, in spite of this being a precondition in the Loan Agreement. Neither could local socio-economists be recruited. As a result progress delays occurred and the establishment of a monitoring system received low priority. The assumptions of the MOA driving the design process and works implementation on force account basis were unrealistic. Also, the plans of strengthening MOA capacity in developing spate systems of this nature could not materialize, as there was no staff to second the international experts. The numerical capacity problem continues to be unresolved today. It is important to note that the inadequacy is in terms of numbers; the quality and commitment of staff is high. This in particular explains the achievements made in the last four years.

### Inadequate supervision of the drinking water component.

158. A second problem in implementation was the drinking water component (see annexure 3), which has been largely unguided. It suffered from unresolved ambiguities on the role of UNICEF, the shifting responsibilities for drinking water supply within the GOE and unfortunate and unnoticed errors on the part of the consultancy that undertook the feasibility studies. The initial assumption of the project was that improved drinking water supply was an essential complement to the development of the Sheeb and Wadi Labka spate system, as it would encourage permanent settlement. The question is whether this argument is valid. Even though drinking water is the most pressing need in the area, it is debatable whether it is the only reason for people to migrate in the summer.

### Farmers' participation.

159. A third area of weakness was farmers' participation. Whereas there was discussion and consultation with farmers in the design stages of the project, what was missing for a long time was a strategy for strengthening the farmers organization and systematically and formally agreeing on the main issues in design and implementation. This was all the more important as farmers are expected to continue to manage the system. What should have taken place from the onset in the words of one of the farmers interviewed: "Work together with farmers on the design, and decide together. Before starting the civil works, ensure an organization (and byelaws) of beneficiaries is in place. Also, carry out consultations with farmers and their leaders who have indigenous knowledge of traditional structures. Be open to criticism. Learn from farmers and teach farmers the advantages of modern technology."

160. Systematic farmers' participation took off when a full-time coordinator was in place, the local team in Sheeb was strengthened, and the IMT and CAD subcomponents began to take shape. The work performed by the project team with the assistance of the consultants to reestablish farmers' trust in the project after the 'mad flood' of 2002, must be commended and supported. The project is at present engaged in a well-structured participatory process, systematically engaging the traditional organization of *ternafis* and *tashkils*. The local steering committee meetings, in which all players – project staff, local government and farmer leaders - equally take part in work planning can easily rate as a best practice. The CAD works and the command area bulldozer operations are similarly implemented with due consultation and engagement of the traditional farmer leadership and much ground has been gained in preparing the Sheeb Farmer Association.

161. Despite all the shortcomings, it should be remembered that for a large part of the project duration ELWDP has been implemented under unusual circumstances – of post conflict, conflict and then again post conflict. This had a number of consequences for the project – no track record to build on, difficulty in making an adequate initial assessment of implementing capability, change in project staff, demobilization of consultants, cancellation of tenders and a shortage of skilled junior staff due to the ongoing mobilization (which continues into the present).

### VIII. RECOMMENDATIONS AND INSIGHTS

162. This section brings together recommendations and insights of this evaluation. The first part summarizes recommendations that relate to the immediate future of the project. In the view of the evaluation mission ELWDP is still unfinished and would require an extension to mid-2006. Infrastructural investments are largely completed, but adequate time should be allowed for the irrigation management transfer, command area development, extension and training subcomponents

to come to their logical conclusion. Most of these activities have only taken shape after 2000 (or even later) and can only be programmed during the six-month interval when farmers return from the highlands. The second part of this section concludes the report with general insights on the implementation of projects of this nature.

### Immediate recommendations

Recommendation 1: Extend the project's closing date to mid 2006

163. The following recommendations imply an extension of ELWDP beyond December 2004, preferably to mid 2006 (to capture the 2004-2005 and 2005-2006 seasons). The extension should be relatively low-disbursement and high-management. Project supervision arrangement would need to be adjusted to lower the cost and would mainly take the shape of technical backstopping of the different components.

Recommendation 2: Field an expert in financial management

164. The main purpose of financial management and monitoring is to manage, steer and adjust project activities. While justifying them retroactively is of extreme importance, these tools could also be of managerial importance. Though there is no doubt that at audit level finances have been properly managed and spendings can be justified, the current input based financial systems could be improved in order to allow for a more strategic use of project financial resources. Knowledge in financial administration of all categories as well as components should be transferred to the project staff and continous backstopping be provided, if needed.

Recommendation 3: Extend support to the Sheeb Farmer Association

165. The project has made up for time lost and is at present engaged in a well-structured participatory process. All project decisions are now discussed in the local steering committee meetings, in which project staff, local government and farmer leaders equally take part. In addition, the Sheeb Farmer Association is finally on its way. Yet the responsibilities that are vested in it are large and management transfer is yet to start. The recommendation is for IFAD and MOA to ensure support to the Sheeb Farmer Association beyond the current closing date – preferably in such a way as to capture two more farming seasons.

166. The continuation of an irrigation management transfer subcomponent may consist of the development of agreement on responsibilities for O&M of headworks to be apportioned to farmers and to MOA; finalization and administration of an agreed O&M budget, collection of fees; training in various fields of system management (accounting, hiring staff, etc); operation of earth moving equipment and joint evaluations of operation.

Recommendation 4: Joint review of spate irrigation works by MOA, Sheeb Farmers Association and external expertise

167. There are two areas of special concern in the operation of the new system: the breaching bunds and the sedimentation ponds. There are doubts as to whether the bunds in the current design can accommodate the flood peaks they were designed to control – especially in Mai Ule. In the view of the evaluation mission the breaching bunds are the weak spot in the current design and represent a substantial liability and risk. Farmers, moreover, wanting to avoid breaching bund collapse, have been asking for the bunds to be raised. This could lead to a new disaster scenario, if the reinforced bunds (or settled bunds) break late in high floods. The urgent recommendation is for the design and operation of the bunds to be jointly reviewed by MOA and Sheeb Farmers Association with the help of external expert support. One of the options to be looked at is the forced breaching of the bunds in times of high floods by making cuts in the bund, as is done in soil bunds elsewhere in the world.

168. The review should extend to the sedimentation ponds. The ponds now also trap finer sediment, causing it to fill rapidly and to possibly intercept fine silts in the early part of the flood season which otherwise would improve soil fertility. In Wadi Laba the operation of the sedimentation pond is linked to the functioning of the Sheeb Kateen culvert, which has been performing below expectation as well.

The operation procedures of the sedimentation pond may need to be revisited - so as to also reduce cost of operations.

Recommendation 5: Discuss improved water distribution as part of the CAD subcomponent

169. Under the CAD works the emphasis so far has been on distribution structures. The participatory process followed in the last year has been instrumental in establishing effective communication between farmers and ELWDP and in identifying innovative designs. To build on this it is recommended that the MOA field staff and the Sheeb Farmers Association extend the CAD program to a review and discussion of the rules of water distribution, as they are applied within the command area. This should also address the supply of water to tail end/ overflow areas, without direct *mishgas*.

Recommendation 6: Continue and broaden scope of the agricultural extension component

170. The increased collaboration between contact farmers, extensionists and researchers, set in motion in the last year, has excellent potential. Particularly as there is a well-established practice of dissemination of extension messages within communities, it is recommended that MOA continues with this activity. To enhance the performance of the contact farmers in particular, there is need to link them structurally to the frontline extension, and more importantly to the back-up provided by the sub-zoba/zoba subject matter specialists, and to field research. A major training/skills development program for both research and extension personnel and improving linkages between research and extension should be considered.

171. The component should broaden its scope to priorities identified in the needs assessment undertaken by the EAs, such as ground water irrigated horticulture (using low cost tube wells) and forage and feed production (drought resistant grasses and fast growing species and cultivars of fodder plants). Diversification into high value commercial crops including for example vegetables, watermelons and chilies may also hold potential. In the training and extension program, special care is needed to reach and engage female farmers – by tailoring training to women farmers' priorities or engaging female contact farmers, for instance. To boost the entire agricultural and livestock component and to prevent it from becoming a side-show, it would be necessary to adequately resource it with senior capacity as planned to assist the EAs.

Recommendation 7: Establish paravet associations

172. The CAHW programme is of high relevance to farmers. However, in spite of its success there are questions on the sustainability of the paravet program and the continued availability of drugs at the local level, if ELWDP would cease to exist. It is recommended that local paravet associations are supported by ELWDP and MOA. Such associations could arrange the supply of drugs from the MOA animal health clinics and coordinate training needs (on priorities such as fodder production and nutritional deficiencies). It may be worth considering whether the Sheeb Farmers Association could handle the procurement/supply of drugs to the paravets. With regards to training, it is recommended that further training needs among the paravets (refresher courses or upgrading types of training) should be identified and provided.

Recommendation 8: Utilize stored material of the drinking water component

173. The material for the drinking water component that was procured in 1999/2000 is still unutilized. There is still ambiguity as to what part of it will be used in the proposed Cooperazione Italiana funded drinking water systems in Sheeb. It is recommended that UNICEF and MOLG update the inventory of stored material and prepare a plan on where to utilize it, in Sheeb or elsewhere in the country.

Recommendation 9: Undertake water quality survey

174. Doubts on the suitability of the various water resources in Sheeb and Wadi Labka have led to frequent changes in the conceptualization of the drinking water component. As a result even with the support of Cooperazione Italiana there is no certainty about the supply of safe drinking water in the area.

175. During the implementation of the project there has, however, not been a water quality survey that covered all wells and known sources. It is recommended that MOLG/UNICEF commission such a comprehensive inventory. The balance fund from IFAD/BSF may be used for such a purpose but all that is required is simple factfinding - not elaborate investigations on causes and history. The survey should be shared with the health workers in the area. It may also be extended to the salinity and sodicity parameters, that affect crop production.

### General Insights

176. In addition to the immediate recommendations, there are a number of lessons and insights that relate to the implementation of ELWDP.

## Recommendation 10: Limit the number of project components and provide a clearer focus, particularly in conflict and post conflict situations

177. Because of the post-conflict uncertainties in 1994 and 1995, the SAR advocated a 'simple' approach. Even so, ELWDP in the end consisted of several components, all of which were supposed to contribute and reinforce one another. In the implementation of the project, however, synergy between the different components was modest. Instead budgets of one component became contingency for another component. The most capital intensive component in particular, the spate irrigation improvement, received the major share of project management and supervision time – regardless of its possible impact. In comparison, other components were relatively ignored. It is recommended that in future projects of this nature IFAD tries to provide a stronger single focus, taking cognizance that in a package that combines capital intensive and low investment measures, the latter may get low priority. It is also recommended in post-conflict situations, as existed in Eritrea in 1995 and again in 2000, due attention is given to components that quickly rectify immediate resource constraints – such as the supply of draught animals or bulldozers for earth works. Now in these periods much emphasis went to long gestation activities (complex civil works and sorghum trials).

## Recommendation 11: Initiate monitoring mechanisms and activity-based budgeting at an early stage in the project

178. It is recommended that monitoring and activity-based budgeting procedures are put in place at a very early stage of project implementation. IFAD as a funding agency may take responsibility in this regard rather than assuming that it will be done by a usually overburdened project management. In setting up monitoring systems, the preference should be for simple and clearly defined indicators, which provide feedback as to whether the different project components are on-track and are relevant. Several such systems exist these days, where the ability of monitoring to quickly produce indicators of impact – either through simple tracer parameters or through consumer satisfaction surveys – is valued over comprehensiveness.

Recommendation 12: Consider alternative implementation capacity strategies in Eritrea

179. Capacity constraints were a running theme in the implementation of ELWDP. It necessitated a reformulation of modalities in the early stage of the project. It also affected the execution of some of the project components, as it was difficult to recruit staff on government renumeration packages. It is recommended that the MOA in future projects considers alternative capacity strategies. This could take the form of engaging staff on private sector contracts rather than as employees of the MOA. Another strategy is to more actively engage, where possible, local persons on part-payment basis – following the example of the successful paravet program

Recommendation 13: Systematically structure farmer participation from the onset of the project.

180. Farmer management and farmer participation should be given the central place in the implementation of projects such as ELWDP. This should be done in a systematic manner. In the *ternafi* workshop and the focus group discussions farmers formulated their recommendations for future projects as follows:

- more formal and structured consultation
- rethinking of design parameters
- an earlier start to the establishment of the farmers associations.

Recommendation 14: Revisit the approach to spate irrigation development

181. It is recommended that the approach to spate irrigation, followed under ELWDP, is revisited in future projects of MOA or IFAD. The civil engineering approach in ELWDP followed what in 1995 was thought to be the best approach. Yet the structures came at high costs and their impact in terms of increased crop production is still unproven. The overall functionality and cost efficiency of elements such as the sedimentation pond, breaching bund, culverts, off-take canal, and command area structures need to be reassessed. It is recommended that in spate irrigation development in Eritrea a broad range of options be considered and that improving or supporting spate irrigation not be automatically equated with the development of civil works, particularly not the top range solutions that were adopted in Wadi Laba and Mai Ule.

182. Moreover, in many locations the headworks may be technically difficult, economically not viable, and difficult to manage. In these areas the provision of bulldozers on paid or even commercial rates; the improvement in command areas networks and water distribution; the development of spate systems on smaller tributaries; the use of low-cost technology to strengthen traditional diversions; the introduction of improved draught animals, and the development of high value cropping patterns may all be better value-for-money.

## STATE OF BRITREA ESTERNLOWLANDS WIDEVELOPMENT PROJECT

# **CMPLETIONEVALUATION**

# Appendix I: Impact Matrix

The matrix shown overleaf reflects the final consensus of the Mission members as to the performance of the principal elements of the project. It consists of the Impact Matrix sheet, with additional information from the Performance and Effectiveness sheet, which itself could not be completed in detail and is therefore not worth presenting. However, the various principal factors of performance and effectiveness are fully expounded in Chapter V of the test of this Main Report, albeit not with reference to individual aspects of poverty impact.

									Dynamic	Sus. Pot
		Asse	ssment of Ch	ange		Reach o	f Change	e	Processes	***
			(1)	)		)	3)		** (4)	(5)
MAIN	Key Questions for Impact Assessment in Rural	Presence				0.4/11				
DOMAINS OF	Affected by the Project	Direction	What Has	Extent of	How	(1)	Who?	Project		
IMPACT	(Changes to which the Project has contributed)	of	Changed?	Change:	Many?	(Poor/	5	Contribution	4/3/2/1	4/3/2/1
					(house-	Poorest/				
		Change		How	holds and	Better-				
		(+) (0) (+)	(indicators)	Much?*	people)	off)	M/F	4/3/2/1		
I. Physical and	1.1 Did farm households' physical assets	0								
<b>Financial Assets</b>	change (farmland, water, livestock, trees,									
	equipment, etc.)?									
	1.2 Did other household assets change	0								
	(houses, bicycles, radios, etc.)?									
	1.3 Did infrastructure and people access to	+	Dirt roads	3	3500	All	M/F	2	1	3
	markets change (transport, roads, storage,									
	communication facilities, etc.)?									
	1.4 Did households' financial assets change	0								
	(savings, etc.)?									
	1.5 Did rural people access to financial	0								
	services change (credit, saving, insurance, etc.)?									

	3			3					3					¢	n							2				
	1			-					3					¢	n							2				
	2			1					33					¢	O							2				
	M/F			ц					Μ					J.V.	M							Μ				
	AII			All					All					11.4	III							Better-	off			
	3500			25/yr					3500					0020	nncc							200				
	2		-	3		-			3					ç	n							1				
	Better local access			Enrolment up					Farmers	Association				Thomas 1040	nugu late	well-set						New	varieties			
0	+	0		0	+				+		0		0	-	ŀ		¢	0		0	0	+		0	¢	0
2.1 Did people's access to potable water change?	2.2 Did access to basic health and disease prevention services change?	2.3 Did the incidence of HIV infection change?	2.4 Did maternal mortality change?	2.5 Did access to primary education change?	2.6 Did primary school enrolment for girls change?	2.7 Did women's and children's workloads	change?	2.8 Did adult literacy rate and/or access to information change?	3.1 Did rural people's organizations and	institutions change?	3.2 Did social cohesion and local self-help	capacity of rural communities change?	3.3 Did gender equality and/or women's	Contutuons criange:	5.4 Du tutat people test surpowered vis-a-vis local and national public authorities and	development partners? (Do they play more	effective role in decision-making?)	2.2 Did rural producers leel empowered VIS-a-	of input supply and marketing of their products?	4.1 Did children's nutritional status change?	4.2 Did household food security change?	4.3 Did farming technology and practices	change?	4.4 Did the frequency of food shortages		4.5 Did agricultural production change (area, vield, production mix, etc.)?
II. Human Assets									III. Social Capital	and People's	Empowerment									<b>IV. Food Security</b>	(Production,	Income and	Consumption)			

	5.1 Did the natural resource base status change	+	Less tree	2	3500	All	M/F	2	2	3
V. Environment	(land, water, forest, pasture, fish stocks, etc.)?		cutting for							
and Common			agims							
<b>Resource Base</b>	5.2 Did exposure to environmental risks	0								
	change?									
VI. Institutions,	6.1 Did rural financial institutions change?	0								
<b>Policies</b> , and	6.2 Did local public institutions and service	+	Constitution	3	000 <i>L</i>	All	M/F	3	2	2
Regulatory	provision change?									
Framework	6.3 Did national/sectoral policies affecting the	0								
	rural poor change?									
	6.4 Did the regulatory framework affecting	0								
	the rural poor change?									

\* Rating: 4= high; 3= substantial; 2= modest; 1= negligible. The rating here is based on the rural poor's (and their partners') perspectives in relation to the situation in the base year. \*\*\* Rating: 4= highly likely, 3= likely; 2= unlikely; 1= highly unlikely.\*\* This refers to cases where even though impact achievement is modest or negligible, the project in question has set in motion dynamic positive processes that will eventually lead to substantial impact achievement. The identification of the existence of these processes is left to the evaluators' judgement on a case-by-case basis.