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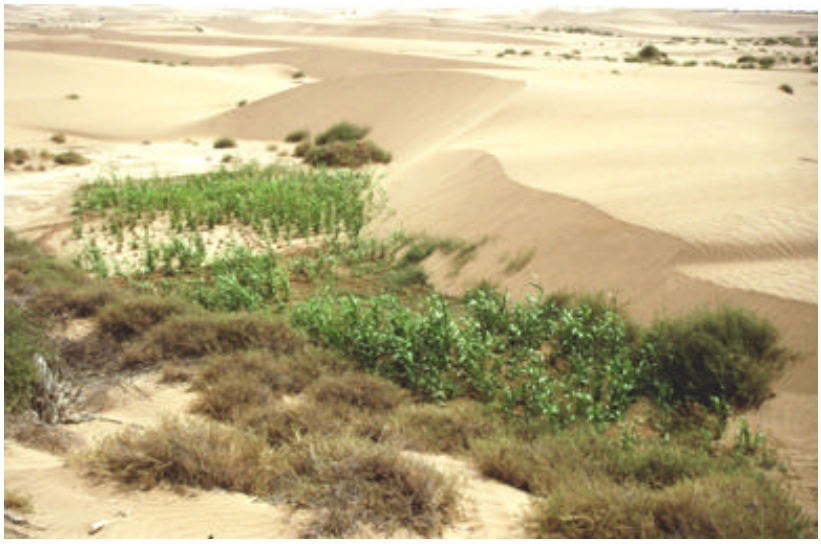

The Republic of Yemen
Tihama Environment Protection Project
Interim Evaluation Report

March 2003
Report No. 1360-YE

Photograph on cover page:
The republic of Yemen
Tihama Environment Protection Project: Sorghum field encroached by sand dune
Source: Photo by Andreas Gerrits, Office of Evaluation - IFAD

DOCS Open no. 295394

The Republic of Yemen
Tihama Environment Protection Project (330-YE)
Interim Evaluation

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*Annexes are available upon request from the Office of Evaluation (evaluation@ifad.org)

Currency Equivalents

Currency Unit = Yemani Rial (YER)
USD 1 = YER 168 (2001 Average)

Fiscal Year of Government and CACB
1 January to 31 December

Abbreviations and Acronyms

AREA	Agricultural Research and Extension Authority
AWPB	Annual Work Programme and Budget
CACB	Cooperative and Agricultural Credit Bank
CLP	Core Learning Partnership
COSOP	Country Strategic Opportunities Paper
EPDA	Environmental Protection and Development Association
GDP	Gross Domestic Product
GOY	Government of the Republic of Yemen
IDA	International Development Association
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
MAI	Ministry of Agriculture and Irrigation
M&E	Monitoring and Evaluation
MTR	Mid-Term Review
NCU	National Cooperative Union
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PMU	Project Management Unit
SLA	Subsidiary Loan Agreement
TA	Technical Assistance
TDA	Tihama Development Authority
TEPP	Tihama Environment Protection Project
UNDP	United Nations Development Programme
UNOPS	United Nations Office for Project Services
WASD	Women's Association for Sustainable Development
YAR	(former) Yemen Arab Republic or North Yemen

Definitions of Shelter Belts

The following terms are used in the report:

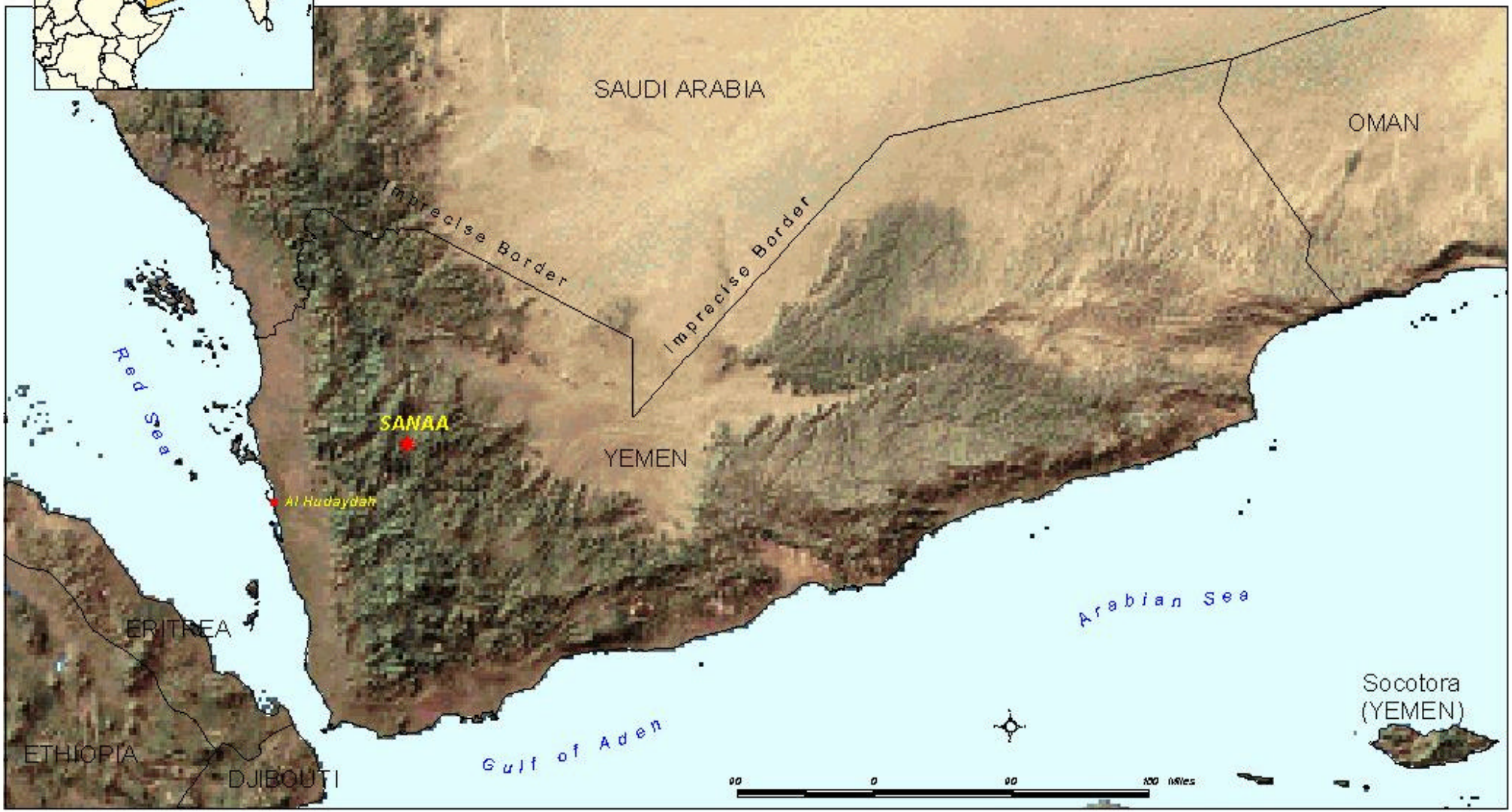
1. A shelterbelt or on-farm shelterbelt is a belt of trees planted around a farmer's field or fields to protect the crops from the damaging effect of wind and blowing sand. These trees are planted and irrigated by the farmers, although the project may have provided the seedlings to the farmer at no cost.
2. A sand dune stabilization [tree] belt or tree belt is a band of trees 100 metres or more wide planted along the edge of the sand dunes to stop sand from encroaching onto agricultural land, or blocking roads etc. These trees are planted, irrigated and protected by the TDA.
3. Sand dune stabilization belts may (should) include mechanical stabilization measures or fences made from palm leaves or other vegetative material. These fences can be of various designs involving one or more lines of material or be planted in some other pattern e.g. checkerboard. These fences protect the trees when they are young.

REPUBLIC OF YEMEN

TIHAMA ENVIRONMENT PROTECTION PROJECT

INTERIM EVALUATION

Map 1 - Satellite Image of the Yemen Landscape



Source: *Compiled by OE/IFAD (ESRI Satellite Image, Digital Chart of the World)*

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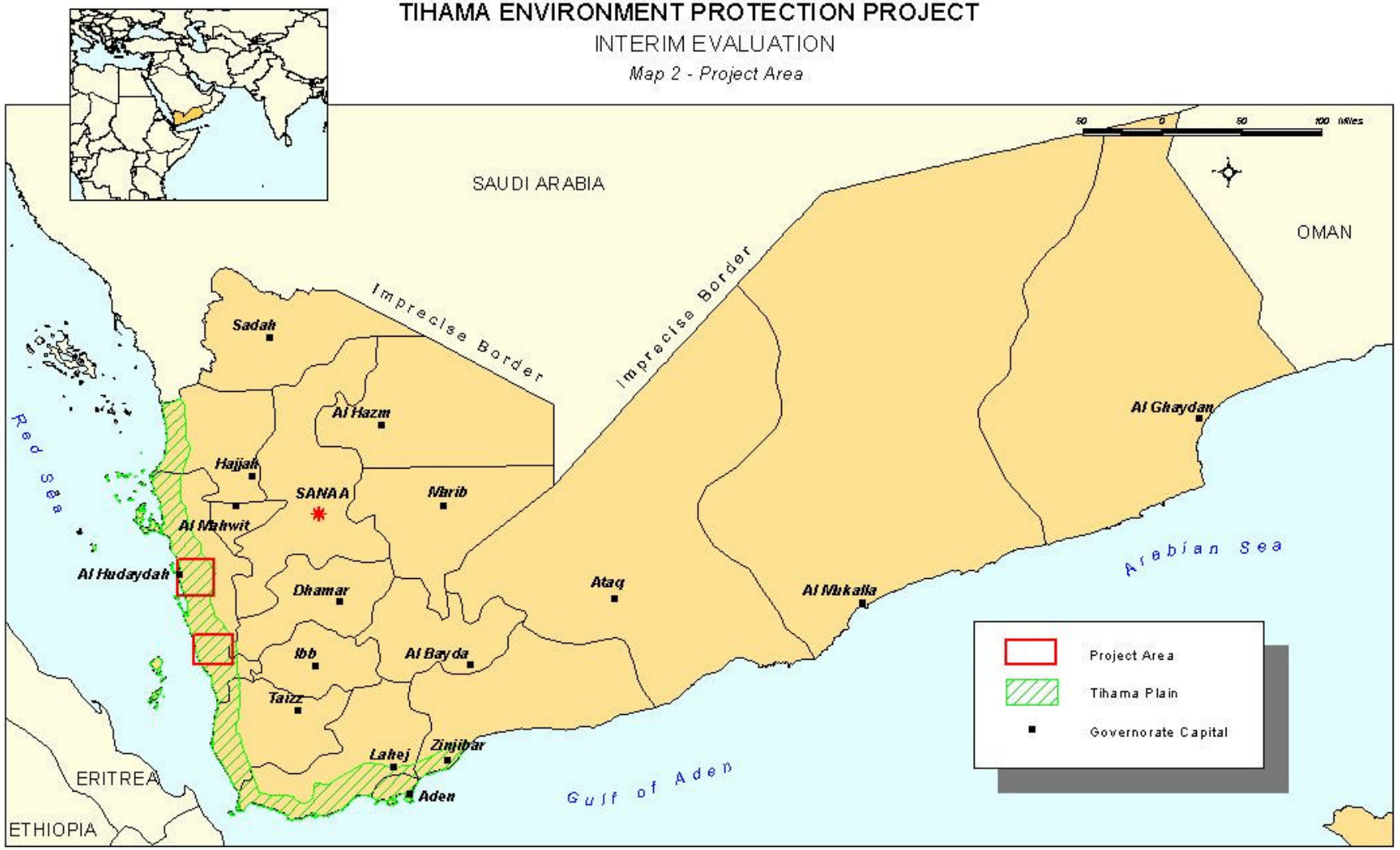
REPUBLIC OF YEMEN

TIHAMA ENVIRONMENT PROTECTION PROJECT

INTERIM EVALUATION

Map 2 - Project Area



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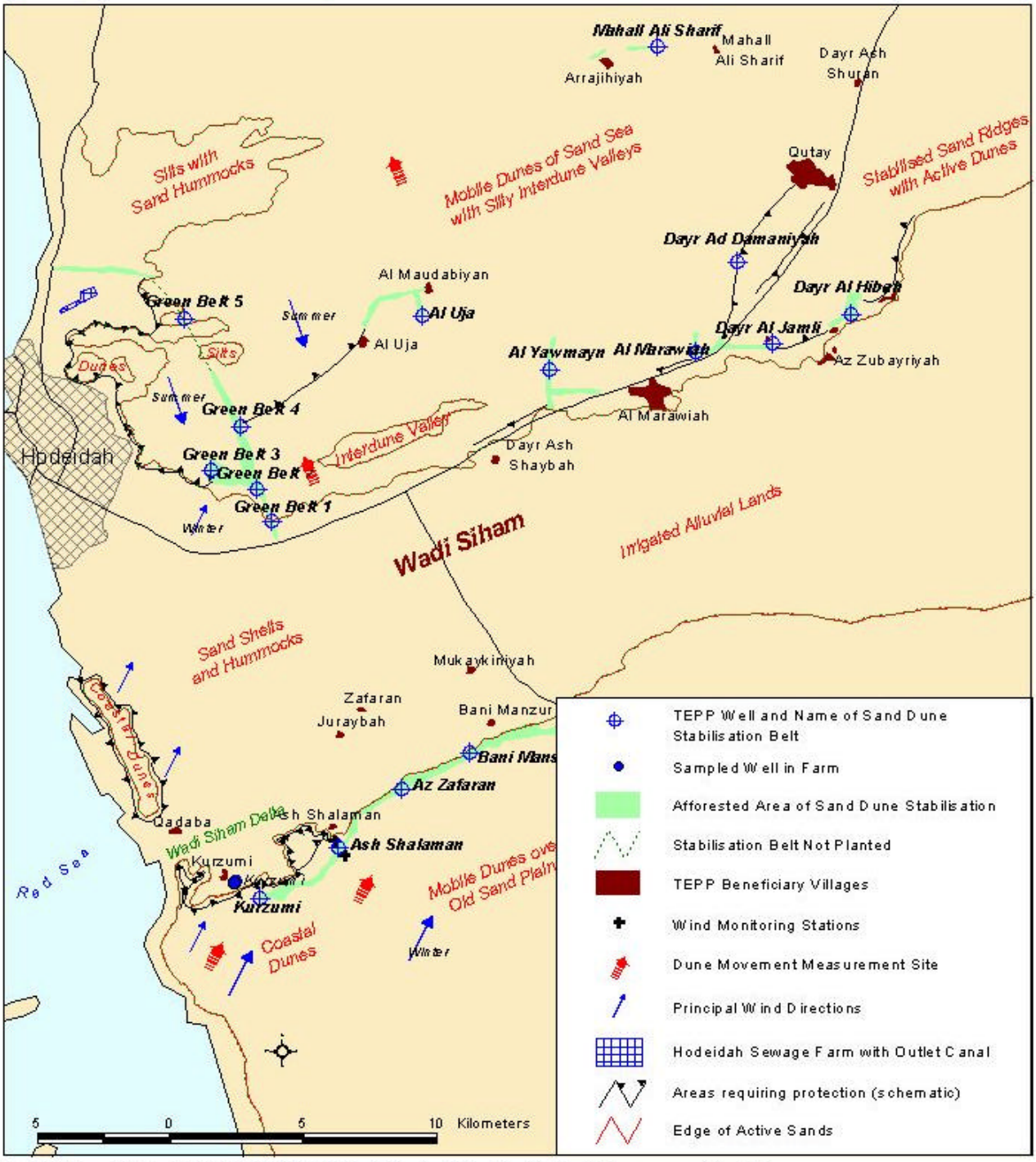
REPUBLIC OF YEMEN

TIHAMA ENVIRONMENT PROTECTION PROJECT

INTERIM EVALUATION

Map 3 - LAYOUT OF SAND DUNE STABILISATION BELTS AND TIHAMA ENVIRONMENT PROTECTION PROJECT WELLS IN WADI SIHAM



Source: *Compiled by OE/IFAD (ESRI Digital Chart of the World, Field Assessment by OE)*

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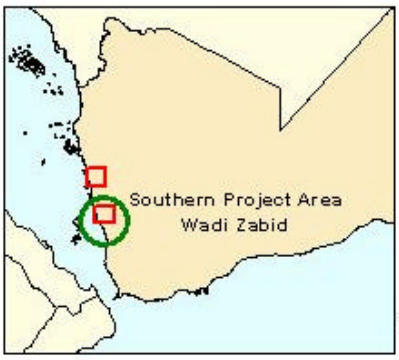
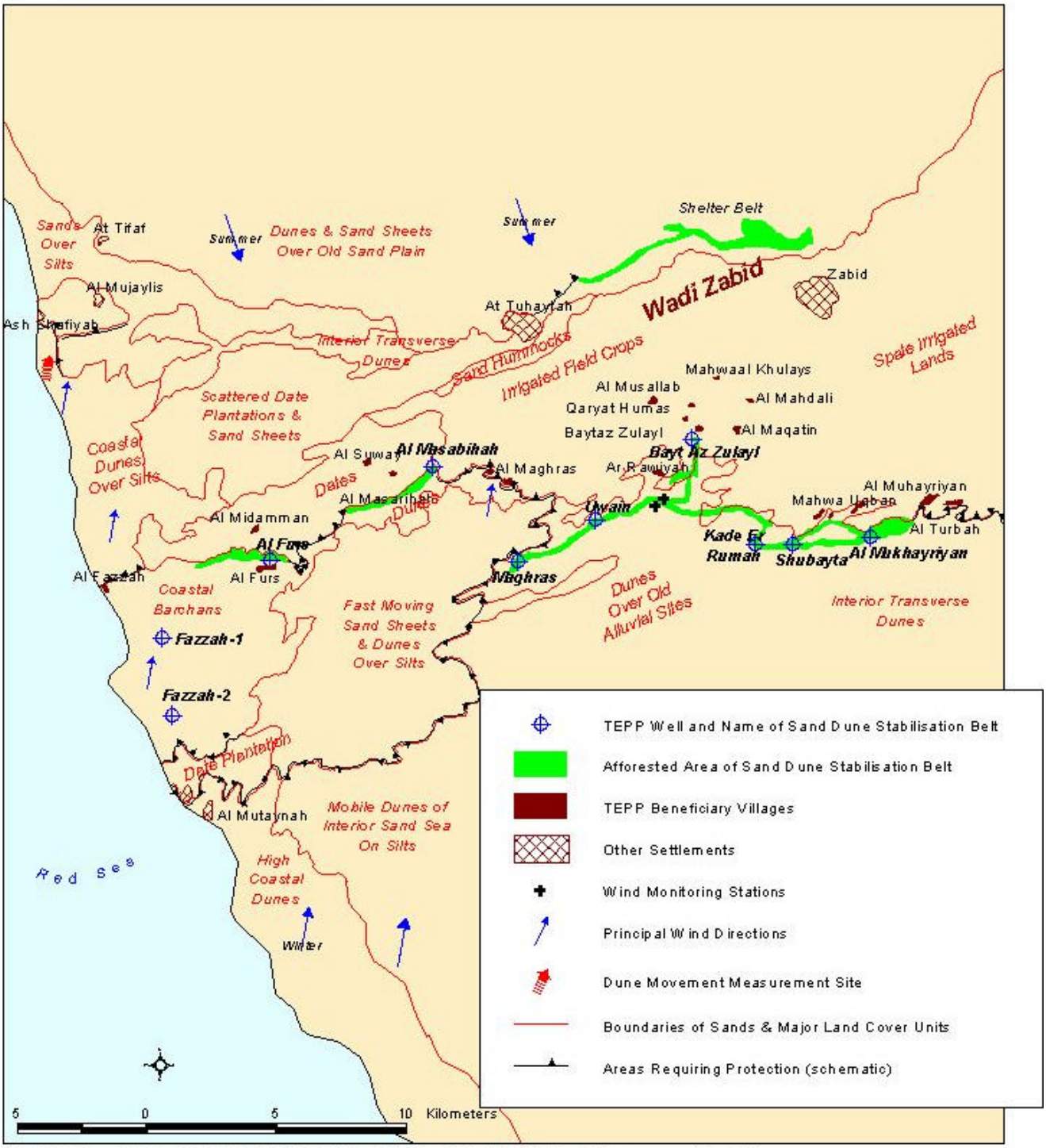


REPUBLIC OF YEMEN

TIHAMA ENVIRONMENT PROTECTION PROJECT

INTERIM EVALUATION

Map 4 - LAYOUT OF SAND DUNE STABILISATION BELTS AND TIHAMA ENVIRONMENT PROTECTION PROJECT WELLS IN WADI ZABID



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The Republic of Yemen
Tihama Environment Protection Project (330-YE)
Interim Evaluation

AGREEMENT AT COMPLETION POINT[1]

Insight 1: Project Design and Supervision

1. Project design was appropriate and innovative with an objective that was relevant for the rural poor in the Tihama and is consistent with the Country Strategic Opportunities Paper, the Government's objective of improving the standards of living of the rural population and the Interim Poverty Reduction Strategy Paper. Further the focus on women and the environment is in line with IFAD's mandate.

2. Nevertheless, with the benefit of hindside, for some design areas the necessary information to facilitate implementation was lacking: (i) despite recognising that beneficiary participation was crucial for the sustainability of project interventions, the participatory processes to be followed was not sufficiently spelled out, nor was there clear indication that this area should be further investigated during implementation. This seriously influenced the adequacy of the participatory processes during implementation; (ii) the incompatibility of the national and IFAD's procurement procedures in respect of the ceiling above which it is necessary to advertise and request tenders as not sufficiently addressed, which delayed procurement; (iii) there was no requirement for the project to record project expenditure by component as well as by category of expenditure, which has prevented a comparison of project expenditure by component with the appraisal estimates, while the auditing requirements were too brief and general; (iv) drafts of the proposed Subsidiary Agreements, which help ensuring that these agreements are consistent with project design, were not included in the appraisal report; (v) the design of the technical assistance input did not initially include a technical assistance team leader, which is essential when a large technical assistance team is involved to coordinate the programme and ensure consistent reporting and modern management techniques; and (vi) cost recovery/sharing arrangements for project-financed services were not sufficiently stressed by the design and were introduced towards the end of the project in an attempt to ensure sustainability.

3. Unperceived gaps in any project design can be minimized if project supervision is able to provide the administrative and managerial support needed by project management. However, the limited resources for supervision has contributed to the problems faced by UNOPS in this project, in particular, the reduction in the number of supervision missions from two to one per year and the insufficient technical inputs during supervision. A related lesson concerns the need during supervision to insist that the resources proposed at appraisal and needed for implementation are provided. Because this course of action was not followed with respect of the support to rural women component, its outreach and potential impact were reduced. Similarly it had adverse consequences on the capability of the M&E unit.

Recommendations

- *Future project design documents should include; (i) the details of the participatory process to be followed, including the arrangements at village level, who will undertake this work; and a sufficiently detailed analysis to demonstrate that the organization(s) to be involved have the capacity and experience to carryout the work involved; (ii) a review of the Government*

[1] The members of the Core Learning Partnership were: Messrs Farid Mujawar (Deputy Minister of Agriculture and Irrigation), Anwar Al Harazi (Deputy Minister for Technical Cooperation or representative), Mohamad Yahia Al Gasham (Chairman Tihama Development Authority), Abdulmalik Al Thawr (General Director of Planning and Monitoring of the Ministry of Agriculture and Irrigation), Zain Haig (Project Manager of the TEPP), Mohamad Al Wadan (Chairman of the Cooperative and Agricultural Credit Bank), Mohammed Hassani (IFAD Country Portfolio Manager for Yemen), Mohamed Chaalala (Senior Project Implementation Officer, UNOPS) and Ms Mona Bishay (IFAD Senior Evaluator).

procurement procedures to ensure compatibility with the IFAD procurement guidelines; and (iii) draft subsidiary agreements so that they are part of the design and discussed prior to loan negotiations.

- *The project design documents should specify: (i) a requirement for the project to record project costs by component as well as by category of expenditure so management can monitor project costs by component during implementation; and (ii) greater details concerning the audit requirements in the design documents and in the Loan Agreement. The latter should include the following: (i) that the audit will be in accordance with International Standards on Auditing and the audited accounts and financial statements, will be in a format agreed with IFAD and include separate opinions on the statements of expenditure and the operations of the Special and Project Accounts; and (iii), the audit report will be in a Long Form audit and will contain a separate management letter to which the Project Management Unit will reply within one month.*

- *When a large technical assistance team is proposed a TA Team Leader should be included with terms of reference that include the introduction of modern management techniques (e.g. planning, budgeting, accounting, monitoring etc.).*

- *Cost recovery/sharing arrangements for project-financed services should be included as part of the design, and discussed in details at project's start up workshop.*

- *In a challenging socio-economic context like that of Yemen there is a need to provide increased resources to the Cooperating Institution to give the support required during implementation. Two full supervision missions a year are necessary with the presence of technical specialists when required.*

- *In addition, IFAD needs to take prompt action in respect of non-compliance with the loan agreement if the problems identified are not to continue hampering project implementation.*

Insight 2: Physical Achievement, Beneficiary Participation and Sustainability

4. The physical achievements of the project in comparison to appraisal targets are impressive and much experience has been gained during implementation. This can be seen in the length of sand dune stabilization belts established, the associated infrastructure provided and the area protected by on-farm shelterbelts and others. In general, the project must be commended for achieving physical appraisal targets and sometimes surpassing them.

5. These achievements, however, are under threat because of doubt over the sustainability of the investments in sand dune stabilization and hence their replicability. This is caused by the insufficient commitment by the surrounding communities to manage the physical assets built by the project. A main reason for this is that local communities have not fully participated in site selection and were not adequately mobilized from the beginning of the process. Sustainability is also unlikely due to the continuing need to irrigate the trees after the end of the project and concerns about the future availability in many places of suitable groundwater for this purpose.

6. The project has recently recognized the need for community involvement, and supported for this purpose the Environmental Protection and Development Associations. The ability of these associations to fulfil the role envisaged for them could not be established.

7. The Tihama Development Authority should be commended for its efforts to develop its team of female extension workers, adult literacy activities and for the recruitment and training for two years of 22 women to work as midwives. Some activities have made an appreciable effect on women's workload, productivity and self-confidence e.g. the provision of domestic water supplies, health

services, interest free livestock grants and the literacy classes. But so far the sustainability and replicability of these activities are in doubt. The work of the component has also been hampered because the overall provision of staff training and TA for this component was far less than envisaged at appraisal. In addition, the work of the female staff is restricted due to the lack of supplies, equipment, and transport, a lack of leadership at the central level and lower financial incentives than their male colleagues.

Recommendations

- *Efforts should be devoted to developing, supporting and testing the management capacity of the existing Environmental Protection and Development Associations and establishing them where they do not yet exist.*

- *The project should establish the actual costs of operating each of the wells and maintaining the sand dune stabilization belts so that a realistic estimate can be made of their financial viability.*

- *Dialogue with the Governor of Hodeidah, the Agricultural Co-operative Union, the newly elected local councils and local NGOs should be stepped up to assess the extent to which these organizations can help to undertake community mobilization at the village level for the maintenance and financing of the sand dune stabilization belts.*

- *Support to any future sand dune stabilization activities should wait until the project has developed a model of community participation that shows that the sand dune stabilization belts will be sustainable when outside assistance ceases or concluded that sand dune stabilization should be treated as a public good and financed accordingly. In the meantime The Tihama Development Authority should enhance its efforts to: (i) produce the planned sand dune stabilization manual; (ii) repair localised gaps in the sand dune stabilization belts; (iii) using existing studies look closely at the regional sand movements to determine where additional sand dune stabilization belts are needed; (vi) develop an approach suitable for the coastal areas, which are the source of the sand problem; and (vii) investigate a number of fast growing and productive exotics that have been successful in shelterbelts in Wadi Tuban and elsewhere in the region.*

- *Activities related to rural women, highly appreciated by the local communities, should receive further support by TDA through: (i) provide the female extension staff with additional vehicles on a full time basis; (ii) introduce gender equity in respect of the staff incentive allowances paid; (iii) provide the refresher training for female extension staff; and (iv) recruit qualified women staff to provide the leadership required.*

- *The commendable dialogue initiated with the Ministries of Education and Health should be followed-up to ensure the effective use of the extension staff trained in adult literacy, nutrition, family health, and develop a long-term arrangement for the effective deployment of the project-trained midwives. These arrangements should also consider the provision of basic equipment and supplies required by the midwives at the village level and introduce an element of cost-recovery that will ensure sustainable service provision by them at the village level. The project should identify teachers at the village level and help them develop a sustainable model for the delivery of adult literacy and primary education for girls in the villages through the introduction of school fees, etc.*

Insight 3: Monitoring and Evaluation and Impact Assessment

8. The reporting on physical progress by the project has been regular and adequate, based on collection of reports from experts technical division and the extension services. However, the collection, analysis and storage of data is greatly hampered by a lack of staff (with only three people

designated to carry out all M&E work for the Tihama Development Authority) computers and transport. The M&E Unit is supposed to compare the data collected with the annual work programme and budget and the appraisal estimates, identify gaps and problems, and give appropriate feedback to project management. However, no structure is in place to do this regularly and feedback seems to have been provided only rarely. M&E activities are regarded more as a donor requirement rather than a management tool. While some efforts have been made towards investigating beneficiaries reaction to some project activities, by the time of the evaluation there was no comprehensive assessment of emerging project impact. In addition, data on project expenditure is only available by category of expenditure thus preventing the comparison of project costs by component with the annual work programme and budget and appraisal estimates, and the undertaking of costs benefit analysis. The Cooperative and Agricultural Credit Bank has collected data concerning the socio-economic status of the borrowers but little analysis of this data was done.

Recommendations

- *Monitoring and evaluation should be an integral part of the department that is responsible for project implementation and not be the responsibility of a separate donor financed M&E unit and should be provided with adequate resources.*

- *The project should enhance its efforts to identify key indicators for issues like environment, employment, food security, water management, and family well being so the Project Completion Report can include an assessment of the impact of the project. Data should be collected using a standardised format to establish the socio-economic profile of the beneficiaries and analysed by the M&E unit.*

- *The Cooperative and Agricultural Credit Bank should computerise and analyse the data on the landholding and livestock ownership pattern of each borrower to provide a clear socio-economic profile of the borrowers to assess project impact.*

- *In future, projects must record project expenditure by component as well as by category of expenditure so that an analysis of the cost effectiveness of project interventions by component can be assessed and a cost benefit analysis undertaken where this is appropriate.*

Insight 4: Provision of Credit

9. Evaluation findings indicate that the borrowers are generally from the IFAD target group, although they are not the poorest households as most loans require collateral. The ceiling for collateral free loans is too low for women and sharecroppers, i.e. those without collateral, to make a worthwhile productive investment. These groups also require non-credit assistance if they are to be able to make the best use of credit funds. With 99% of the IFAD loan disbursed there are no additional loan funds available for the Cooperative and Agricultural Credit Bank to make new loans in the project area and the Bank will have to meet the expected demand from other sources including the repayments from the project-financed loans already made. However, the loan repayment rate is low (62% for project loans at the end of December 2001 but higher than that for non-project loans) and there is a need for a substantial increase to ensure the sustainability of the Bank's project-financed credit operations and the Bank itself. The Bank has yet to establish a single revolving fund for the repayments as required by the Subsidiary Loan Agreement from which to make new loans in the project area. The main insights are that: (i) there is a need to reform the system of collateral based lending if credit is to benefit the poorest rural groups and women; and (ii) greater attention needs to be given to the collection of loan repayments if lending is to be financially viable and credit operations sustainable in the long-term.

Recommendations

- *To ensure an uninterrupted credit supply until the end of the project period the Tihama Development Authority and the Cooperative and Agriculture Credit Bank should jointly assess what action should be taken to provide additional funds if future project lending cannot be met from the repayments of existing project loans.*

- *To improve disbursements of loans for water conservation and for rural women, the Bank should review its loan eligibility and increase the ceiling for collateral free loans, use informal intermediaries such as savings and credit associations and self-help groups*[2]*, and employ female credit officers.*

- *To improve the low repayment rates for project loans Bank branches should introduce concerted efforts through follow-up visits and loan recovery campaigns.*

- *The Bank should withdraw the instructions to the project area branches (including Bajil, Beit-el-Faki and Hays) to maintain a branch level separate Revolving Funds and instead take steps to set up one consolidated Revolving Fund and to maintain an up-to-date record of recoveries of project loans and their deployment for re-lending. This will also ensure that recoveries of past loans to farmers outside the project area are re-lent to project area villages.*

- *Early implementation of the entire restructuring initiative, which IFAD is supporting, would help the Bank become a sustainable financial institution.*

10. The following additional lessons from project experience would benefit future rural credit operations in the Yemen: (i) when the scope and allocation for credit is increased significantly during implementation, supervision missions should examine the loan eligibility and collateral criteria and widen the availability of credit to the target group; (ii) the design of credit programmes for the rural poor, especially women, should also include specific interventions to increase their access to credit e.g. capacity building, community participation, training etc.; and (iii) project design should consider means of coordination between the agencies responsible for project implementation, at both top management and field levels to avoid delays and serious implementation problems.

Options for Future IFAD Assistance in the Tihama

11. Support for sand dune stabilization should be conditional upon clear evidence that project activities are sustainable and economically viable. Other options for IFAD support, based on the analysis of current experience could include: (i) support for rural women in one or more *wadis* with similar components to those included under the present project's Support to Rural Women with a focus of livestock, including forage production, water supplies, rural financial services, literacy and primary health care; and (ii) support for agricultural services to enhance extension, adaptive research, rural finance and animal health and plant protection services targeted at the smaller land and pump owners and their sharecroppers.

[2] A start is being made under the IFAD-assisted Al-Mahara Rural Development Project and similar arrangements have been agreed for the Dhamar Highland Areas Participatory Development Programme.

The Republic of Yemen
Tihama Environment Protection Project (330-YE)
Interim Evaluation

EXECUTIVE SUMMARY

I. INTRODUCTION

1. The objectives of the interim evaluation were to assess: (i) the achievements of the project so far and its impact on the target groups in relation to the original design; (ii) the extent to which the project has achieved its objective of developing a sustainable framework for natural resource management that can be replicated in other areas of the Tihama; (iii) the future options for IFAD and Government cooperation in the Tihama; and (iv) to derive lessons from this experience for the benefit of similar interventions elsewhere.

2. The evaluation involved a review and analysis of project documents and discussions with government officials and extensive interactions with project beneficiaries. Fieldwork was participatory with Yemeni counterparts involved throughout. Fielded in the first semester of 2002[3] the evaluation mission covered 25 of the 47 project villages and held extensive discussions with over 360 beneficiaries, both men and women on the basis of pre-tested open-ended questionnaire. The mission met senior staff of the Ministry of Agriculture and Irrigation (MAI) and the Ministry of Planning and Development, and had wide covering discussions with the staff from the following agencies engaged in project activities: (i) the Tihama Development Authority (TDA), a semi-autonomous body under MAI; (ii) the Cooperative and Agricultural Credit Bank; and (iii) the Agricultural Research and Extension Authority.

3. At the end of the fieldwork the mission discussed its initial findings with the Chairman and staff of TDA and briefed the Governor of Hodeidah. The mission prepared an Aide Memoire which presented the mission's preliminary findings and conclusions in a wrap-up meeting held in Sana'a, chaired by the Deputy Minister of Agriculture and Irrigation and attended by members of the Core Learning Partnership (and other representatives of the implementation agencies). The draft evaluation report was shared with the CLP members and their comments taken into consideration to the extent possible. A number of lessons in key areas of project design and implementation were identified by the evaluation and these form the basic content of this agreement. The lessons relate to: (i) project design and supervision; (ii) beneficiary participation and sustainability; (iii) monitoring, evaluation and impact assessment; and (iv) provision of credit.

II. EVALUATION APPROACH

4. The objectives of the interim evaluation were to assess: (i) the achievements of the project so far and its impact on the target groups in relation to the original design; (ii) the extent to which the project has achieved its objective of developing a sustainable framework for natural resource management that can be replicated in other areas of the Tihama; (iii) the future options for IFAD and Government cooperation in the Tihama; and (iv) to derive lessons from this experience for the benefit of similar interventions elsewhere.

5. This was the first evaluation to use IFAD's new common framework of evaluation, which has a greater emphasis than previously on impact assessment. The evaluation criteria used are: (i) **Rural Poverty Impact** covering six domains of impact and one criterion each for sustainability and replicability; (ii) **Performance of the Project** consisting of relevance of objectives, effectiveness and

[3] The mission was organized and supervised by Ms Mona Bishay (Senior Evaluator from IFAD's Office of Evaluation) with the following membership: Messrs Michael Rayner (Team Leader/Economist), Hamdi Eisa (Farming Systems), Andreas Gerrits (IFAD Associate Professional Officer/Monitoring and Evaluation), Bal Godbole (Rural Financial Services/Institutions), Neil Munro (Land Conservation/Sand Dunes) and Ms Maliha Hussein (Rural Sociologist/Gender).

efficiency; and (iii) **Performance of the Partners** including IFAD, the Cooperating Institution, Government and its agencies, NGOs/CBOs and cofinanciers (if any).

6. The evaluation involved a review and analysis of project documents and discussions with government officials and extensive interactions with project beneficiaries. Fieldwork was participatory with Yemeni counterparts involved throughout. The evaluation mission visited Yemen in February/ March 2002. The fieldwork covered 25 of the 47 project villages and held extensive discussions with over 360 beneficiaries, both men and women on the basis of pre-tested open-ended questionnaire. The mission met senior staff of the Ministry of Agriculture and Irrigation (MAI) and the Ministry of Planning and Development, and had wide covering discussions with the staff from the following agencies engaged in project activities: (i) the Tihama Development Authority (TDA), a semi-autonomous body under MAI; (ii) the Cooperative and Agricultural Credit Bank; and (iii) the Agricultural Research and Extension Authority.

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III. POVERTY AND IFAD STRATEGY

8. Yemen, which covers 537 000 km^2 in the Southwest corner of the Arabian Peninsula, has a population of about 18.3 million and suffers from severe poverty[4] because of (inter alia) a poor resource base and a high rate of population growth (3.5%). Poverty affects 30-40% of the population but over 80% of the poor live in rural areas. IFAD has supported 15 projects in Yemen with loans totalling over USD 136 million. Four of these projects are under implementation, while a sixteenth has recently been appraised. IFAD's strategy in Yemen focuses on the mobilization of resources in support of agricultural and rural development activities designed to assist the poorest farmers, entrepreneurs and rural women. A consistent theme has been institutional strengthening as weak institutional capacity has been recognized as limiting project implementation.

IV. TIHAMA

9. The arid Tihama plain is the country's most important agricultural area, consisting of sand plains and dunes interrupted by *wadi*[5] flood plains. The Tihama covers an area of about 22 000 km^2 with slopping land about 30-60 km in width and extending along the Red Sea to the west and up to the foot of the mountains in the east. Eight *wadis* intersect the plain and collect run-off from the highlands to the east. The run-off makes its way through incised valleys to emerge on the coastal plain, where the water is used for spate irrigation and recharges the alluvial aquifer (the largest in the country) for urban and domestic water supply and irrigated agriculture. Rarely, small amounts of runoff reach the Red Sea.

V. MAIN DESIGN FEATURES

10. **Project Design Rationale**. Wind erosion, sand dune encroachment and over abstraction of groundwater were jeopardising previous agricultural investments in the Tihama. The region offered opportunities for sustainable agricultural development and an improved standard of living for the rural population if: (i) the threat of sand dune encroachment could be minimized so that the land and water resources could be managed in a sustainable way with the full and active participation of the beneficiaries, including women; and (ii) the management capacities and monitoring and evaluation procedures of the institutions could be strengthened to ensure effective implementation of the project activities and develop replicable models for sustainable environmental protection.

[4] According to the 2001 UNDP Human Development Report Yemen has a HDI ranking of 133rd and Gender Development ranking of 131st out of 162 countries.

[5] A run-off valley is called a *wadi.*

11. **Project Area and Target Group**. The project area was specified as the 47 villages and their farmland that lie within 2 km of the contact zone where the inter-*wadi* sand plains and the *wadi* flood plains meet in *Wadi* Siham and in *Wadi* Zabid. The contact zone is about 70 km long, with around 35 km in each *wadi*. In this zone large areas were under an immediate threat from sand dune encroachment, groundwater resources were being over-exploited in many places and large numbers of households were amongst the poorest in the Tihama. There were 7 100 households in the 47 villages with a high concentration of sharecroppers and farm labourers. Beyond the end of the life of the project, a total of 20 600 families was expected to benefit from the stabilization of the sand dunes. Cereals, forage and cotton followed by fruit and vegetables are important crops, while livestock provide about 20% of the agricultural output.

12. **Objectives**. The project has the **overall goal** of contributing to the Government's programme for improving the standards of living of rural people. The **primary objective** is to identify and demonstrate, by implementation on a limited scale, appropriate and replicable methods for the management of natural resources to support sustained and increased agricultural production. The **project's specific objectives** are to: (i) prevent further encroachment of sand dunes on to farming land; (ii) increase water use efficiency for cropping and livestock in the areas most threatened by encroachment of sand dunes; (iii) increase livestock productivity; (iv) improve women's literacy, family health and nutrition standards; and (v) improve the capacity of the Tihama Development Authority to plan, implement, monitor and evaluate the project and other donor and Government financed projects.

13. **Project Components**. To achieve these objectives the project has four components. The **Land Conservation** component (47% of project costs) would stabilize sand dunes using mechanical and biological methods, so providing an environment that would enable villagers to plant on-farm shelterbelts and would monitor the speed of sand sheet and sand dune migration. The **Water Conservation** component (11% of project costs) would improve existing irrigation systems through the provision of credit to farmers for the purchase of improved technology and evaluate and develop appropriate irrigation technologies and monitor water levels. The **Support for Rural Women** component (17% of project costs) would provide assistance for livestock production (extension, veterinary services and credit), literacy teaching, health education and services and extension services for household food production and processing. The **Management Support** component (25% of project costs) would enhance the technical and managerial capabilities of the Tihama Development Authority, including monitoring and evaluation procedures, the provision of a national level liaison officer and support the formation of farmer cooperatives.

14. Over a seven-year implementation period, the estimated project costs was USD 11.7 million and the IFAD loan USD 9.8 million with the Government contributing USD 1.8 million and UNDP 86 000 (this did not in practice materialize). The long project design period, which started in 1990, culminated in Executive Board approval in April 1993 and the loan became effective at the end of 1995. The loan closing date is 30 June 2003.

15. The Tihama Development Authority is responsible for implementing project activities (except for the credit and research activities) through its existing structures, with a full-time Project Manager responsible for coordination and follow-up. The M&E unit is to undertake: (i) input/output monitoring; (ii) ongoing evaluation; and (iii) impact evaluation. The Cooperative and Agricultural Credit Bank is the channel for providing project-financed loans under a Subsidiary Loan Agreement with the Ministry of Finance. The eligibility and security criteria for the provision of project loans are the same as those the Bank was using under the IFAD Agricultural Credit Project in the Tihama. For research the Tihama Development Authority and the Agriculture Research and Extension Authority were to operate according to a Subsidiary Agreement, which was to include a planned programme of collaborative research.

16. Beneficiary participation was identified as essential for the sustainability of project activities and in the absence of grassroots organizations the project was to support the establishment of

cooperatives within the project area with the assistance of the Hodeidah branch of the National Cooperative Union under a Subsidiary Agreement with the Tihama Development Authority. The cooperatives were to eventually manage the project investments in land conservation.

VI. PROJECT IMPLEMENTATION

17. **Changes in Design**. Implementation of the project has been characterized by flexibility in respect of the original design with some significant changes, which can be summarized as follows: (i) the size and scope of the credit subcomponents were increased; (ii) there were changes to the 47 project area villages, some of which were logical as the villages excluded did not have a sand problem; (iii) the UNV technical assistance was replaced by five experienced long-term specialists from Sudan reportedly at a comparable cost per person month; (iv) the proposed construction of the fore-dunes was dropped following the recommendations of the technical assistance and a consultancy study; (v) a major programme of short-term overseas training for staff was introduced at a cost of over USD 800 000; (vi) *Mesquite* (*Prosopis juliflora*) was replaced by a range of other species for planting in the sand dune stabilization belts; (vii) the arrangements for introducing beneficiary participation through the establishment of cooperatives were not pursued; (viii) at the request of the Governor of Hodeidah the project introduced a sand dune stabilization belt to protect the town of Hodeidah from sand encroachment, part of which is irrigated by sewage water; (ix) the proposed appointment of a liaison officer at national level was deemed unnecessary and dropped; (x) project allowances for Tihama Development Authority staff working on project-financed activities were introduced to improve staff motivation with the cost reimbursed from the IFAD loan. Finally, Schedule 2 of the Loan Agreement was revised in September 2000 to take account of the expected changes in expenditure under the various loan categories and the inclusion of an expenditure of USD 300 000 for the disposal of toxic waste in *Wadi* Surdud (i.e. outside the project area).

18. **Progress**. Despite the two-year delay in effectiveness and slow start to project activities 99% of the loan had been disbursed by March 2002, more than a year before the loan closing date. In addition, to the remaining balance in the Loan Account, the Government has allocated the equivalent of about USD 294 000 for project activities, excluding staff salaries in 2002. Project records do not enable a comparison of project expenditure by component with the appraisal estimates, an important monitoring tool, as the need for such records was not specified in the project design. However, data on physical progress, including comparisons with the project targets, is available.

VII. SUMMARY OF ACHIEVEMENTS AND RURAL POVERTY IMPACT

19. **Physical Achievements.** The physical achievements of the project in comparison to appraisal targets are impressive and much experience has been gained during implementation and should be recorded. This can be seen in the length of sand dune stabilization belts established, the associated infrastructure provided (wells, irrigation infrastructure and access roads) and the area protected by on-farm shelterbelts and others. Progress in physical achievements and comparison with appraisal targets were produced on a regular basis by the project and documented by the supervision reports. The IE report (Appendix 2, Table 2) regrouped these data to provide a summary whenever possible on achievements by component. In general, the project must be commended for achieving physical appraisal targets and sometimes surpassing them.

20. **Sand Dune Stabilization**. Despite these favourable achievements, many of the sand dune stabilization belts are perceived by farmers as being too far away to offer effective protection to the village and/or the trees are still too small for their effect to be felt, as many of the stabilization belts have only recently been planted. In villages immediately threatened by the sand dunes, the benefits of protection are more perceptible, but some of these belts suffer from localized gaps reducing their effectiveness.

21. In addition, there is a serious concern over the sustainability of the investments in sand dune stabilization and hence their replicability because of the current lack of ownership and commitment by the surrounding communities to manage the physical assets built by the project. A main reason for this

is that local communities have not appropriately participated in site selection and were not adequately mobilized from the beginning of the process. Sustainability is also unlikely due to the continuing need to irrigate the trees after the end of the project and concerns about the future availability in many places of suitable groundwater for this purpose.

22. On the other hand, project achievements in establishing the on-farm shelterbelts are highly valued by farmers as they reduce the damaging effects of wind on growing crops while the water used to irrigate the fields they protect sustains their growth.

23. The monitoring of winds and sand movements was delayed and the subsequent management of the operation was inadequate. Similarly, the lack of monitoring of water levels in the wells is contrary to what was expected at appraisal. As a result the planned monitoring activities have yet to contribute to the design of the sand dune stabilization measures and to their management.

24. **Water Conservation**. The project has made little contribution to water conservation and has not developed any replicable model for this purpose. The Bank disbursed only 22 loans in the project area for PVC pipes. The project did not test alternative irrigation technologies and project financed research activities were hampered because the cooperation between the Project and the Agricultural Research and Extension Authority did not materialize as planned, despite the agreement signed in 1999. As a result the involvement of the Agricultural Research and Extension Authority was minimal. Many of the research results are only indicative and subject to interpretation due to a lack of equipment and statistical analysis. Of interest is the use of sewage water to irrigate trees in part of the Hodeidah Greenbelt, although a build up of salinity, an accumulation of heavy metals, nitrates and phosphates and ground water contamination may create problems in the future.

25. **Support for Rural Women**. The Tihama Development Authority is to be commended for establishing a team of female extension workers, for recruiting and training 22 midwives and for the provision of domestic water supplies for project villages. The project has addressed the needs of poor rural women through its interventions in the area of drinking water, health services, literacy classes, animal production and health extension. In particular, the provision of domestic water supplies and the literacy classes have had an appreciable impact on women's workload and self-confidence. However, the project has had only a modest impact on women socio-economic status, due, among others, to the very limited outreach of project credit activities to the rural women, and there is a large element of double counting in the outreach figure reported by project staff. Only the few women who received livestock loans in kind from the project, most of which were given to the most vulnerable households, appear to have realised a substantial increase in household income and productivity.

26. The above-mentioned achievements are under threat because the project did not invest adequately in evolving sustainable or replicable models for the adult literacy activities or the provision of health services. In addition, the work of the female staff is hampered by inadequate provision of planned inputs (e.g. transport, materials, training etc.), limited leadership in the area of support for rural women, and the payment of lower staff incentives to female staff than to the male staff. Project activities in land and water conservation and support for rural women have yet to have a significant impact on food production and security in the areas adjacent to the sand dune stabilization belts through increased agricultural production or sustained employment generated by project activities.

27. **Rural Credit**. CACB has provided 743 loans for a total amount of YER 116.1 million (USD 0.69 million) in the project area[6]. Of these 22 were for water conservation and 100 were for women, much less than anticipated at appraisal. The poorer households are reluctant to apply for CACB credit due to their inability to meet the collateral requirements, the high transaction costs, the lengthy approval procedures and the high interest rates. Women have had little access to CACB credit due to

[6] As per CACB records, credit disbursements under the project were at 1,073 loans for a total amount of YER 170.8 million (USD 1.02 million). However, these included 330 loans for YER 54.7 million (USD 0.33 million) given before 30 September 1999 to farmers of areas along Wadi Siham and Wadi Zabid but outside the project villages, for which use of the loan funds was allowed as a special case.

the low ceiling for collateral free loans and the requirement of land collateral for larger loans. Women do not generally own land and as such a woman cannot fulfil this requirement without the support of her husband or another male household member. The same is true of sharecroppers who can qualify for a loan only if the landowner is willing to offer his land as collateral. Only 6% of the households in the project area have obtained loans from CACB under the project (see also paragraphs 45 and 46).

28. **Management Support**. Staff of the Tihama Development Authority have benefited from the presence of the technical assistance between 1998 and 2001 and should now be able to handle the technical aspects of sand dune stabilization without significant outside assistance. The introduction of staff incentive payments has helped motivate staff and contributed to the good implementation of physical works. However, project implementation has not been without managerial problems[7] and the Tihama Development Authority did not recruit the planned management and finance technical assistance. The M&E unit lacks resources and has not received the inputs envisaged at appraisal. It produces regular reports on physical achievement but no assessments have been made of the social and economic impact of the project on the beneficiaries. The M&E function is not yet an integral part of management nor has it functioned as an appropriate management support. The project has financed the construction of a large training hall but it is not yet in use due to a dispute with the contractor, while the large investment in overseas training seems to have had little effect on the subsequent performance of the trainees.

29. **Community Participation.** Participation, as envisaged at appraisal, has not occurred and there was never any agreement between the National Cooperative Union, or any similar agency, and the Tihama Development Authority. The villagers do not know why the sand dune stabilization belts were located on their present sites and were not consulted on the selection of tree species. Stabilization sites, determined by the project on the basis of technical considerations, do not seem to reflect village level perception on desired sites for effective protection from sand encroachment. There were little local level discussions regarding the subsequent management of the physical assets or ownership of the trees. The project has involved communities to the extent that farmers on whose land the trees are planted have to agree prior to the start of planting.

30. Employment created by the project has been highly valued in the project area and contributed to household income in the short run. While landowners are likely to have benefited more than the others in securing project employment, the landless, tenants, sharecroppers and daily labourers have not been excluded. When employment is provided on a rotational basis, as has occurred in several places, there is an element of equity in the distribution of project benefits from employment. However, the project has had a very limited impact on social capital formation or grass roots institutional strengthening partly because the project did not implement, consistently and timely, the beneficiary participation aspects included in the project design. As a result, the communities have passively received most of the project benefits.

31. **Sustainability**. The project management, on the basis of supervision recommendations, has only recently promoted the establishment of Environmental Protection and Development Associations (EPDA) at the village level to manage and finance the sand dune stabilization belts when project assistance finishes. Eight such associations were established by March 2002. While no doubt a commendable effort, the establishment of these associations seems to be too little, too late. These associations do not appear well grounded at the village level and seem to be an initiative of the project rather than a genuine grass-roots level initiative. They do not enjoy any autonomy and the supervisor hired by the project to oversee the work on the sand dune stabilization belts is still seen as the key person responsible for all decisions regarding the management of the trees. The seven-member committee do not appear empowered regarding management decisions is not playing a proactive role in making those decisions. While some contributions are made by members on a limited scale, there is little indication that the associations will be able or willing to finance and manage the tree plantations after the end of the project. They have yet to establish any formal system for Operation and Management of the wells and water use and have yet to demonstrate that they have the requisite

[7] Highlighted in the supervision reports and the Mid-Term Review report and also see Section V.

management capacity. The evaluation found little evidence that these associations would effectively contribute to building village level institutions capable of managing the sand dune stabilization infrastructure. This casts serious doubt as to whether the trees will survive without continuing financial and management support from TDA. The project has limited expertise in participatory approaches but has not sought the support of available expertise in this respect (e.g. local NGOs).

32. The Tihama Development Authority has not so far provided a comprehensive model for sand dune stabilization that is socially and economically sustainable and hence potentially replicable. The project should determine the actual costs of operating each of the wells so that a realistic estimate can be made of their financial viability. Households in some villages are reportedly paying YER 100 to 300 per month and a preliminary estimate by the evaluation indicated that the annual capital and running costs of a well and associated infrastructure may be over YER 500 per household per month, and so may not be affordable. The Hodeidah Greenbelt can only be sustained by involvement of the Tihama Development Authority or local government, as there are no associated villages to participate in the continued operation and management of the associated irrigation facilities or to protect the trees.

33. The project has not, as yet, had any impact on the policy or regulatory framework in the Tihama or more broadly at national level. The methods of land and water conservation that the project has implemented have not led to the development of policies that might be followed elsewhere in the Tihama or in other parts of the country, which might benefit from similar investments.

34. **Overall Poverty Impact**. With the change to the original list of villages, the population in the project's 47 villages exceeds 12 000 households (a 69% increase), of which 30% resides in the small town of Al Marawah. The mission's analysis indicates that a majority of the households in the project area fall within the IFAD target group. While some project activities clearly benefit the poor, as mentioned above, the poverty impact of the sand dune stabilization efforts is still uncertain. The project could have targeted its sand dune stabilization activities better to poorer villages without sacrificing the technical aspects of stabilization. For example, Bait-ul Hadi could have been included instead of Al Marawah. In addition, lack of real community level participatory approaches from the beginning of the stabilization processes is likely to limit the potential impact of sand dune stabilization on rural poverty and its likely sustainability.

VIII. PERFORMANCE OF THE PROJECT

35. **Relevance of Project Objectives**. The project objectives (paragraph 9) are still relevant to the needs of the target group in Tihama and the country as a whole. First, sand dune encroachment is still a threat to rural livelihoods, while a failure to arrest the decline in ground water levels and increasing salinity will also increase poverty. Secondly, livestock provide a significant proportion of household subsistence requirements and women, as the livestock managers, are concerned with improving livestock productivity as well as with improving literacy, family health and nutrition standards. Improvements are needed and possible. Finally, since the Tihama Development Authority is almost the only agency that is providing any support to the rural communities in the project area an improvement in its performance is one prerequisite for achieving the other objectives.

36. Project objectives are consistent with IFAD strategy in Yemen (as embodied in its COSOP), IFAD's mandate, the Government's objective of improving the standards of living of the rural population and the Interim Poverty Reduction Strategy Paper with its focus on expanding economic opportunities for the poor in the agricultural sector. While preventing further environment degradation in the Tihama area will benefit the whole population, most of whom can be regarded as members of the IFAD target group.

37. **Effectiveness**. The effectiveness of the project in terms of achievement of its relevant objectives at the time of the evaluation is modest. While the project has developed a technical model for the management of natural resources (i.e. sand dune stabilization) there is no evidence at present that this model is sustainable and replicable. The project did not develop appropriate and replicable methods for the conservation of water resources. The well-known technology proposed is being widely

promoted by the World Bank Land and Water Conservation Project in ways that are more advantageous for the farmers; hence few project loans have been made for investment in this technology. In addition, the water conservation research has been less effective than it should have been due to a number of shortcomings of the research programme (see above).

38. The project has gone some way to achieving the objectives relating to improving livestock productivity and improving female literacy and health but achievements were below expectations due to insufficient support provided by the Tihama Development Authority and low likelihood of sustainability. Discussions with the Ministries of Health and Education recently initiated by the project may lead to the continuing employment of the project-financed midwives and a continuation of the literacy classes to enhance the prospects for the sustainability of these investments.

39. There has been an improvement in the Tihama Development Authority's technical abilities in relation to the planning and implementation of sand dune stabilization measures, but not in respect of water conservation, overall project management, including M&E or its ability to support a programme for rural women and community level participation. Further improvement in management requires the introduction of modern management techniques and will require the provision of additional technical assistance and is beyond the scope of the project.

40. **Efficiency**. The absence of project data records showing the costs by component prevents any assessment of the cost effectiveness of the various project components. In addition, the recent vintage of much of the stabilised dunes (tree plantation) prevents a comprehensive ex-post analysis of benefits. A revised estimate of the potential return for the sand dune stabilization component with the mix of crops found currently in the Tihama and project cost data shows that the investment in sand dune stabilization belts should be economically worthwhile, provided: (i) the sand dune stabilization belt prevents sand moving onto productive land immediately; and (ii) the community manages the sand dune stabilization belts when project assistance stops. If the sand dune stabilization belts continue to be managed effectively the efficiency would be high. The analysis shows that about two thirds of the benefits go to the landowners/pump owners, with the sharecroppers and labourers as a group receiving 26-30% and the Government the remainder (5-6%). However, if the communities do not manage and protect the sand dune stabilization belts after the end of the project, which at present appears to be the likely scenario, the investment is not worthwhile (negative returns) and its efficiency is only modest.

IX. PERFORMANCE OF PARTNERS

41. **Performance of IFAD**. While the project design was well targeted, innovative and identified key issues that were essential for sustainability, it did not provide sufficient guidance and options as to the participatory approaches and procedures that would help to ensure the sustainability of project interventions. In addition, insufficient attention was given to other key implementation issues e.g. procurement ceilings and auditing requirements.

42. IFAD's role during implementation consisted of following up and taking actions on the issues that required its attention and carrying out a Mid-term Review. There is no evidence from the supervision reports of IFAD taking action in respect of key failures to comply with the Loan Agreement (see below) nor with respect to the issues of sustainability and timely involvement of local communities. Finally, IFAD agreed to the Government's request to use USD 300 000 from the IFAD loan for the disposal of toxic waste in an area outside the project area (i.e. *Wadi* Surdud) and amended the loan agreement accordingly. This transfer of funds contributed to the lack of resources experienced currently by the project when belatedly it is endeavouring to develop locally based mechanisms for the sustainable management of the sand dune stabilization belts.

43. **The Cooperating Institution (UNOPS)**. Since Loan Effectiveness, there has been an UNOPS start-up mission and seven UNOPS supervision missions, while IFAD carried out the MTR. Five points should be noted: (i) there was considerable continuity of UNOPS personnel throughout the supervision process which is highly desirable; (ii) the IFAD Project Controller/Country Portfolio Manager participated in the first three missions; (iii) supervision missions were reduced for budgetary

reasons from two p.a. to one p.a. from 2000, which was unfortunate because of the continuing need for support (see later); (iv) there was some technical (agronomy) input into the supervision process before the MTR but not subsequently, which is equally unfortunate; (v) beneficiary participation was stressed only starting 2000, which led to the belated establishment of EPDAs; and (vi) mission composition did not include a social scientist/grassroots institutions specialist despite the need for support in this area.

44. The evaluation assessment is that the UNOPS' reporting was comprehensive, regular and adequate with respect to recording and analysing physical achievements. The supervision no doubt was an important element in ensuring timely implementation and many problems were identified during supervision missions and appropriate recommendations made. The CI and IFAD also have to be commended for the flexibility shown in adjusting project design during implementation. Supervision missions, however, gave overall an over optimistic assessment of the status of the project until 1999 particularly with respect to the performance of the management, institution building and beneficiary participation. Also the monitoring of compliance with the loan agreement was incomplete. According to the supervision missions from 1997 to 1999 the project had minor problems, but performance was always improving, although IFAD classified the project as a problem project in early 1998 due to the low rate of loan disbursement. Follow up on recommendations made to ensure their implementation did not lead to significant improvement in a number of key areas of project implementation as shown by the continuing inadequacies of the M&E, the lack of audit reports, lack of beneficiary participation and some non compliance of loan agreement (see below). UNOPS made no overall assessments of project performance in 2000 and 2001, but based on the low ratings for M&E, auditing, quality of accounts and beneficiary participation downgraded assessment of project performance in 2001 and to a lesser extent in 2000.

45. **Government and Government Agencies**. At the time of project design there were no specific Government policies related to poverty reduction[8]. Participation of the rural poor in project design was through a socio-economic survey and beneficiary participation survey using rapid rural appraisal techniques. This survey highlighted the need for participatory development and village level organizations.

46. *Tihama Development Authority*. After a slow start the rate of project implementation in achieving physical targets has markedly accelerated such that the loan is now almost 100% disbursed. However, a number of managerial problems were observed. These include: (i) difficulties in coordinating project field activities carried out by the relevant departments of the Tihama Development Authority, as their heads are senior to the Project Manager; (ii) the lack of terms of reference for most project staff, except the Project Manager, which led to staff being often unclear as to their project responsibilities; (iii) perceived interference by senior management of the Tihama Authority in project implementation; (iv) cumbersome procedures for submitting withdrawal applications both within and outside the Authority and delays in their processing[9]; (v) inadequate draft audit reports for 1998 and 1999; (vi) non-compliance with some key covenants of the loan agreement; and (vi) a lack of delegation by the project management of routine administrative tasks.

47. The technical assistance has had no apparent impact on the managerial performance of staff involved in project activities as the persistent problems reported in the supervision and Mid-term Review reports indicate. Much of the overseas training had limited beneficial impact, as it was inappropriate for many of the participants, covered too many subject areas in insufficient detail and was too theoretical and/or related to conditions that were unlike those in the Tihama[10]. At least USD 110 000 was expended on training staff not involved with project implementation. The M&E unit has not played its anticipated role.

[8] The Government prepared an Interim Poverty Reduction Strategy Paper in December 2000.

[9] The national level officer envisaged at appraisal, but never appointed, could have played a crucial role in speeding up the processing of withdrawal applications in Sana'a.

[10] An assessment of this training was under preparation by the project but was discontinued due to a reported shortage of funds.

48. **Cooperative and Agricultural Credit Bank**. As per CACB records, credit disbursements under the project were at 1,073 loans for a total amount of YER 170.8 million (USD 1.02 million). However, these included 330 loans for YER 54.7 million (USD 0.33 million) given before 30 September 1999 to farmers of areas along Wadi Siham and Wadi Zabid but outside the project villages, for which use of the loan funds was allowed as a special case. All subsequent loans were made for the project area beneficiaries. The repayment rate for project loans was only 62% at 31 December 2001 and there is an urgent need to improve the timely repayment of the loans without which the sustainability of the project-supported lending activities is in doubt. Although required by the Subsidiary Loan Agreement, the Bank has not set up a single Revolving Fund to account for project loan recoveries and their subsequent use to make new loans in the project area.

49. The Cooperative and Agricultural Credit Bank collateral based lending prevents it providing loans to sharecroppers and women. The recent reduction in lending rates will have an adverse impact on the Bank's already difficult financial position. A restructuring programme has been formulated to enable the Bank to become an efficient rural financial institution and IFAD has offered to support the implementation of this restructuring programme.

50. **Implementation of Recommendations**. One measure of the performance of the Government agencies is the extent to which the recommendations of the supervision missions and the Mid-term Review had been implemented by the date of the following supervision mission. While nearly 60% of all the recommendations were either implemented or partially implemented, the proportion decreased with time and was especially low in respect of the Mid-term Review. This last point may reflect the fact that the Mid-term Review tried to address key implementation issues e.g. participation and sustainability with which the project has had difficulty.

51. **Compliance with Loan Covenants and Agreements**. While the monitoring of the compliance with loan covenants was not complete, the Government was not in compliance with a significant proportion of those covenants that the supervision missions did monitor. The assessment of the current compliance by the evaluation mission was that the Government was not complying with 30% of the covenants, including key ones relating to M&E and auditing.

X. RECOMMENDATIONS

52. **Land Conservation**. In respect of sand dune stabilization the Tihama Development Authority should consider the implementation of the following technical and financial recommendations: (i) produce the planned sand dune stabilization manual; (ii) repair localised gaps in the sand dune stabilization belts; (iii) discontinue financing the development of the Hodeidah Greenbelt with project funds; (iv) use the checkerboard system of mechanical stabilization as fences facing in four directions will provide protection for the trees from the changing wind directions in the Tihama; (v) regard sand dune stabilization as a long-term investment, almost in perpetuity, given the scale of the problem in the Tihama hence allocate sufficient resources to develop sustainable models for this purpose and to support the schemes in the short run (see paragraph 51); (vi) develop an approach suitable for the coastal areas, which are the major source of the sand problem and allocate appropriate resources accordingly; (vii) investigate a number of fast growing and productive exotics that have been successful in shelterbelts in *Wadi* Tuban and elsewhere in the region; (viii) undertake a more detailed biological and chemical analysis of the sewage waters, and determine the most suitable course of action for future use of the waters, including assessing their impact on fisheries and mangroves; and (ix) contract a suitable agency to maintain the climate stations.

53. The hydrology section of the Tihama Development Authority, which has the necessary experience, should (i) gradually assume responsibility for the climate stations and downloading the data; (ii) establish a series of monitoring points to chart the movement of sand dunes at sites to include those where the mission has made a record and there are climate stations recording wind speeds and directions; (iii) monitor wells throughout the Tihama, including the 45 project wells as a priority to obtain an accurate picture of any changes to aquifer quality, water table levels and discharge; and (iv) TDA or the Government should commission a new inventory of wells and a hydrogeological survey of

groundwater conditions in the Tihama in order to update the older studies (last done for the whole Tihama in 1986-88) and quantify the status of present groundwater use and likely future consumption.

54. **Sustainability of Current Sand Dune Stabilization Belts.** With respect to this major issue the evaluation recommends the following: (i) remaining project funds should be devoted to developing, supporting and testing the management capacity of the existing Environmental Protection and Development Associations and establishing them where they do not yet exist; (ii) the project should initiate dialogues with and seek support of the Governor of Hodeidah, the Agricultural Co-operative Union, the newly elected Local Councils to assess the extent to which these organizations can help to support community mobilization at the village level for the maintenance and financing of the sand dune stabilization belts; (iii) the project should seek the services of an experienced and recognized local NGO to help in strengthening the existing associations and in supporting the formation of new ones, whenever possible, while examining the most effective modalities to ensure their managerial and financial autonomy; (iv) the project should establish the actual costs of operating each of the wells and maintaining the sand dune stabilization belts so that a realistic estimate can be made of their financial viability; (v) support to any future sand dune stabilization activities should be conditioned by the success of the project in developing a viable model of community participation that shows that the sand dune stabilization belts will be sustainable after the end of the project.

55. **Water Conservation**. The donors should consider a unified approach to providing farmers with on-farm water saving technology, since the project's approach is much less attractive to farmers than that used by the World Bank. To avoid reducing groundwater levels, seawater intrusion and a continuing rise in salinity of the water used for agriculture, the water supply for Hodeidah may have to be augmented by desalinised water. There is still a need to undertake a comparison of different conveyance systems and the use of bubblers and drip under farm conditions. All future research activities sponsored by the Tihama Development Authority should be undertaken with full participation of the Agricultural Research and Extension Authority.

56. **Support for Rural Women**. The Tihama Development Authority should demonstrate how its activities in support of rural women can be made effective and sustainable by implementing the following recommendations: (i) provide the female extension staff with two additional vehicles on a full time basis; (ii) introduce gender equity in respect of the staff incentive allowances paid; (iii) provide the refresher training for female extension staff envisaged at appraisal; (iv) discontinue the construction of the livestock demonstration pens; (v) provide a full inventory to the female extension staff of all inputs provided as these staff are unaware of the location of many items reportedly delivered to the villages; and (vi) recruit qualified women staff to provide the leadership required.

57. The commendable dialogue initiated with the Ministries of Education and Health should be followed-up to ensure the effective use of the extension staff trained in adult literacy, nutrition, family health, and develop a long-term arrangement for the effective deployment of the project-trained midwives. These arrangements should also consider the provision of basic equipment and supplies required by the midwives at the village level and introduce an element of cost-recovery that will ensure sustainable service provision by them at the village level. The project should identify teachers at the village level and help them develop a sustainable model for the delivery of adult literacy and primary education for girls in the villages through the introduction of affordable school fees, etc.

58. **Credit**. To ensure that the Cooperative and Agricultural Credit Bank does not face any funding constraint to meet future credit demand during the rest of the project period, the project and the bank should jointly assess, as a matter of priority, what action should be taken to provide any additional funds, if project lending cannot be met from the repayments of existing project loans. To improve disbursements of loans for water conservation and for rural women, the Bank should urgently review its loan eligibility and increase the ceiling for collateral free loans, use informal intermediaries such as savings and credit associations and self-help groups[11], and employ female credit officers. To improve

[11] A start is being made under the IFAD-assisted Al-Mahara Rural Development Project and similar arrangements have been agreed for the proposed Dhamar Highland Areas Participatory Development Programme.

the low repayment rates for project loans Bank branches should introduce concerted efforts through follow-up visits and loan recovery campaigns. The Bank should withdraw the instructions to the project area branches (including Bajil, Beit-el-Faki and Hays) to maintain a branch level separate Revolving Fund and instead take steps to set up one consolidated Revolving Fund and to maintain an up-to-date record of recoveries of project loans and their deployment for re-lending. This will also ensure that recoveries of past loans to farmers outside the project area are re-lent to project area villages. Early implementation of the entire restructuring initiative, which IFAD plans to support under the proposed Dhamar Highland Areas Participatory Development Programme, would help the Bank become a sustainable financial institution.

59. **Management Support for Tihama Development Authority**. Future short-term technical and managerial training should be based on a training needs assessment and not exclusively overseas, with outside trainers brought in where necessary and use made of the Authority's considerable facilities. Future project activities need a strong Project Management and Finance Adviser and an M&E Specialist to help introduce and institutionalize modern management methods. The project manager should also have greater seniority to facilitate the coordination of project activities implemented by the departments and sub-regions.

60. The project should immediately identify key indicators so the Project Completion Report can include an assessment of the impact of the project. In addition, the incomplete training report should be finalized. The M&E unit should be provided with the resources envisaged at appraisal so it can complete these tasks. The Cooperative and Agriculture Credit Bank should provide a socio-economic profile of the borrowers to assess project impact. The Tihama Development Authority should undertake an economic analysis based on site-specific data to establish the economic viability of the sand dune stabilization belts. In future, monitoring and evaluation should be an integral part of the department responsible for project implementation and should function as an effective support for project management and not seen as a donor requirement.

61. **Project Design**. As the project is of a relatively old design vintage many of the recommendations concerning design are already incorporated in other ongoing projects in Yemen. Project design documents should include the details of the participatory process to be followed, including the arrangements at village level, who will undertake this work; and a sufficiently detailed analysis to demonstrate that the organization(s) to be involved have the capacity and experience to carryout the work involved. Adequate and experienced Non-Government and community-based organizations should be identified from the start and the participatory processes initiated from the very beginning of project implementation.

62. Project design documents should specify: (i) a requirement for the project to record project costs by component as well as by category of expenditure so management can compare project costs by component with the design estimates; (ii) greater specificity concerning the audit requirements; (iii) a review of the Government procurement procedures to ensure compatibility with the IFAD procurement guidelines; and (iv) cost recovery/sharing arrangements for project-financed services should be included as part of the design.

63. **Project Implementation**. IFAD needs to review the adequacy of resources to the Cooperating Institution to give the support required during implementation. Two full supervision missions a year are necessary with the presence of technical specialists (including social scientists) when required. Supervision must include a focus on: (i) the implementation of the subsidiary agreements and monitoring compliance with loan covenants; (ii) addressing the issue of beneficiary participation and targeting from the start of the project; (iii) ensuring that the resources proposed at appraisal and needed for implementation are provided[12]; and (iv) the resolution of issues relating to procurement, delays in submission of withdrawal applications, M&E, auditing etc. In addition, IFAD needs to take

[12] The increased allocation for credit during the parliamentary review may explain why some of the resources originally intended for the support for rural women and M&E were not provided to the detriment of their performance.

prompt action in respect of non-compliance with the loan agreement if the problems identified are not to continue to hamper project implementation as has happened with this project.

64. **Options for Future IFAD Assistance to the Tihama**. One option for IFAD would be to continue to assist the Tihama Development Authority with sand dune stabilization. The evaluation cannot support this option unless the project provides clear evidence in the remaining implementation period of sustainability and economic viability of the completed sand dune stabilization belts (see recommendations made in this respect, paragraph 51). As discussed with project staff, TDA and other partners at the time of the field evaluation and during the wrap up meeting, evidence at that time for such a sustainability were not favourable (the various reasons are stated in this summary and the main report). One of the main reason is that the EPDAs were not formed from the very beginning of sand dune stabilization process and the communities had little real involvement and say throughout the various stages. No clear evidence was found to indicate commitment on the part of local communities to sustain the existing schemes.

65. Other options for IFAD support based on the analysis of current experience could include: (i) support for rural women in one or more *wadis* with similar components to those included under the present project's Support to Rural Women with a focus of livestock, including forage production, water supplies, rural financial services, literacy and primary health care; and (ii) support for agricultural services to strengthen extension, adaptive research, rural financial services and animal health and plant protection services targeted at the smaller land and pump owners and their sharecroppers. However, any new initiative for IFAD in the Tihama must involve the potential beneficiaries during the design phase and throughout thereafter and should be consistent with the strategic thrusts outlined in the 2000 Country Strategic Opportunities Paper and other considerations relating to the IFAD lending programme.

The Republic of Yemen
Tihama Environment Protection Project (330-YE)
Interim Evaluation

MAIN REPORT

I. INTRODUCTION

A. Evaluation Background

1. The Government of Yemen requested IFAD in 2001 to consider providing financial assistance for a second project to assist with the protection and development of the agricultural resources of the Tihama after the current project, the Tihama Environmental Protection Project (Loan YE-330), ends (the loan closes in June 2003). The Near East and North Africa Division of IFAD requested the Office of Evaluation to undertake a comprehensive evaluation of the project before considering a possible second phase project. Therefore, an Interim Evaluation Mission[13] visited the Republic of the Yemen from 2 February to 4 March 2002.

2. The objectives of the mission were to assess the: (i) achievements of the project so far and their effects and impacts on the target groups in relation to the original parameters defined in the project design; (ii) extent to which the project has achieved its objective of developing a sustainable framework for natural resource management that can be replicated in other areas of the Tihama; (iii) identify future options for IFAD and Government cooperation in the Tihama; and (iv) derive lessons from this project experience for the benefit of similar interventions. Appendix 1 gives the mission's terms of reference.

B. Approach and Methodology

3. The mission was the first to use IFAD's new common framework of evaluation criteria, which has a greater emphasis than previously on impact assessment. The criteria to be used are broadly consistent with the emerging consensus on evaluation criteria[14] among the International Financing Institutions[15] and the Development Assistance Committee of OECD. However, IFAD will use "impact" to mean the **immediate** results at the end of implementation and their likely sustainability, whereas the International Financing Institutions reserve "impact" for the later consequences of a project as its effects mature.

4. The criteria to be used are: (i) **Rural Poverty Impact** covering six domains of impact and one criterion for sustainability and replicability; (ii) **Performance of the Intervention** consisting of relevance of objectives, effectiveness and efficiency; and (iii) **Performance of the Partners** including IFAD, the Cooperating Institution, Government and its agencies, NGOs/CBOs and cofinanciers. The methodology has two sets of ratings for capturing project performance. Each scale has four steps, to avoid "fence sitting" and the scales are symmetrical (i.e. there are two positive and two negative ratings, and the distance between ratings is conceptually equal). The sets are: High, Substantial, Modest, and Negligible; and Highly Likely, Likely, Unlikely and Highly Unlikely. A matrix is used to summarize the results of the rural poverty impact, sustainability, effectiveness, innovation and replicability aspects of the evaluation.

[13] The mission was organized and supervised by Ms Mona Bishay, (Senior Evaluator from IFAD's Office of Evaluation) with the following membership: Michael Rayner (Team Leader/Economist), Dr Hamdi Eisa (Farming Systems), Andreas Gerrits (IFAD Associate Professional Officer/Monitoring and Evaluation), Bal Godbole (Rural Financial Services/Institutions), Ms Maliha Hussein (Rural Sociologist/Gender) and Neil Munro (Land Conservation/Sand Dunes).

[14] The following criteria are recommended: relevance, effectiveness (the extent an aid activity attains its objectives), efficiency, impact and sustainability.

[15] The evaluation criteria are: relevance of objectives, efficacy (achievement of objectives), efficiency, sustainability, and bank and borrower performance (an agreed criterion for institutional development is under consideration).

5. The evaluation process was as follows. First, in 2001 two desk studies were prepared, one to review the socio-economic aspects of design and implementation and the second to prepare a project profile summarising the design features, implementation progress and issues. Discussions were also held with the IFAD Country Portfolio Manager for Yemen. Secondly, in January 2002, the IFAD Senior Evaluator visited Yemen to prepare for the evaluation and to explain the new IFAD evaluation approach to Government and project staff. During this visit the Core Learning Partnership (CLP)[16] was established. This group will review the work of the evaluation mission and agree on the main conclusions, lessons learnt and recommendations to be included in the Agreement at Completion Point. Thirdly, the Senior Evaluator subsequently prepared an approach paper, including the proposed evaluation issues, for discussion with the Country Portfolio Manager and for submission to the CLP prior to the visit to Yemen of the evaluation mission.

6. Fourthly, the evaluation mission visited Yemen in February/March 2002. Upon arrival in Sana'a, the General Director of Planning and Monitoring in the Ministry of Agriculture and Irrigation (MAI), briefed the mission as to the Ministry's priorities for the evaluation namely the sustainability of project interventions and the impact of the expenditure on technical assistance and training. During a visit to the Tihama the mission held extensive discussions with the Chairman of the Tihama Development Authority (TDA) and the staff engaged in project activities, the Regional Director of the Cooperative and Agricultural Credit Bank (CACB) and bank staff working in the project area. The mission also held discussions with the chairman and staff of the Agricultural Research and Extension Authority (AREA) in Dhamar. The mission's fieldwork was participatory with Yemeni counterparts involved throughout. The mission visited 25 villages (16 in *Wadi* Siham and nine in *Wadi* Zabid) out of the 47 project villages and held extensive discussions with over 360 beneficiaries, both men and women. The discussion was based on an open-ended questionnaire to guide the process. At the end of the fieldwork the mission discussed its initial findings with the Chairman and staff of TDA. The mission also briefed the Governor of Hodeidah about its preliminary findings.

7. After the visit to the Tihama the mission prepared an Aide-mémoire, which presented the mission's preliminary findings and conclusions. A wrap-up meeting held in Sana'a on 3 March 2002, chaired by the Deputy Minister of Agriculture and Irrigation and attended by members of the CLP, (and other representatives of the implementation agencies) discussed this aide-mémoire. Thereafter, the mission prepared this Interim Evaluation Report.

C. Country Background

8. The Republic of Yemen was formed in May 1990 through the unification of the Yemen Arab Republic and the People's Democratic Republic of Yemen. The country covers 537 000 km^2 in the southwest corner of the Arabian Peninsula. The estimated population is about 18.3 million (2000) growing at a rate of 3.5% p.a., with nearly half the population under the age of 15 and about 25% of the labour force unemployed. According to the 2001 UNDP Human Development Report Yemen is one of the poorest countries in the world with a HDI ranking of 133rd and Gender Development ranking of 131st out of 162 countries. Yemen suffers from endemic poverty because of a poor resource base and high rates of population growth. Poverty affects 30-40% of the population but over 80% of the poor live in rural areas. Two characteristics distinguish Yemen from other low-income countries: modest oil revenues, nearly 90% of exports and 70% of Government revenue, and qat production and consumption, which has a significant affect on the agricultural sector in terms of labour productivity

[16] Messrs Farid Mujawar (Deputy Minister of Agriculture and Irrigation), Anwar Al Harazi (Deputy Minister for Technical Cooperation or representative), Mohamad Yahia Al Gasham (Chairman Tihama Development Authority, Abdulmalik Al Thawr (General Director of Planning and Monitoring of the Ministry of Agriculture and Irrigation), Zain Haig, Project Manager of the Tihama Environmental Protection Project), Mohamad Al Wadan (Chairman of the Cooperative and Agricultural Credit Bank), Mohammed Hassani (IFAD Country Portfolio Manager for Yemen), Mohamed Chaalala, Senior Project Implementation Officer, UNOPS and Ms Mona Bishay, IFAD Senior Evaluator.

and household resource allocation. In 1998, total debt service costs were an estimated 2.6% of export receipts.

9. About 60% of the population depend on agriculture for their livelihood, which contributes about 30% of GDP. Agricultural sector growth averaged 2% p.a. during the late 1990s, well below the population growth rate and the growth rate for the economy as a whole (3.7% p.a. from 1990-97). The arid Tihama plain is the country's most important agricultural area. It consists of sand plains and dunes interrupted by *wadi*[1] flood plains. The Tihama covers an area of about 22 000 km^2 with slopping land about 30-60 km in width and extending along the Red Sea to the west and up to the foot of the mountains in the east. Eight *wadis* intersect the plain and collect run-off from the highlands to the east. The run-off makes its way through incised valleys to emerge on the coastal plain, where the water is used for spate irrigation and recharges the alluvial aquifer (the largest in the country) for urban and domestic water supply and irrigated agriculture. Rarely, small amounts of runoff reach the Red Sea.

10. IFAD has financed 15 projects in Yemen with loans totalling over USD 136 million. Four projects are under implementation, while a sixteenth has recently been appraised. Past IFAD assistance has covered most aspects of rural development and a consistent theme has been institutional strengthening as weak institutional capacity has been recognized as limiting project implementation.

D. Origin of Project

11. Following a special programming mission in 1987 a general identification mission from FAO/IC, on behalf of IFAD, identified the encroachment of sand dunes as the most serious threat to the Tihama's irrigated agriculture. The management of IFAD found a sand dune stabilization project of particular interest, because it focussed on environmental degradation, while having a potential impact on the rural poor, and approved a two-phased project preparation by FAO/IC. Project preparation took place in 1990 and 1991 and recommended a series of measures to address the overall problems of environmental degradation. IFAD subsequently appraised the project and the IFAD Executive Board approved the loan (YE-330) in April 1993. However, the loan only became effective at the end of 1995, due to delays in: (i) obtaining Parliamentary approval, which necessitated a reallocation of the loan and in particular an increase in the allocation for incremental credit; and (ii) the negotiation of the Supplementary Loan Agreement between the Ministry of Finance and CACB. The seven-year project implementation period now ends on 31 December 2002 and the loan closes on 30 June 2003.

II. MAIN DESIGN FEATURES AND IMPLEMENTATION RESULTS

A. Project Rationale and Strategy

12. **Project Rationale**. The Tihama is the largest and most important agricultural region in the country, which since the 1970s has benefited from five IDA financed irrigation development projects as well as bilateral assistance. Wind erosion, sand dune encroachment and over abstraction of groundwater were jeopardising these investments. The region offered various opportunities for sustainable development and an improved standard of living for the rural population, which included: (i) increasing the productivity of crop and livestock production; (ii) improving the efficiency of the use of irrigation water; and (iii) increasing the supplies of firewood and drinking water and enhancing health care and nutrition. These opportunities could realistically be achieved within the life of a project, if the threat of sand dune encroachment could be minimized so that the land and water resources could be managed in a sustainable way with the full and active participation of the beneficiaries.

[1] A run-off valley is called a *wadi.*

13. To be comprehensive and sustainable, environmental protection would also have to improve the productivity of activities undertaken by women and develop their existing agricultural and livestock skills. The introduction of low-cost time saving technologies could alleviate the major constraint, the availability of time, which prevents women from participating in development programmes. Health care and nutrition were special concerns of rural women and literacy would be a pre-condition for their acceptance of external messages.

14. Attention to strengthening management capacities and monitoring and evaluation procedures, including the provision of technical assistance and staff training, would be essential to ensure effective implementation of the project activities and develop replicable models.

15. **Strategy**. IFAD's strategy in Yemen focuses on the mobilization of resources in support of agricultural and rural development activities designed to assist the poorest farmers, entrepreneurs and rural women. Within this overall strategic framework, the project strategy focuses on: (i) stabilising sand dunes in threatened areas; (ii) improving existing irrigation practices and on-farm conveyance and distribution systems; (iii) carrying out irrigation efficiency experiments to evaluate and develop appropriate technologies; (iv) introducing extension services for household food production and processing, providing village water tanks and initiating literacy and health education campaigns; (v) introducing animal husbandry, health extension and veterinary services; and (vi) enhancing technical and managerial capabilities of the TDA.

B. Project Area and Target Group

16. **Project Area**. Most of the Tihama consists of sand plains and dunes interrupted by *wadi* flood plains. Of the 300 000 ha cultivated two-thirds is rainfed and the balance irrigated. Two-thirds of the irrigated area benefits from ground water irrigation and the remainder from perennial springs and *wadi* floods or spate irrigation. Groundwater levels are declining as abstraction from the aquifer exceeds recharge. The majority of the agricultural population is either sharecroppers or casual labourers. Cereals, forage and cotton followed by fruit and vegetables are important crops, while livestock provide about 20% of the agricultural output. Women are responsible for the care and management of livestock. Cutting and over-grazing have degraded much of the natural vegetation and the control of wind erosion by natural vegetation.

17. Institutions with agricultural development responsibilities in the project area include: (i) TDA, a semi-autonomous body under MAI, which is responsible for implementing agricultural projects, for a broad range of extension services and for maintaining the irrigation and other infrastructure in the Tihama; (ii) AREA which is now responsible for agricultural research and for national coordination of extension services; (iii) CACB which provides rural credit and operates in the region through five branches under the control of the Regional Office at Hodeidah; and (iv) the cooperatives under the umbrella of the National Cooperative Union (NCU).

18. The project area was specified as 47 villages with their farmland that lie within 2 km of the contact zone where the inter-*wadi* sand plains and the *wadi* flood plains meet in *Wadi* Siham and in *Wadi* Zahid. The length of the contact zone is about 70 km, with around 35 km in each *wadi*. In this zone large areas were under an immediate threat from sand dune encroachment, groundwater resources were being over-exploited in many places and large numbers of households were amongst the poorest in the Tihama.

19. **Target Group**. At appraisal there were 7 100 households in the 47 project villages (plus some dispersed farms), with a high concentration of sharecroppers and farm labourers. In most villages, 50% of landless households relied on irregular work as daily agricultural labourers and the rest were sharecroppers or, in a few cases, had off-farm employment. Before the Gulf war work opportunities in the Gulf States provided employment for some of these landless households. The appraisal mission

also estimated that over a longer period (beyond the end of the life of the project), a total of 20 600 families would benefit from the sand dune stabilization component.

C. Goal, Objectives and Components

20. **Project Goal**. At the national level the project has an overall goal of contributing to the Government's **programme** for improving the standards of living of rural people.

21. **Objective**. The primary objective of the project is to identify and demonstrate, by implementation on a limited scale, appropriate and replicable methods for the management of natural resources to support sustained and increased agricultural production. The **project's specific objectives** are to: (i) prevent further encroachment of sand dunes on to farming land; (ii) increase water use efficiency for cropping and livestock in the areas most threatened by encroachment of sand dunes; (iii) increase livestock productivity; (iv) improve women's literacy, family health and nutrition standards; and (v) improve the capacity of TDA to plan, implement, monitor and evaluate the project and other donor and Government financed projects. To achieve these objectives project design includes **four components** described below.

22. The **Land Conservation** component (47% of project costs) would provide resources, including TA, and training to TDA to: (i) stabilize dune fronts through the construction of fore-dunes and by afforestation with Mesquite (*Prosopis juliflora*) with seedlings produced in project nurseries; (ii) drill about 14 wells and install irrigation water distribution systems to meet the water needs of trees planted and construct roads to give access to the trees and irrigation systems; and (iii) assess the speed of sand sheet and sand dune migration using photography and by monitoring wind velocities, grain sizes and the amount of sand in the wind at different heights. These investments were to provide an environment that would enable villagers to plant shelterbelts around their irrigated fields and adopt improved agro-forestry practices.

23. The **Water Conservation** component (11% of project costs) would: (i) demonstrate modern irrigation technologies namely closed pipe conveyance systems (PVC pipes) and drip and bubbler distribution networks; (ii) provide credit through CACB for farmers to purchase water conveyance materials, seasonal crop inputs and farm implements to improve well-to-farm and on-farm water use and crop production; (iii) support AREA to undertake on-station and on-farm adaptive research on crop water requirements, water saving technologies and appropriate saline-water tolerant crops; and (iv) provide TA for development of the crop production techniques required and their extension.

24. The **Support for Rural Women** component (17% of project costs) would: (i) improve family health by providing village water tanks, health education and extension services in food production and processing techniques; (ii) provide literacy teaching for women and girls; (iii) improve livestock production through the provision of animal health and husbandry extension, veterinary services and the establishing of fodder trees; and (iv) provide credit through CACB to women to enable them to hold on to their young stock, buy stock to fatten and purchase production inputs.

25. The **Management Support for TDA** (25% of project costs) includes: (i) the construction and equipping of a training centre to provide comprehensive in-service training for TDA staff and farmers; (ii) development of stronger monitoring and evaluation procedures and capacity; (iii) support for project management including the provision of TA, training and equipment, a national level liaison officer and the introduction of improved financial procedures and management techniques; and (iv) support for the formation of farmer cooperatives that would be critical for beneficiary participation and the sustainability of sand dune stabilization.

26. **Project Costs, Phasing and Financing**. Over a seven-year implementation period, the estimated project costs (inclusive of contingencies) was USD 11.7 million and the IFAD loan USD 9.8 million with the Government contributing USD 1.8 million and UNDP 86 000.

D. Implementation Partners and Arrangements

27. The Ministry of Agriculture and Water Resources, now MAI was assigned overall responsibility for the project at the national level with the TDA responsible for implementing project activities, except for the credit and research activities. The responsibility for the management of TDA rests with the Chairman of the Board of Directors. TDA was to implement the project through its existing structures and the Sub-regional Directors for the Central and Southern regions were to implement field level activities within the two *wadis.* A TDA Project Liaison Officer, based in Sana'a, was to facilitate the actions required by other national agencies and to assist in procurement and financial management.

28. TDA was also to appoint a full-time Project Manager responsible, through the Director General, to the Chairman for ensuring that project activities are included in coordinated annual work plans and that the management units complete their tasks as planned. A Project Operations Committee, under the chairmanship of the Director General with senior TDA staff and representatives of the cooperatives in each *wadi* as members, would meet monthly to review progress and resolve implementation difficulties. The existing M&E unit would be responsible for the M&E system that would have three parts: (i) input/output monitoring; (ii) ongoing evaluation; and (iii) impact evaluation.

29. **Credit and Research**. A Subsidiary Loan Agreement between TDA and CACB was to specify the role of CACB in the project and the mechanisms, terms and conditions and criteria for project lending. CACB would apply the same eligibility and security criteria for the provision of project loans as it was using under the existing IFAD Agricultural Credit Project in the Tihama. For **research** a Subsidiary Agreement between TDA and AREA, would include a planned programme of research to be undertaken by AREA on behalf of, and in association, with TDA.

30. **Beneficiary Participation**. Beneficiary participation was identified as essential for the sustainability of project activities e.g. maintenance of the sand dune stabilization tree plantations. At the time of appraisal very little attention had been given to developing grass-roots organizations in the project area as these were outside the ambit of TDA's routine programmes. The low levels of education and lack of knowledge of development options and management practices among the villagers were identified as further difficulties in developing such organizations. To tackle these problems the project would support the establishment of cooperatives within the project area with the assistance of the Hodeidah branch of the NCU. Once formed, the cooperatives would work closely with TDA in planning and implementing the land conservation works, with the objective of ultimately assuming the management role five years after the first planting in each area. A Subsidiary Agreement between TDA and NCU prepared before the start of the project would detail the role of the cooperatives and the relationships between them and the project participants.

E. Major Changes in Policy and Institutions During Implementation

31. There have been no major changes in policy and the institutional arrangements since the start of project implementation. Similarly, the roles, responsibilities and organization of TDA, CACB and AREA have remained unchanged. The Ministry of Agriculture and Water Resources has become the MAI with the responsibility for water resources being assigned to the National Water Resources Authority. Finally, local councils have recently been elected but have yet to have any impact in the project area, although they could possibly have a role to play in future in the maintenance of project investments.

F. Design Changes During Implementation

32. Implementation of the project has been characterized by flexibility in respect of the original design with some significant changes, since the start of implementation in 1996, more than three years after appraisal. These changes can be summarized as follows:

- During the parliamentary review of the project, after the loan was signed, the allocation for incremental credit was increased from SDR 250 000 (3.6% of the loan) to SDR 750 000 (10.6%). Originally, loans were part of the water conservation and support for rural women components. The purposes for which these incremental credit funds could be used was widened to include other activities compatible with the project objectives and CACB regulations.

- While 45, not 47, villages are the sites for sand dune stabilization activities some of the villages included at appraisal have been replaced. No explanation for the changes can be found in the Supervision or Mid-Term Review reports. At least eight of the villages replaced do not have a sand problem so their exclusion was logical, but eight of the original villages excluded lie close to the sand belts.

- The original proposals for TA involving the employment of UNVs and short-term international TA were revised and five experienced long-term specialists from Sudan recruited reportedly at a comparable cost per person month to that of employing UNVs. The project also financed the salary of the Chief Technical Advisor when the Tihama V Project finished and an M&E specialist for a year at the start of the project.

- The proposed construction of the fore-dunes was dropped following the recommendations of the TA and a consultancy study of the *aeolian* sand formations of the Tihama due to the high costs of construction and environmental risks, which were considered to outweigh the expected benefits.

- A major programme of short-term overseas training was introduced at a cost of over USD 800 000.

- The project design recommended the use of *Mesquite* (*Prosopis juliflora*) for planting in the sand dune stabilization belts but due to the invasive nature of this plant and the difficulty of preventing it encroaching the adjoining arable land it was replaced by a range of other species (planting *Mesquite* is now banned).

- The arrangements for introducing beneficiary participation to ensure sustainability of project activities through the establishment of cooperatives and a subsidiary agreement between TDA and the NCU as proposed in the Loan Agreement were dropped.

- Under pressure from the Governor of Hodeidah the project introduced a sand dune stabilization belt to protect the town of Hodeidah from sand encroachment even though it is outside the project area and does not protect any of the project's 47 villages. Part of this shelterbelt is irrigated by sewage water.

- The proposed appointment of a liaison officer at national level was found to be unnecessary and the proposal was dropped.

- Project allowances for TDA staff working on project-financed activities were introduced to improve staff motivation with the cost reimbursed from the IFAD loan.

33. Finally, Schedule 2 of the Loan Agreement was revised in September 2000 to take account of the expected over expenditure under the Civil Works and Technical Assistance and Training categories and the increased allocation made for Incremental Credit. These increases were accommodated by reducing the Unallocated category and reducing the allocations for Vehicles, Equipment and Materials and Incremental Operating Costs (Appendix 2, Table 1).

G. Main Implementation Results

34. **Loan Disbursements** (Appendix 2, Table 1). Despite the two-year delay in effectiveness and slow start to project activities, prior to the recruitment of the TA in mid-1998, loan disbursements have accelerated from 14% in April 1998 to 99% by mid-February 2002, more than a year before the loan closing date, with only SDR 56 194 remaining, equal to about USD 75 000. Disbursements for civil works, vehicles, equipment and materials and technical assistance and training have exceeded their revised allocations by 12%, 5% and 8% respectively, while that for incremental credit and incremental operating costs were 80% and 48% respectively of their revised allocations. Disbursements include USD 300 000 (SDR 237 000) paid from Category 4 (Incremental Operating Costs) to FAO in May 2001. This sum was to part finance the costs of toxic waste disposal (agricultural chemicals) in *Wadi* Surdud as provided for in the amendment to the Loan Agreement of 8 September 2000, which also revised Schedule 2.

35. In addition, to the remaining balance in the Loan Account, the Government has allocated YER 50 million i.e. about USD 294 000 at the current exchange rate for project activities in 2002. Of this total YER 35 million is for labour and related costs and YER 15 million for other expenditure including fuel, materials etc. These allocations exclude the cost of the salaries of TDA staff assigned to project activities as these are financed as part of the regular TDA budget.

36. **Project Expenditure**. The project does not record expenditure by component, only by category of expenditure. As a result it is not possible to make any comparison of project expenditure by component with the appraisal estimates, without reanalysing the project's accounting records. The absence of project expenditure data by component deprives project management of an important monitoring tool namely the ability to compare budgeted and actual expenditures by component. Unfortunately, the appraisal report (Main Report paragraph 3.111) did not mention the need to keep records of project expenditure by component (included in recent appraisal reports in the writer's experience) and the Loan Agreement is silent on the subject.

37. **Physical Achievements**. Apart from the record of disbursements the only other information that the project has produced on a regular basis and included in the supervision reports is data on physical progress including a comparison with the project targets[17]. Appendix 2, Table 2 provides this information on an annual basis up to October 2001 (later data was unavailable), taken from the supervision reports and grouped where possible to provide a summary of these achievements by component[18]. Most of the supervision reports also compared the annual achievements with the targets included in the annual work programme and budget[19].

38. *Land Conservation*. Compared with the targets set at appraisal, the project's performance is impressive and much experience has been gained which should be documented. For example, the project has drilled wells and installed pumps at 45 sites of which 27 irrigate sand dune stabilization

[17] Mainly set at appraisal but in some cases introduced and/or revised subsequently: most relate to the provision of inputs and implementation of physical structures due to the nature of the project accounting and monitoring systems.

[18] The supervision reports do not present this data by component, the presentation and contents vary and the data provided does always agree with that reported by field staff. Annex 1-D of the Supervision Reports lacks data on the number and type of loans disbursed and the number and type of project supported adaptive research and trials.

[19] Not in 2001.

shelterbelts, while the remainder provides drinking water or are used for other purposes[20]. In addition, the project has installed 65 km of buried irrigation mains, constructed and/or rehabilitated 264 km of roads, established shelterbelts on 1 340 farms (3 800 of irrigated land protected) and planted 62.5 km of sand dune stabilization tree belts with 300 km of fencing. The standard checkerboard system of mechanical stabilization has proved to be the most effective in complementing the trees when establishing sand dune stabilization belts. There is a need to repair small localized gaps in the stabilization belts, to develop an approach suitable for coastal areas, which are the source of the sand problem and where the sand, water and wind conditions are especially difficult and to use existing studies of sand movements to decide where new sand dune stabilization belts are needed to fill the gaps in the existing belts (see below). Given the scale of the sand problem in the Tihama investment in sand dune stabilization will continue to be needed for a long-time.

39. Since many of the trees in the sand dune stabilization belts were only planted during the last three years they will continue to require irrigation after the end of project period. Based on TDA's five-year irrigation schedule almost all the 989 ha of trees planted before October 2001 will require irrigation until the end of 2003. This figure will subsequently decline with 247 ha requiring irrigation until the end of 2004 and 92 ha until the end of 2005, two and a half years after the loan closes.

40. *Wadi Siham*. The belts along the northern border of *Wadi* Siham are somewhat disjointed and do not link up into a single planted belt. Despite this they protect sections of the Sana'a road that were previously subjected to sand sheet and dune drifting. Several sites though are remote and lie on rainfed cropped sandy lands. Progress in sand dune stabilization has been mixed, with effective measures in some locations. The south Siham belt ends 4 km short of the coast just where sand supplies increase dramatically, as coastal dunes move aggressively inland. If the coastal dunes are stabilized then the inland farms may be saved. There is sufficient head in the water tank to feed an irrigation network for some distance towards the coast to halt the movement of the coastal dunes.

41. The 12 km of the Hodeidah Greenbelt established by the project does not protect agricultural land in project area villages from sand dune encroachment, although protecting parts of the city. As a result project funds should not finance the continued development of the Greenbelt.

42. The 19.45 km belt along the southern margin of *Wadi* Zabid has effectively stopped the northerly advance of the sand dunes. This belt needs to be extended eastwards to the main road and along the margins of the farmland towards Hays and westwards to the coast at Mutayna where the project has drilled two wells but not planted any trees. The use of date leaf fences to stabilize the dunes and protect the young seedlings has been crucial in dry and windy areas.

43. The long-term TA helped refine the designs of the sand dune stabilization belts, including the choice of tree species and mechanical stabilization methods used, while short-term TA prepared an inventory of the sand dune stabilization tree belts and made proposals for their future management. However, further investigation of trees species used successfully elsewhere in the region is still needed. There were also two technical studies[21]. The monitoring of winds and sand movements envisaged at appraisal was delayed and the subsequent management of the operation inadequate and disappointing. As a result it has yet to contribute to the design of the stabilization measures. However, TDA (Hydrology Department) should now implement a programme of monitoring of wind speeds, wind directions and sand movements using the equipment provided by the project (climate stations and the field instrument for monitoring sand movements). Section VII.A provides detailed recommendations.

44. *Water Conservation*. The project has only made a small contribution to increasing the water use efficiency because CACB disbursed only 22 loans in the project area for water conservation using

[20] Of these about eight are definitely located outside the project area.

[21] Aeolian Sand Formations of the Tihama: Geomorphology and Assessment of Sand Stabilization Programmes and Study of the Integrated Drainage Systems of the Tihama Plains and Wadi Basins.

PVC pipes, while the project did not test alternative technologies e.g. portable aluminium pipes and high-pressure hoses or drip or bubbler irrigation systems under farm conditions. The project has had little impact on fodder production, crop diversification or changes in the farming systems to improve the efficiency of water use. The TA team conducted experiments to resolve some technical issues e.g. depth of planting, size of cuttings, water requirements and salinity levels but the lack of equipment (e.g. rain gauges etc.) and any statistical analysis means that many of the research results are only indicative and subject to interpretation. Of particular interest is the use of sewage water from treatment lagoons that only receive natural aeration to irrigate trees in the Hodeidah Greenbelt. The trees are vigorous but a build up of salinity, an accumulation of heavy metals (mercury and cadmium), nitrates and phosphates and ground water contamination may create problems in the future and a detailed chemical and biological analysis of the sewage water is needed. Using modern technology, treated sewage water is used successfully for irrigation in the Gulf cities and in Mumbai in India. Project financed research activities were further hampered because the cooperation between the project and AREA did not materialize as planned with each party blaming the other. Extension activities by project staff were limited to PVC pipe installation, advice on shelterbelts, animal husbandry (see also under support to rural women) and plant protection.

45. Despite drilling 45 wells TDA has not monitored water levels in these wells, which is very disappointing, creates a data gap that can never be replaced, and is contrary to what was expected at appraisal. Given the concerns about over abstraction of groundwater there is a need for regular monitoring of the project wells, a new inventory of wells and a hydrological survey of the Tihama to update earlier studies.

46. *Support for Rural Women.* The implementation of the rural women's component only began in the second half of 1998 due to the delay in the recruitment of staff and TA. A lack of transport also slowed implementation until mid-1999 and the provision of credit did not start until the beginning of 2001.

47. However, TDA should be commended for its efforts to develop its team of female extension workers and for the recruitment and training for two years of 22 women to work as midwives who started work in the project area in 2000. Extension staff have received some training in adult literacy, family health, food processing, livestock production, forest extension, but none of the regular refresher training has been provided and the quantity of training provided, excluding the training of the midwives, is only 21% of the total envisaged at appraisal. Implementation has benefited from the TA: a female veterinarian, a female doctor and a nutrition/home-economics specialist. However, only 63% of the TA for the Literacy, Family Health and Nutrition sub-component was provided, while that for the management of the component was never recruited. In addition, the work of the female staff was, and is, severely restricted due to the lack of supplies, equipment, transport and a lack of leadership at the central level. In addition, staff are unaware of the location of the inputs provided by the PMU. Female staff suffered from a low level of motivation due to the lower incentives provided to them under the project.

48. Overall the achievements of the component have been limited and only 100 women have received project-financed loans through CACB, while there is significant double counting in the outreach figures claimed by project staff. However, some activities have made an appreciable impact on women's workload, productivity and self-confidence e.g. the provision of domestic water supplies, interest free livestock grants and the literacy classes. The project did not properly invest in evolving sustainable or replicable models for the adult literacy activities or the provision of health services.

49. *Management Development of TDA.* As envisaged at appraisal, TDA implements the project through its regular structure at headquarters in Hodeidah and in two of the Tihama regions (centre and south) with an autonomous Project Management Unit (PMU) based at HQ responsible for planning, financing and coordination. There are also two regional coordinators responsible for project activities one in each of the *Wadis*, Siham and Zabid. The introduction of staff incentive payments has helped motivate staff and contributed to the impressive implementation of physical works. However, project

implementation has not been without managerial problems, which the supervision reports and the Mid-Term Review (MTR) have highlighted.

50. The existing M&E unit is responsible for monitoring project activities but lacks resources with only three staff and has not received the inputs envisaged at appraisal. The assessment of the physical progress of the project is the only regular monitoring that takes place but this is not always up to date and there is no assessment of the social and economic impact on the beneficiaries. M&E and it is not yet an integral part of the management of project activities.

51. TDA staff have been assisted by 174 months of long-term TA between 1998 and 2001 from five Sudanese specialists. This total excludes the Chief Technical Adviser, the M&E adviser present at the start of the project and national TA. The TA for management and finance was never recruited. The project has financed the construction of a large training hall but it is not yet in use due to a dispute with the contractor. The investment in overseas training of nearly USD 800 000 provided training to 163 staff[22], at an average cost per employee of USD 4 900. Most courses were of 1-1.5 months duration.

52. **Beneficiary Participation**. Community participation, as envisaged at appraisal, has not been implemented by the project. Inexplicably the project management (and presumably UNOPS and IFAD) seemed to have assumed that the NCU referred to in the Appraisal Report, meant local councils and as these were being reorganized when implementation started, the appraisal proposals were not followed. Villagers confirmed that project staff had discussed project activities with them and, in many cases, the *Aqel* and other villagers. However, this interaction could not be construed to be community participation as envisaged at appraisal. The villagers indicated that they were not involved in the design of the project and did not know why the sand dune stabilization-belts had been located on their present sites. The villagers also indicated that they had not been consulted on the selection of tree species and no discussion had been held with them regarding the subsequent management or ownership of the trees.

53. The project has involved communities because the farmers on whose land the trees are planted have to agree prior to start of planting. At many sites, this participation was secured by offering the landowners jobs as pump-operators, guards and hiring family members to irrigate the tress. Other villagers were also involved in project activities through employment as irrigation workers on a rotational basis. With high levels of unemployment there was a high demand for the jobs created by the project but who decided who was recruited and how the jobs were shared is unclear.

54. The project management has recently promoted the establishment of Environmental Protection and Development Associations (EPDAs) at the village level to manage and finance the sand dune stabilization belts when project assistance finishes, with eight established by the end of February 2002. These Associations consist of seven members selected from the village. Under guidance from the project, these Associations have started a savings fund through cost recovery for domestic water supply provided from the project financed wells, establishing collective livestock enterprises and deductions from the salary of workers working on the sand dune stabilization belts.

III. RURAL POVERTY IMPACT

A. Introduction

55. At appraisal the project area comprised 47 villages with a population of 7 100 households. The project management has subsequently changed the original list of villages and the mission estimates that the current population in the project's 47 villages exceeds 12 000 households. However, 30% of this population resides in the small town of Al-Marawah in *Wadi* Siham.

[22] This number and cost excludes the cost of training CACB staff.

56. The population in the project area has limited access to basic social services and little has changed in recent years. Agricultural production is constrained by a lack of water and inability of farmers to invest. Almost all the inhabitants of the project area derive their income from agriculture, very few have secondary jobs, few off-farm employment opportunities exist and employment within agriculture is characterized by significant under-employment. Many farming households indicated that the increase in population posed significant problems for their limited resource base. Women were particularly concerned about the lack of education and health facilities for their children.

57. The population can be divided into three main categories namely: land and land and pump-owners, sharecroppers and daily labourers. Those owning both land and pumps are considered to be the better-off households in the project area. Secondary data sources imply that more than 35% of the families in *Wadi* Zabid live below the poverty line, while it is estimated that 55% of the families do not own any land. Using illiteracy as a proxy indicator shows that there may not be much social differentiation within the project area. Appendix 2, Table 3 provides some data in relation to project achievements derived from project records.

B. Impact on Physical and Financial Assets

58. A technical assessment of the benefits from sand dune stabilization measures indicates that the project is at present protecting 815 hectares of land, which will increase to nearly 4 000 ha (excluding the Hodeidah Greenbelt which does not protect agricultural land) when the trees reach maturity i.e. 20 years. If the stabilization belts halt sand dunes encroaching at the rate of 10 metres per year (a conservative estimate based on project area measurements) 19 ha of land will be saved by year 20 for every 1.0 km of trees planted. The mission's calculations show that at present a maximum of 1500 households or 12% of the project area households might be benefiting from the investments in sand dune stabilization.

59. The general location of the sand dune stabilization shelterbelts was based on the proposals in the appraisal report but TDA staff decided on the exact locations based on their experience and local knowledge, but as far as can be ascertained without using any formal criteria. As already noted local people were not consulted and their knowledge was not used in the design of the dune stabilization belts. Lack of beneficiary participation has led to a lack of ownership of project activities and increased the uncertainty about the sustainability of project investments. Discussions with more than 360 men and women in 25 project villages indicated that it was unlikely that local people would manage the sand dune stabilization belts or accept responsibility for their maintenance at the end of the project period.

60. While a majority of the villagers see the benefits as simply a reduction in the amount of sand blowing in the wind, the real benefit is the avoidance of the loss of agricultural land due to the encroachment of sand dunes. Many of the sand dune stabilization belts are perceived as being too far away to offer effective protection to the village or the trees are still too small but many of the stabilization belts have only recently been planted. In villages immediately threatened by the sand dunes, the benefits of protection are more perceptible but these villages do not always feel adequately protected because the location of the trees does not provide protection throughout the year. For villagers to see immediate benefits the trees need to be adjacent to their fields but this may not always be the appropriate location.

61. The project has also provided seedlings to 1 340 farmers for planting as on-farm shelterbelts. The shelterbelts are highly valued as they reduce the damaging effects of wind on growing crops while the water used to irrigate the fields they protect sustains their growth. With the area of land benefiting from protection from wind is a function of the height of the trees there would be an advantage in coordinating the location of on-farm shelterbelts with that of the sand dune stabilization belts to maximize the benefits of reduced wind velocities.

62. **Rural Credit**. CACB has provided 743 loans for a total amount of YER 116.1million (USD 0.69 million) in the project area. Of these 22 were for water conservation technology using PVC pipes and 100 were for women, much less than anticipated at appraisal. The poorer households are reluctant to apply for CACB credit due to their inability to meet the collateral requirements, the high transactions costs, the lengthy approval procedures and the high interest rates. A survey by the project indicated that only 11% of the respondents in the project area were interested in a loan from CACB. Women have had little access to CACB credit due to the low ceiling for collateral free loans and the requirement of land collateral for larger loans. Women do not generally own land and as such a woman cannot fulfil this requirement without the support of her husband or another male household member. The same is true of sharecroppers who can qualify for a loan only if the landowner is willing to offer his land as collateral. Thus while in theory the project improved access to credit through CACB only 6% of the households in the project area have obtained loans from CACB under the project. Given the small number of borrowers there has been no significant impact on the financial assets of the households in the project area. With almost all the IFAD loan disbursed the only funds available to make new loans are those generated by the repayments of the existing project loans.

63. Mission's field work indicated that: (i) borrowers have generally benefited from the loans which have generated sufficient income to not only cover the CACB debt service costs but also to improve their standard of living; and (ii) borrowing households, although all landowners, can be classified as poor although they are not among the poorest households. An analysis of the socio-economic profile of 499 borrowers from the project area indicated that the average landholding of these households was 19.5 *maad*, (6-7 ha) livestock ownership was limited to a small herd of animals and their off-farm income was YER 2 905 (USD 17) per month.

64. Other impacts (albeit small in extent) have been: (i) improved road access where the roads constructed and/or rehabilitated to provide access to the sand dune stabilization belts and their associated irrigation infrastructure have also provided access to markets and or other social or economic facilities; and (ii) the potential avoidance of property loss due to their protection from encroaching sand dunes.

C. Impact on Human Assets

65. It appears from an assessment in the field that the project has not had an impact on the nutritional status of children because it has not improved access to food availability or changed incomes in a manner that has influenced consumption patterns in any sustained manner. The increase in income that has accrued as a result of the employment provided by the project was for only a part of the year and declines as the trees receive less irrigation each year after planting. The current level of employment provided by the project, which for most will not be permanent, is not substantial enough to make a marked difference to consumption patterns.

66. The provision of potable water has had a marked impact on the women in some villages. The project estimates that 2 425 households have benefited from this amenity and have saved from one to three hours per day collecting water where a close source was not previously available. In villages where an EPDA has been established households are reportedly paying YER 100-300 per month for water from the project wells to the EPDA[23]. However, they have yet to establish any formal system for O&M of the wells and have yet to demonstrate that they have the requisite management capacity. Both the poor and non-poor households have benefited equally from the provision of potable water.

67. The project has enhanced women's access to basic health services through the provision of the services of a female doctor and training and location of 22 midwives in project villages. The female extension staff have also provided health care advice with overall an estimated 3 500 households benefiting. While project activities have improved access of village women to health care, the impact

[23] This figure is not consistent with the average monthly income of the EPDAs which is reported as YER 3 000 to 3 600.

is limited due to the lack of medicines and equipment. The outreach of the female doctor and the midwives based in small towns is also limited because of the lack of transport. If these services are to continue after the end of the project either TDA or the Ministry of Health will have to finance the costs of providing this service.

68. Project reports indicate that 1 300 girls and young women have participated in the female literacy classes organized by the project. Interviews with village women indicated that most of the girls who had attended these classes can now read and write. However, these classes are unable to make a substantial difference to their lives, as they are not linked to any income generating activities. The major impact of these classes is that it gives women a measure of confidence. The lack of sustainability of the literacy programme has limited its impact, as there is no mechanism for the programme to benefit other women in the villages targeted or to extend the programme to other villages.

D. Social Capital and People Empowerment

69. The project has had a very limited impact on social capital formation or people's empowerment partly because the project did not implement the beneficiary participation aspects included in the project design. As a result, the communities have passively received most of the project benefits. The project has belatedly established the EPDAs. However, these organizations do not appear to be well grounded at the village level and seem to be an initiative of the project rather than a genuine grass-roots level initiative. The EPDA as a vehicle of people's empowerment is as yet untested and the mission found no evidence that these would contribute to building social capital at the village level. The only impact of the project on social cohesion was the manner in which the beneficiary population has extended the water supply systems to individual households in a few villages.

70. Despite the activities initiated for women their impact has been extremely limited and has not changed the gender-equity balance in the project area. In the context of rural Yemen it is unrealistic to expect a small project to have the type of influence that is needed to improve the gender-equity balance. The prevailing social norms regarding women's roles and responsibilities present such an overwhelming constraint to women's development and empowerment that women's status is unlikely to improve until these norms change in a fundamental manner.

71. The project staff maintain that the project has stemmed the tide of out-migration in some areas and many families have returned to the project areas as a result of project activities. However, no evidence was found to support this contention. While a few families had changed the location of their residence within the project area this was due to the provision of water supply and not as a result of the impact of sand dune stabilization activities as contented by project staff.

E. Food Security (Production, Income and Consumption)

72. The impact of the sand dune stabilization belts in terms of protecting land from the encroachment of sand is still limited and there has therefore yet to have a significant impact on food security in the areas adjacent to the sand dune stabilization belts. In addition, the project has had little impact on fodder production, crop diversification or changes in the farming systems in the project area. Changes that have taken place are in response to exogenous economic factors such as the ban on fruit imports and the increasing salinity of the irrigation water in *Wadi* Siham. The project was designed to make a difference to farming practices particularly in terms of the water conservation. It was expected that the project would enhance people's skills and knowledge about water conservation practice through investments in irrigation and would impact livestock production through advise on animal husbandry and health care. As already noted the up-take of the irrigation investments has been low and the project has had little impact in terms of research and extension in relation to crop production.

73. While the outreach of the livestock extension advice is estimated to have covered 2 500 households, the uptake of livestock activities has been much more limited due to the financial constraints faced by households in the project area. The women who have received the interest free livestock grants have been able to develop a sustainable enterprise even when this activity was undertaken for the first time. There has been some increase in livestock numbers in the project area as a result of project activities and nearly 400 households have increased their livestock numbers or kept livestock for the first time. However, the livestock demonstration pens constructed with project assistance have added nothing of value to the households to whom they were provided.

74. As a result of the lack of employment in the project area, the employment opportunities offered by the project are highly valued by the population. At the start each site employs 40-60 people but once the initial tree planting and irrigation is complete the labour required declines and by the fourth year only 11-12 people are employed part-time at each site. While the project is estimated to have provided employment equivalent to 505 work years, the number of villagers employed at present is an estimated 350 (part-time).

75. The people in the project area are living on the edge of poverty and their food consumption is at a very basic level. Access to food due to the low incomes is a principal problem. It can be assumed that the incomes from project employment were translated into increased food consumption, as the marginal propensity to spend on food is high when incomes are so low. However, this increase in food consumption was small given the few people employed and the small amount of credit disbursed.

F. Environment and Common Resource Base

76. There is a large range of drifting sand problems in the project area. In particular, the project has demonstrated the potential for reducing sand movements, which have been estimated in those areas under threat from encroachment at 9-17 metres p.a. If the rate of encroachment is 10 metres p.a. and assuming the 52.65 km sand dune stabilization belts (i.e. excluding the Hodeidah Greenbelt) are protecting farmland then each year nearly 53 ha of farm land will remain in production that otherwise would have been lost to the encroaching sand dunes[24]. Data from the climate stations shows the beneficial effects of the sand dune stabilization measures and farm shelter belts in reducing wind velocities on the farmland that lies downwind of the trees, which should increase the productivity of the land affected through reduced evapotranspiration and stress on crops, although there is no data on which to quantify this benefit. As already noted 800 ha is already benefiting from the protection afforded by the sand dune stabilization belts and this might increase to nearly 4 000 ha by PY20 if sustainability is ensured.

77. There is insufficient data regarding groundwater hydrogeology in the project area. Past studies have indicated that groundwater levels are declining in the Tihama due to over-pumping and reduced recharge, and that salinity levels are rising in *Wadi* Siham. Increasing use of water by the city of Hodeidah is likely to be a contributory factor. Data was obtained for a large number of the monitoring wells in both *wadis* for the last year and a half, although the project wells have not been monitored as anticipated at appraisal. A preliminary examination of the data shows that there have been both positive and negative changes to the groundwater levels and salinity in recent years. However, the overall assessment based on interviews with farmers is that groundwater quality and quantity are deteriorating to which the project has contributed in a small way through the drilling of new wells and the irrigation of the sand dune stabilization belts. At the same time the positive impact of the project on water conservation envisaged at appraisal has not been realized due to lack of investments in water conservation technology.

[24] This assumes all the sand dunes stabilization belts have been planted where land is immediately threatened by encroaching sand, which is not always the case.

G. Institutions, Policies and Regulatory Framework

78. As a result of the project's support there has been some improvement in the services provided by TDA, which is reflected in the performance of the female extension workers and the abilities of the TDA staff in respect of the technical aspects of sand dune stabilization, monitoring and interpretation of climate data. Project management performance, including M&E has not improved to the same extent.

79. The project has not had any impact on the policy or regulatory framework in the Tihama or more broadly at national level. The methods of land and water conservation that the project has implemented have not led to the development of policies that might be followed elsewhere in the Tihama or in other parts of the country, which might benefit from similar investments.

80. The project beneficiaries have benefited from the reduction in CACB interest rates that has occurred recently. However, the project played no part in this change, which reflected in part the reduction in the level of inflation. The lower interest rates combined with the removal of the subsidy on interest rates provided the Agricultural and Fisheries Promotion Fund has had an adverse impact on the financial position of CACB.

H. Sustainability

81. At present the sustainability of the measures adopted by the project appears to be questionable. While TDA staff have strengthened their technical skills regarding the design and implementation of sand dune stabilization measures they have yet to develop an institutional model for sand dune stabilization at the village level.

82. The failure to implement the approach to beneficiary participation envisaged in the project design has been a major factor. The recent establishment of the EPDAs by the project to enhance sustainability, while a commendable effort, may be too little, too late. These Associations do not enjoy any autonomy and the supervisor hired by the project to oversee the work on the sand dune stabilization belts is still seen as the key person responsible for all decisions regarding the management of the trees. The EPDA seven-member committee did not appear empowered regarding management decisions and neither was it playing a proactive role in making those decisions. There is no indication yet that they will be able or willing to finance and manage the tree plantations after the end of the project, although this should now be tested, hence casting serious doubt as to whether the trees will survive without continuing financial and management support from TDA. The project should also initiate dialogues with the Agricultural Cooperative Union, the local councils and NGOs concerning the possible future management of the sand dune stabilization belts. For those stabilization belts, which are far from any village, TDA may anyway have to take over the responsibility for their continued upkeep as a public good to prevent the destruction of the productive potential of the Tihama.

83. The mission estimated the cost of operating a well, which could supply a village with drinking water and irrigate established sand dune stabilization trees is about USD 3 100 p.a. If a village has 200 households, the annual cost is YER 217 per household per month. Households in some villages are reportedly paying YER 100-300 per month, which at the higher end would cover the estimated operating costs of providing the water. However, including the capital costs for the well, pump, engine and tank depreciated over ten years would add over USD 4 300 p.a. to the annual costs, or YER 301 per household per month. To allow for the cost of well, pump, engine and tank replacement in future as well as the operating costs households will have to pay nearly YER 520 per month, which may not be affordable. The project should determine the actual costs of operating each of the wells so that a realistic estimate can be made of their financial viability.

84. The Hodeidah Greenbelt can only be sustained by involvement of the TDA or local government, as there are no associated villages to participate in the continued operation and management of the associated irrigation facilities or to protect the trees.

85. There are also technical issues concerning how long after planting the trees will continue to require irrigation with project management expecting irrigation to cease five years after planting, although this was disputed by some of the farmers met. Depending upon the site it is likely that some sand dune stabilization belts will continue to require irrigation for ten years and may be longer. After ten years it is likely that the pumps and engines may also require replacement.

86. The water required by the sand dune stabilization belts is a key issue for sustainability. Water resources are declining in the Tihama as abstraction increases. At appraisal the project was expected to use only 1% of the total annual abstraction in the project areas when 14 wells were planned. However, it was also expected that the project would monitor the water tables and salinity of the 45 project wells, which it has not done. By failing to monitor the water tables and salinity and neglecting to enlist the support of the TDA Hydrology Department in this and other monitoring work, the project has taken a risk by assuming that the water supply for the wells and the quality of the water will be sustained without any monitoring.

87. In conclusion, TDA does not currently have a comprehensive model for sand dune stabilization that is socially and technically sustainable and hence potentially replicable. People living on the edge of survival see the trees as competing with them for scarce water and land resources and are unwilling to support them. Support to any future sand dune stabilization activities needs to address these issues.

I. Innovation and Replicability

88. IFAD is the only international financing institution or major donor that is helping to finance sand dune stabilization and as such there is an element of innovation in the project. However, the technology proposed is not new as there had been other similar attempts to establish sand dune stabilization tree belts in the Tihama (e.g. Tufaytah Shelterbelt under Tihama V), while farmers already use mechanical stabilization methods involving the use of crop residues and palm fronds. The innovative aspect of the project was to test the technologies and develop replicable models for land and water conservation that would have widespread application elsewhere in the Tihama.

89. The mechanical and biological fixation methods used are successful in halting the movement of dunes where established in the correct places and in reducing wind speeds as shown by the wind data from the climate stations. While from a purely technical standpoint the project's model for sand dune stabilization is replicable for the interior areas of the Tihama, there are serious doubts as to the sustainability of the sand dune stabilization belts, due to the lack of beneficiary participation, community ownership of the investments and willingness to manage the trees when project assistance ends. As a result TDA does not yet have a replicable model for arresting the encroachment of sand dunes onto arable land.

90. However, the achievements and insights, even where negative, should be written up if they are going to be useful for replication in the Tihama and elsewhere. Unfortunately, the Project Manager stopped the TA team from completing the proposed Manual on Sand Dune Stabilization. The project should now produce the manual for sand dune fixation before extending its operations into new areas.

91. The project has also not developed any replicable models for water conservation. The project promoted a known technology i.e. the use of buried PVC pipes and did not test alternatives such as portable pipes or high-pressure hoses or develop the use of drip or bubbler irrigation. There is a no new replicable model for use elsewhere in the Tihama.

J. Overall Impact Assessment

92. The mission's assessment shows that a majority of the households in the project area fall within the IFAD target group and that most of the project activities benefit the poor. A key question is can project activities aimed at environmental protection be targeted to the poorer groups (i.e. tenants, sharecroppers, labourers and women). While land and pump ownership patterns have skewed somewhat the benefits from the land and water conservation components, the sharecroppers and labourers are not excluded as they also derive their livelihood from the land and are therefore likely to benefit from any project investments that enhance the productivity of the two most scarce resources in the project area. The project could have targeted its stabilization activities better to poorer villages without sacrificing the technical aspects of stabilization. For example, Bait-ul Hadi could have been included instead of Al Marawah.

93. One of the principle benefits from the project is employment. While landowners have benefited more than the others in securing project employment, the landless, tenants, sharecroppers and daily labourers have not been excluded. When employment is provided on a rotational basis there is an element of equity in the distribution of project benefits from employment.

94. While the project has addressed the needs of poor rural women through its interventions in the area of drinking water, health services, literacy classes, animal production and health extension, the project has had only a marginal impact on women and has not really had an impact on the socio-economic status of women. Only the few women who received livestock loans in kind appear to have realized a substantial increase in household income and productivity. However, the livestock grants have generally been given to the most vulnerable households and, where possible, to female-headed households from among the poor.

IV. PERFORMANCE OF THE PROJECT

A. Relevance of Objectives

95. The project was expected to: (i) prevent further encroachment of sand dunes onto farming lands; (ii) increase water use efficiency in the areas most threatened by sand dunes; (iii) increase the productivity of livestock; (iv) improve women's literacy, family health and nutrition standards; and (v) improve the capacity of TDA to plan, implement, monitor and evaluate development initiatives.

96. Failure to achieve the first of these specific objectives (the terminology of the appraisal report) would deprive landowners, their sharecroppers and daily labourers of their livelihood thereby increasing the extent of rural poverty. Similarly, where ground water levels are falling and salinity levels increasing (as is happening at least in some parts of the project area) a failure to stop the decline in water availability and quality will also lead to an increase in rural poverty. The baseline survey identified the presence of sand dunes on agricultural land, a threat of sand dune encroachment and a lack of financial resources for investment as preventing the full use of the land available. The baseline survey also identified that the overwhelming majority of landowners and land and pump owners area were aware of the benefits of using closed pipe conveyance systems for irrigation water. At the time of the MTR this proportion had increased to 100%. The main reason identified that prevented farmers from installing modern irrigation systems was a lack funds and the difficulty of obtaining the necessary funds. Sand dune encroachment is still regarded by the population in the project area villages as a threat to their livelihoods and the lack finance remains a major constraint to installing modern irrigation systems. The first two specific objectives are still relevant to the needs of the target group and the country as a whole.

97. Women are the main livestock managers and livestock provide a significant proportion of household subsistence requirements and are concerned with improving livestock productivity. Other concerns are improving literacy, family health and nutrition standards. These are still areas where

improvements are needed and possible and therefore the third and fourth specific objectives are still relevant to women. The final specific objective is also still relevant since TDA is almost the only agency in the project area that is providing any support to the rural communities and an improvement in its performance is one prerequisite for achieving the other objectives, all of which require the provision of support services to the rural community.

98. Project objectives are consistent with the COSOP as well as Government's objective of improving the standards of living of the rural population and the Interim Poverty Reduction Strategy Paper with its focus on expanding economic opportunities for the poor in the agricultural sector. Further the focus on women and the environment is in line with IFAD's mandate. While preventing further environment degradation in an area will benefit the whole population the mission's analysis indicates that the majority of the landowners as well as the sharecroppers and daily labourers can be regarded as members of the IFAD target group.

B. Effectiveness

99. The project has not achieved and will not achieve in the remaining time available the development of appropriate and replicable methods for the conservation of water resources. The technology promoted e.g. closed conveyance systems using PVC pipes was already well known and being promoted by the World Bank Land and Water Conservation Project in ways that were more advantageous for the farmers. As a result few loans were made in the project area for investment in this technology. In addition, the water conservation research sub-component has been less valuable than it should have been due to the failure of TDA and AREA to carry out a joint programme and because the results of the TDA research are open to interpretation. Key factors were not measured because of a lack of equipment and the results were not subject to any statistical analysis.

100. The project has gone some way to achieving the objectives relating to improving livestock productivity and improving female literacy and health but has failed to achieve as much as it might have done because of the lack of support provided by TDA to this component (support for rural women). In addition, these interventions are not yet sustainable, although TDA has initiated discussions with the Ministries of Health and Education which may lead to the continuing employment of the project financed midwives and a continuation of the literacy classes. Without additional and continuing support in terms of refresher training, transport and managerial and technical assistance the support for livestock production initiatives cannot be sustained and no further benefits in terms of improved livestock productivity realized.

101. There has been an improvement in TDA's technical abilities in relation to the planning and implementation of sand dune stabilization measures, including providing and managing the associated irrigation infrastructure, but not in respect of water conservation where little has been achieved. The objective of improving TDA's overall project management expertise, including M&E, or its ability to support a programme for rural women has not been realized. The remaining time available is insufficient to improve TDA's management abilities, which requires the introduction of modern management techniques and will require the provision of additional TA resources.

C. Efficiency

102. The absence of project records and accounts that show the actual costs by component prevents any assessment of the cost effectiveness of the various project components. No cost comparisons with the appraisal estimates are possible. However, the mission has re-estimated the potential rate of return from the sand dune stabilization component using data for costs obtained from various project sources, recent estimates of the rate of sand dune encroachment in the project area. Two scenarios were used: the first assuming that the sand dune stabilization belts will continue to be managed and maintained, and the second assuming that the stabilized belts will not be maintained. The basis for the analysis is that in the absence of sand dune stabilization belts an area of land would be lost each year starting one

year after the stabilization belt has been established. The net value of the production lost from this area is the benefit of the sand dune stabilization belt, while the investment and recurrent costs of establishing and maintaining the stabilization belt are the costs of stabilising the sand dunes and preventing the loss of productive agricultural land.

103. The main assumptions summarized from Annex 8 are as follows: (i) the estimated cost of 1.0 km of a sand dune tree stabilization belt 100 metres wide is USD 52 150, comparable to the estimate made at the time of appraisal (USD 53 714), (although the methods used have changed with the construction of fore-dunes abandoned); the cost includes trees, mechanical stabilization fences, access road, irrigation infrastructure and labour, operating and supervision costs for five years; (ii) an average rate of movement for the sand dunes of 10 metres p.a.; (iii) net value of crop production based on the mix of crops grown in each *wadi*, taking into account the different cropping patterns in each season, and the different cropping intensities; (iv) wood cut from year ten onwards has been valued as firewood; (v) the communities continue to protect the trees after the end of project support in scenario 1 (base case) or does not maintain the belt (alternative scenario); (vi) no non-agricultural benefits e.g. loss of houses, avoidance of blocked roads etc. are included; and (vii) all costs and benefits reflect their value to the economy, the opportunity cost of capital is 10% and the period of analysis is 20 years.

104. The results are summarized below:

Indicator	***Wadi* Siham**			***Wadi* Zabid**	
Internal economic rate of return	**Mixed**	**Fruit**	**Millet**	**Mixed**	**Fruit**
Base case (sustainability)	12%	20%	-ve	9%	23%
Alternative scenario (no sustainability)	-5%	5%	-ve	-8%	9%

105. The analysis shows that in the base case scenario, assuming sustainability of fixed sand dunes, if the sand dune stabilization belts protect fruit tree plantations (e.g. dates, bananas and mangoes) typical of the relatively well off in the project area, the rate of return is 20% and insensitive to changes in costs and benefits. Where sand dune stabilization belts are protecting land that is irrigated and grows the range of field and vegetable crops cultivated in the project area, typical of the poor farmers, the rate of return is just similar to or in excess of the opportunity cost of capital. A reduction in costs or increase in benefits of 6% from mixed cropping will increase the rate of return in *Wadi* Zabid to 10%, while it would take a 19% reduction in benefits or a 24% increase in costs to reduce the rate of return in *Wadi* Siham to 10%. With both fruit production and mixed cropping the investment in sand dune stabilization is economically worthwhile, provided: (i) the location of the sand dune stabilization belt prevents sand moving onto productive land immediately and not several years or more after the trees are planted; and (ii) the community protects the trees when project assistance stops.

106. However, if the communities do not manage to protect the sand dune stabilization belts after the end of the project, which at present seems likely (i.e. the alternative scenario in the table above), then investment in sand dune stabilization belts is not worthwhile. This is particularly the case for mixed farming in the two Wadis where the ERR is negative. This last scenario also applies to some of the investments made in *Wadi* Siham and definitely to the 12 km of the Hodeidah Greenbelt, which does not protect agricultural land, and has cost an estimated USD 625 000. In the two scenarios if the sand dune stabilization belts[25] protect land that grows only rainfed millet (which is the case for the poorest in the project area) then the rate of return is also negative (-ve).

107. Sensitivity analysis shows that increasing the period that the trees require watering from five to ten years has a minimal effect on the rate of return, because these costs do not occur until PY6 and the extent of irrigation required is assumed to be small i.e. the same as in PY5. The analysis shows that about two thirds of the benefits from avoiding the encroachment of the land dunes goes to the

[25] Data for rainfed millet production is only available for *Wadi* Siham.

landowners/pump owners, with the sharecroppers and labourers as a group receiving 26-30% and the Government the remainder (5-6%) in the form of *zakat*.

108. **Comparison with Appraisal**. The analysis above uses the same approach as that used at appraisal, which gave an internal rate of return of 9.6% for the land conservation component. Two things are surprising about the assumptions in the appraisal report: (i) no benefits from sand dune stabilization were included until PY6 which does not accord with reality because as soon as there is a fence and/or trees sand movements are reduced; and (ii) the land loss avoided thereafter, 4 250 ha along a 70 km length over 13-15 years is the equivalent to preventing sand dunes moving 607 metres i.e. on average more than 40 metres p.a. or 30 metres p.a. over 20 years, which exceeds the highest values reported in the project area. The appraisal analysis underestimated the benefits in the early years, but overestimated the likely benefits subsequently. Actual costs, as far as can be ascertained, would seem to have been similar to those estimated at appraisal.

V. PERFORMANCE OF PARTNERS

A. Performance of IFAD

109. **Key Aspects of Project Design**. Three aspects of project design are particularly relevant to IFAD's mandate and strategic framework namely, targeting, participation and innovation. The premise was that support for developing replicable ways of preventing environmental degradation for subsequent use elsewhere in the Tihama would improve the incomes of the rural poor. The project was therefore targeted at areas considered to be representative of those areas of the Tihama threatened with desertification e.g. areas at the margins of the cultivated land and not at areas known to be especially poor. Project design included a component specifically targeted at women, reflecting the fact that rural women are a prime concern of IFAD, play a key role in agricultural production and are important for project success. The support to rural women's component includes activities of particular concern to women e.g. livestock rearing, drinking water supply, health and education.

110. The project design (Appraisal Report paragraph 4.09) correctly identified that: *The success of the project, leading to its own sustainability and to replication elsewhere in the Tihama would depend on the development of mechanisms for management of activities by the beneficiaries. Very little attention has been paid so far to the development of grass-roots level organizations in the project area, which is outside the ambit of TDA's routine programmes*. The project design also noted (paragraph 4.10) that: *Beneficiary participation in management is most important in the land conservation component, where the maintenance of tree plantations is critical to sustainability of project activities and replicability of sand dune stabilization methods*. The design approach to this concern was to propose that the project would support the establishment of cooperatives within the project area with the assistance of the NCU. Once formed the cooperatives would work closely with TDA in planning and implementing the land conservation work, with the objective of ultimately assuming the management role. The project was to provide assistance to the NCU to undertake this work and the Loan Agreement includes a requirement for a subsidiary agreement between TDA and NCU to cover these activities. Crucially, the project design did not include any details of the processes to be followed in forming or managing the cooperatives at village level nor did it identify the failure of beneficiary participation as a project risk. In the writer's experience more recent project designs include such details in the appraisal report to try and ensure that the provisions of the design (unlike these here) are subsequently followed during project implementation.

111. Relying on agricultural cooperatives to achieve the desired participation was perhaps rather naïve given the generally unsatisfactory experience with cooperatives in so many countries, the lack of any evidence in the project design documents of their success in the project area and the need for sustainable grassroots organizations to be developed by the rural people themselves and not as part of a government supported institution, like most traditional agricultural cooperatives. Surprisingly, the appraisal report has minimal information on the cooperatives (e.g. structure, organization,

management, financial results etc.) that the design was relying on for sustainability. While it is clear that project design was correct to diagnose the need for a significant TA input, no TA team leader or M&E specialist were included in the expertise required, although short-term inputs from a management adviser and a financial adviser were identified as being needed and were to be financed by UNDP.

112. Other aspects of project design worth noting are as follows. First, the existing management structure of TDA would implement project activities rather than a special Project Management Unit (PMU), with the PMU only responsible for planning, financing and coordinating project implementation. Secondly, TDA was supposed to operate the Special Account, which would facilitate the timely availability of funds by avoiding the involvement of another ministry. Thirdly, no project coordinating mechanism e.g. steering committee or similar was included at national level as a national liaison officer was to fulfil this function. Fourthly, drafts of the proposed Subsidiary Agreements were not included in the appraisal report (which in the writers experience happens now) and is one way of helping to ensure that these agreements are consistent with project design and also helps to avoid delays in project implementation while these agreements are drafted, discussed and approved. Fifthly, insufficient attention was given to the incompatibility of the national and IFAD's procurement procedures in respect of the ceiling above which it is necessary to advertise and request tenders. Finally, the auditing requirements were too brief and general. In the writers experience much more detailed audit requirements are now included in the appraisal report.

113. As already noted the project design was, and still is, innovative. The high rate of return from the water conservation component 48% (including the benefits from an increase in the cropping intensity) helped to raise the overall project rate of return to nearly 12%, the assumed opportunity cost of capital at appraisal, despite the 9.6% return from the land conservation component.

114. **Conclusion**. While the project design was well targeted, innovative and identified key issues that were essential for sustainability it failed to provide guidance as to the approach and procedures that would help to ensure that sustainability would be achieved. In addition, insufficient attention was given to other key implementation issues e.g. procurement ceilings and auditing requirements.

115. As UNOPS was the Cooperating Institution IFAD's direct role during implementation was limited to following up and taking action on the issues that required its attention. IFAD also carried out a MTR. There is no evidence from the supervision reports of IFAD taking action in respect of key failures to comply with the Loan Agreement (see below) or to address other implementation issues[26]. Finally, IFAD agreed to the Government's request to use USD 300 000 from the IFAD loan for the disposal of toxic waste in an area outside the project area (i.e. *Wadi* Surdud) and amended the loan agreement accordingly. This expenditure cannot contribute to the achievement of the project's objective and means that the project now lacks funds when belatedly it is endeavouring to develop a mechanism for the sustainable management of the sand dune stabilization belts.

B. Performance of the Cooperating Institution

116. **Supervision Missions**. Since Loan Effectiveness, there has been an UNOPS start-up mission and seven UNOPS supervision missions, while IFAD carried out the MTR. Appendix 2, Table 4 summarizes the timing, duration and composition of the various UNOPS and IFAD missions. Four points should be noted: (i) there was considerable continuity of UNOPS personnel throughout the supervision process which is highly desirable given the short duration of the missions, the issues involved and the need to minimize the learning curve of the staff involved; (ii) the IFAD Project Controller/Country Portfolio Manager participated in the first three missions; (iii) supervision missions were for budgetary reasons reduced from two p.a. to one p.a. from 2000, which was unfortunate because of the continuing need for support (see later); and (iv) there was some technical

[26] The lack of involvement by IFAD after the loan is approved hinders project implementation as responsibility is split between two organizations.

(agronomy) input into the supervision process before the MTR but not subsequently, and no input from social scientists (participation expert), which is unfortunate, and presumably also the consequence of the reduced budget provided by IFAD for supervision.

117. **Project Performance Rating**. Appendix 2, Table 5 summarizes the supervision missions rating of the project's performance. There are not values for all the indicators in every year as UNOPS changed some of the indicators and ceased to provide an overall assessment from 2000. From 1997 to 1999 the overall assessment, on a scale of 1-4 was that the project had minor problems (2) but performance was always improving[27]. However, IFAD classified the project as a problem project in early 1998 due to the low rate of loan disbursement, but this was changed when disbursements subsequently increased following the recruitment of the TA during 1998. UNOPS concluded that the performance deteriorated again in 2000 and 2001, based on the low ratings given for M&E and auditing.

118. It is the mission's view that the UNOPS reporting was comprehensive, regular and adequate as far as reporting on physical achievements. Supervision mission projects' assessments were optimistic throughout for several reasons. First, the M&E system did and does not comply with Section 6.01 (b) of the Loan Agreement. The monitoring data that was provided was largely derived from the progress reports prepared by the TA staff. Secondly, with no audit reports submitted the quality of the audit should have been 4 since this indicator was included in 1999. UNOPS/IFAD should have invoked the provisions of Section 4.05 (c) (ii) of the Loan Agreement and recruited an independent external auditor to audit the project accounts in October 1999 when the project was in default with respect to that covenant of the Loan Agreement.[28]. Similarly, with no records of project costs by component or records of project expenditures included in the supervision reports the quality of the accounts should also have been rated 4. Thirdly, as noted below the project was not in compliance with many loan covenants and as a result should not have been rated 2 or 1 in this respect since 1997 with 3 or 4 more appropriate values. Fourthly, with the deficiencies in auditing, accounting and M&E it seems somewhat inconsistent to accord project management such a high rating (1 for the last three years). Project management was beset by numerous problems as noted below. Similarly, the rating for institution building is too high. While there has been development of the technical capacity of TDA with respect to sand dune stabilization and livestock development, health and education (all part of the support to rural women), overall managerial capacity and financial management remains very weak. The TA identified as being required to help develop these capacities was never recruited and the CTA did not provide the assistance required if that was the intention.

119. Fifthly, giving beneficiary participation a rating of 2 until 2000 was generous, as 4 would have been appropriate, and may have occurred because the provision of employment for members of the target group was equated with beneficiary participation. Nothing was done to comply with the provision in the Loan Agreement in respect of the participation of the cooperatives and the preparation and enactment of a subsidiary agreement with the NCL. In 2000 UNOPS stressed the importance of beneficiary participation that led to the establishment of the EPDAs. It remains to be seen if this commendable initiative can be effective or is too little, too late. Sixthly, no justification has been

[27] Before 2000: 1 = Problem Free; 2 = Minor Problems; 3 = Moderate Problems; and 4 = Major Problems. From 2000 1 = Problem Free; 2 = Minor Problems; 3 = Major Problems Improving; and 4 = Major Problems Not Improving.

[28] Since there is a need for transparency and accountability in respect of the use of IFAD funds it is the mission's view that external auditors i.e. audit companies (and not Government auditors) should audit all project accounts and that for each project an audit company should be recruited within 90 days of loan effectiveness with their terms of reference agreed with IFAD and Government. It seems somewhat surprising that IFAD has not insisted on such an approach as it would help demonstrate to the donors that their funds are being used in a transparent and accountable way. The cost of such audits, if financed from the loan would represent an insignificant proportion of the loan, possibly about 1%. The project's draft audit reports for 1998 and 1999 prepared by the Central Organization for Control and Auditing are not in accordance with the auditing provisions in the appraisal report in respect of the Special Account, statement of expenditures and register of assets. The argument, sometimes advanced, that IFAD should help in the development of Government auditing capacity by allowing project accounts to be audited by Government auditors seems misguided since IFAD is an agency with a mandate for poverty alleviation not for developing auditing capacity. There are better-qualified agencies able to help Governments directly in the essential task of developing their own auditing capacity through the provision of training etc.

provided to give a rating of 2 for the benefits that the project was expected to generate. The UNOPS proposal that the project should establish the benefits of sand dune stabilization through the preparation of a cost benefits analysis was never carried out, while the benefits from the support to rural women component are not as widespread as they could have been.

120. Overall, UNOPS and IFAD have to be commended for flexibility demonstrated with respect to changing design features as required. Other aspects of UNOPS supervision that are relevant are as follows. First, UNOPS rightly agreed to a major change in the composition of the TA team. The proposal for major inputs from UNVs was unwise given the requirements of the project. Also there were too many short-term inputs that would probably have achieved little by way of technology transfer. The change to fewer long-term personnel was a wise decision. Secondly, UNOPS should not have endorsed TDA's decision to establish a greenbelt that protects Hodeidah from the encroachment of sand dunes. This investment was not part of the original project design and has nothing to do with protecting the livelihoods of the poor in the project area from encroaching sand dunes. Thirdly, TDAs proposals for the major overseas short-term training programme should have been reviewed more critically. With the short courses envisaged i.e. only 1-1.5 months but covering a wide range of subject matter it was unlikely that this training would contribute much to the development of work skills that the trainees would use on their return to Yemen, as has proved to be the case based (see later). The overseas training was expensive and one reason why the allocation to Category 3 of Loan was increased. Finally, agreement to pay staff project allowances from the IFAD loan has contributed to the progress of project activities, although there was no gender equity in the payments made.

121. **Conclusions**. Overall the UNOPS supervision missions reported adequately and regularly on physical achievements but gave an over optimistic assessment of the status of the project. While identifying many problems and making many appropriate recommendations to address the issues identified the subsequent follow up to ensure implementation of these recommendations seems to have had little effect on solving several of these problems (see below).

C. Performance of Government and Government Agencies

122. **Rural Poverty Reduction Policy**. At the time of project design there were no specific Government policies that related to poverty reduction. Subsequently, the First Five-Year Development Plan (1996-2000) emphasized increasing the rate of economic growth and financial stability, but did not have a clear focus on the development of the rural poor or a clear vision of poverty alleviation. However, the Government prepared (December 2000) an Interim Poverty Reduction Strategy Paper[29] with three macro-economic objectives namely to: (i) create income-generating opportunities and expand economic opportunities for the poor; (ii) enhance the capacities of the poor and increase the return on their assets; and (iii) reduce the suffering and vulnerability of the poor. Policies identified as necessary include: (i) enhancing the social safety net to relieve the suffering of the ultra-poor; (ii) improving the social conditions and economic productivity of the poor and those close to the poverty line; and (iii) addressing the structural causes of poverty by focussing on poverty prevention and sustainable livelihoods.

123. **Formulation**. The Government, FAO/IC and IFAD conceived the project as an environmental conservation project designed to develop techniques for stabilising the sand dunes that were threatening the productive land in the Tihama, to conserve the limited ground water resources, to support rural women and develop the capabilities of the TDA. The project followed a number of donor-assisted projects that had or were developing the potential for irrigated agriculture (groundwater and spate irrigation). The project design did not specifically target resources to the rural poor.

124. Participation of the rural poor in project design was through a socio-economic and beneficiary participation survey using rapid rural appraisal techniques to identify: (i) the factors accounting for socio-economic differentiation within villages; the poor and determinants of poverty; (ii) the

[29] Government was expecting to finalize the Poverty Reduction Strategy Paper by 30th September 2001.

relationship between resource endowment of the different socio-economic strata and their farming practices; and (iii) approaches to targeting project interventions. The survey also was to assess: (i) the social feasibility of proposed arrangements for building and maintaining conservation works and for recovering the cost of land protection from the owners (as opposed to tenants or sharecroppers); (ii) the social cohesion of the beneficiary population; and (iii) the existing grassroots organizational structures that could be involved in project implementation. Since the survey did not attempt to rank or prioritise the development priorities of the beneficiaries, project design was unable to respond to such identified priorities.

125. In terms of cost recovery the survey found that since most of the landowners were subsistence oriented, project activities would have to increase their incomes before it would be realistic to expect them to contribute to project costs. The survey also concluded that: (i) grass-roots participatory development is crucial for encouraging self-reliance; (ii) this can be achieved by creating and supporting village level organizations which become decision-making and implementing bodies working in coordination with the authorities; (iii) the local councils can act as an intermediary between village-level organizations and the TDA; and (iv) formation of committees for various activities, with a membership comprising those undertaking the activity, should be the approach to the creation of village level organizations.

126. **Implementation**. The project implementing agencies were TDA, which was responsible for most project activities, while CACB was responsible for disbursing the loans provided to farmers in the project area. AREA was to play a role in the adaptive research activities under the water conservation component and the NCU was to assist farmers to form cooperatives. TDA and CACAB implemented project activities through their existing structures and in the case of CACB under the terms and conditions of a Subsidiary Loan Agreement between CACB and the Ministry of Planning and Finance, while AREA and NCU were to undertake specific activities also under formal agreements between themselves and TDA.

127. *Subsidiary Agreements*. The Subsidiary Loan Agreement was finalized in 1998. An agreement between TDA and AREA was finally signed in 1999, but this amounted to no more than an expression of intent and was not a basis for the type of collaborative programme envisaged during project design. As a result AREA involvement in the adaptive research sub-component of the water conservation component was minimal. Finally, there was never any agreement between the NCU, or any similar agency, and TDA with respect to the formation of cooperatives.

128. *Project Management*. After some delay TDA appointed a Project Manager, to head the PMU, who was confirmed in that post in 1997. As already noted after a slow start the rate of project implementation has been impressive such that the loan is now almost 100% disbursed. However, project implementation has not been without managerial problems, which the supervision reports and the Mid-Term Review have highlighted. These include the difficulty the PMU has in coordinating project field activities carried out by the relevant TDA departments, as their heads are senior to the Project Manager. In addition, TDA staff still lack terms of reference, except the Project Manager, despite earlier recommendations for these to be prepared. As a result staff are often unclear as to their project responsibilities, which has contributed to the problems. A logical framework was not prepared as requested by UNOPS in 1997 even though two staff members received the necessary training in Rome from FAO in 1999. To motivate staff implementing project activities the project introduced a system of project allowances ranging from USD 50-800 per person per month.

129. Other problems have been the perceived interference by TDA senior management in project implementation, cumbersome procedures for submitting withdrawal applications both within and outside TDA and delays in their processing, non-compliance with loan agreement in respect of procurement, submission of audit reports and establishment of an M&E system (see below). The national level officer envisaged at appraisal could have played a crucial role in speeding up the processing of withdrawal applications in Sana'a. Project Management is overburdened due to a failure to delegate routine administrative tasks e.g. keeping proper records of reports and other documents.

While draft audit reports were submitted for 1998 and 1999 in February 2002 and that for 2000 is due in March 2002, they do not appear to include the funds disbursed by CACB. There is no management letter or separate opinions on the statements of expenditure and the operation of the Special Account or a register of assets.

130. **Government Counterpart Contribution**. There were at times problems concerning the lack of a government counterpart contribution which was solved in two ways: (i) since most of TDA incremental project operating costs were related to the establishment of the sand dune stabilization belts, using force account procedures, these costs were included under the civil works category and reimbursement claimed from IFAD; and (ii) equipment, services and staff financed as part of the regular TDA budget were used. However, for 2002 Government has provided an allocation of YER 50 million i.e. about USD 294 000 at the current exchange rate.

131. *Technical Assistance and Training*. Despite a range of opinions the long-term TA had a positive impact in the preparation of work plans and supporting and coordinating implementation especially that of two components: (i) sand dune stabilization; and (ii) the support to rural women. Some useful on the job training was provided to TDA staff who should now be able to replicate the technical aspects of land and water conservation unaided. However, the TA has had no apparent impact on the managerial performance of TDA staff involved in project activities as the persistent problems reported in the supervision and MRT reports indicate.

132. While providing an exposure to different situations much of the overseas training[30] did not appear to impact on the work of the trainees when they returned to the Yemen for the following reasons: (i) the participants on a particular course did not all have the same level of qualifications and experience and as a result the training was inappropriate for many of the participants; (ii) the short courses covered too many subject areas and as a result the training was insufficient in any area to develop work skills; and (iii) much of the training was too theoretical and/or related to conditions that were unlike those in the Tihama. In addition, some of the overseas training budget (certainly in excess of USD 110 000 and may be more) was expended on training staff not involved with project implementation. Finally and inevitably, some TDA staff complained of being overlooked when trainees were selected leading to resentment and de-motivation of the individuals concerned. The November 2001 Supervision Mission recommended that the project analyse the results and impact of the training programme and while data has been collected the analysis is incomplete and a report has yet to be produced apparently because of a lack of funds.

133. *Monitoring and Evaluation*. The M&E Unit has been involved in the following activities: (i) providing inputs for the Baseline and Mid-Term Review Surveys and some related studies e.g. a Final Report June 1996-October 2001, which increased the confidence of the Unit to conduct such work; (ii) on occasions, but not always, assisting in the preparation of the Annual Work Programme and Budget (AWPB); and (iii) input/output monitoring. This last activity, which is the only regular activity undertaken, involves the collection of reports from experts, technical divisions and the extension service. The Unit is supposed to compare the data in these reports with the AWPB and the appraisal estimates and to give appropriate feedback to project management. However, no structure is in place to do this regularly and feedback seems to have been provided only rarely. Staff of the Unit attended a number of training courses, which helped to increase their knowledge and capacity (e.g. computer skills).

134. The M&E unit faces a number of constraints. First, it lacks staff with only three people designated to carry out all TDA M&E work. Secondly, there is a lack of computers and transport, which greatly hampers the capacity to collect, analyse and store data properly. Project support for M&E as outlined in the Appraisal Report included one computer and peripherals, two cars and six motorcycles. Currently, the M&E Unit only has one computer in TDA HQ. The single vehicle

[30] The mission interviewed about 30 trainees, both men and women in groups and individually, who participated in all the major overseas training courses, and there was a surprising unanimity of views amongst those met.

received was stolen and not replaced and the motorcycles were not provided. Thirdly, the assessment of the physical progress of the project is the only monitoring that takes place but this is not always up to date and the latest information is for the period up to 31 October 2001. There is no assessment of the social and economic impact on the beneficiaries, which needs to be remedied so that an assessment of project impact can be made at the end of the project. M&E is not an integral part of project activities.

135. **CACB**. Despite a delayed start and the disbursement before end September 1999 of 330 loans (32% of the total) in areas outside the project area, all subsequent loan approvals are for the project area beneficiaries and subject to prior screening by Joint CACB/Project Technical Credit Committees. Loans for improvement of irrigation systems and to rural women are only 6% and 5% respectively of the total. These loans together with those for crop production, which were the core activities identified at appraisal, account for just 31% of the total amount disbursed. This is partly due to the wider scope of lending permitted by the Subsidiary Loan Agreement, which in addition allows lending for all agricultural purposes compatible with the project objectives and CACB regulations.

136. Although required by the Subsidiary Loan Agreement, CACB has not set up a Revolving Fund to account for project loan recoveries and their subsequent use to make new loans in the project area. Instead CACB has established separate revolving funds at the branch level and this deficiency should be rectified immediately. The repayment rate for project loans was only 62% at the end of December 2001 and there is an urgent need to improve the timely repayment of the loans without which the sustainability of the project-supported lending activities is in doubt. In addition, CACB needs to modernize its lending policies and procedures to make them client-friendly, to raise the ceiling for land collateral free loans, and to widen the credit outreach to reach the rural poor including women through informal intermediaries such as savings and credit associations and self-help groups, which in turn would help obviate the need for land collateral[31]. The recent reduction in lending rates will have an adverse impact on CACB's already difficult financial position. A restructuring programme has been formulated to enable CACB to become an efficient rural financial institution and IFAD has offered funding for the implementation of this restructuring programme under the proposed Dhamar Highland Areas Participatory Development Programme. Submission of copies of withdrawal applications made by CACB to the PMU would improve the exchange of information and be beneficial to both parties.

137. **Implementation of Recommendations**. The UNOPS supervision missions and the MTR made many recommendations to improve the performance of the project. One measure of the performance of the Government agencies is the extent to which these recommendations had been implemented by the date of the following supervision mission[32]. The table below provides such an analysis and where a recommendation was still under implementation at the time of the subsequent mission this has been classified as partially implemented, together with those that had been partly implemented.

138. The following comments are relevant: (i) overall the same proportion of the recommendations were implemented as were not, 35%: (ii) a majority, nearly 60% of all the recommendations were either implemented or partially implemented; and (iii) the proportion of recommendations that were implemented decreased with time and was especially low in respect of the MTR. This last point may reflect the fact that many of the supervision recommendations related to simpler, administrative matters where as those from the MTR tried in addition to address key implementation issues e.g. participation and sustainability, M&E, coordination between TDA and CACB etc. which the project has had difficulty in implementing (Appendix 2, Table 6).

[31] A start has been made under the IFAD-assisted Al-Mahara Rural Development Project and similar arrangements have been agreed for the proposed Dhamar Highland Areas Participatory Development Programme.

[32] The figures take into account the fact that in one or two instances the status indicated in the subsequent supervision report was subsequently found to be incorrect.

Date of Supervision Mission	No. of Recommendations Made	Implementation Status by Next Mission: Yes no.	Yes %	No no.	No %	Partly no.	Partly %	n.a. No.	n.a. %
January 1996	8	5	*63*	0	*0*	3	*37*	0	*0*
April 1997	21	10	*48*	3	*14*	7	*33*	1	*5*
October 1998	23	14	*60*	5	*22*	2	*9*	2	*9*
April 1999	38	14	*37*	16	*42*	8	*21*	0	*0*
November 1999	32	17	*53*	9	*28*	6	*19*	0	*0*
Mid-Term Review	51	5	*10*	30	*59*	12	*24*	4	*8*
October 2000	32	12	*38*	9	*28*	9	*28*	2	*6*
October 2001 (a)	21	3	*14*	7	*33*	6	*29*	5	*24*
TOTAL	**226**	80	*35*	79	*35*	53	*24*	14	*6*

Source: UNOPS Supervision Reports, IFAD MTR Report and mission's assessment of the status of the MTR recommendations (Appendix 2, Table 6) and those included in the October 2001 Supervision Report.
(a) = Implementation status as at mid February 2002. n.a. = not yet applicable or data unavailable.

139. **Government Compliance with Loan Covenants and Agreements**. The analysis in Appendix 2, Table 7 shows the extent to which the Government has complied with the terms and conditions of the IFAD loan. The table below summarizes these results and also indicates the extent to which the supervision missions monitored Government compliance. The figures for 2002 are based on the findings of the evaluation mission. A number of comments are appropriate. First, the supervision missions only monitored the Government's compliance with a small proportion of the covenants in the loan agreement and so any assessment of the Government's compliance with the terms and conditions of the loan agreement is incomplete. In addition, it was not always the same covenants that were monitored each time. Secondly, the Government was not in compliance with a significant proportion of those covenants that the supervision missions did monitor. Thirdly, the assessment of the current compliance by the evaluation mission indicated a higher degree of compliance, which would be expected towards the end of a project. Even so the Government was not complying with 30% of the covenants, including key ones relating to M&E and auditing.

Status	**1996**	**1997**	**1998**	**1999**	**1999**	**2000**	**2001**	**2002**
Yes	5	9	6	15	18	10	10	29
No	7	9	9	7	6	8	8	16
Not applicable	9	0	0	0	0	0	0	8
Not monitored	32	35	38	31	29	35	35	0
Total	53	53	53	53	53	53	53	53

VI. OVERALL ASSESSMENT AND CONCLUSIONS

A. Summary of Achievements

140. The primary objective of the project as stated in its design documents (Appraisal report and Loan Agreement) and as understood by implementing partners at the time of the evaluation is "***to identify and demonstrate, by implementation on a limited scale in the project area, appropriate and replicable methods for the management of natural resources to support sustained and increased agricultural production. Support for environmental rehabilitation was expected to improve the livelihoods of the rural poor who are the IFAD target group.***" Despite the project's significant physical achievements during implementation, the evaluation analysis shows that the project's primary objective had not been achieved at the time of the interim evaluation. While the project has developed one model for the management of natural resources (i.e. sand dune stabilization) that would prevent

the loss of productive agricultural land, there is no evidence at present that this model is sustainable and can be successfully replicated. The project has gone some way in achieving the objective of providing support to rural women and to community health through access to drinking water, but it has made little contribution to water conservation. TDA staff have benefited from the presence of the TA, although the overseas training seems to have had little effect on the subsequent performance of the trainees. The major concern is the sustainability of the investments in sand dune stabilization because of the current lack of ownership by the surrounding communities (which have not appropriately participated in site selection nor sufficiently mobilized from the beginning of the process), a continuing need to irrigate the trees after the end of the project and concerns about the future availability in places of suitable groundwater. For the remainder of the project period there is a need to demonstrate that the project achievements can be sustained and replicated and that there are sustainable means of financing the continued costs of maintaining the sand dune stabilization belts.

B. Options for Future IFAD Assistance in the Tihama

141. TDA has prepared a project proposal for a new project for which IFAD assistance would be requested. This proposal involves a replication of project activities in the project area and other *wadis* at a total cost of nearly USD 29 million. Other activities proposed mentioned with the Chairman and senior staff of TDA include protection of mangrove forests, the rehabilitation of the extension centres, provision of animal health and plant protection centres, construction of an irrigation system proposed in 1978 for *Wadi* Surdud, but never constructed, and water conservation in Jabal Ras, Jabal Bura and on Kamaran Island.

142. One option for IFAD would be to continue to assist the TDA with sand dune stabilization. The evaluation cannot support this option unless the project provides clear evidence in the remaining implementation period of sustainability and economic viability of the completed sand dune stabilization belts. As discussed with project staff, TDA and other partners at the time of the field evaluation and during the wrap up meeting, evidence at that time for such a sustainability were not favourable. One of the main reason is that the EPDA were not formed from the very beginning of sand dune stabilization process and the communities had little real involvement and say throughout the various stages. No clear evidence was found to indicate commitment on the part of local communities to sustain the existing schemes.

143. Other options for IFAD support based on the analysis of current experience could include: (i) support for rural women in one or more *wadis* with similar components to those included under the present project's Support to Rural Women with a focus of livestock, including forage production, water supplies, rural financial services, literacy and primary health care; and (ii) support for agricultural services project to strengthen extension, adaptive research, rural financial services and animal health and plant protection services targeted at the smaller land and pump owners and their sharecroppers. However, any new initiative for IFAD in the Tihama must involve the potential beneficiaries during the design phase and throughout thereafter and should be consistent with the strategic thrusts outlined in the 2000 Country Strategic Opportunities Paper and other considerations relating to the IFAD lending programme.

VII. INSIGHTS AND RECOMMENDATIONS

A. Project Components

144. **Introduction**. This section of the report provides recommendations for implementation during the remainder of the project. There are also recommendations that relate to project design and supervision that IFAD and UNOPS should consider in relation to their future operations. Finally, a summary of the insights is presented.

145. **Land Conservation**. In respect of sand dune stabilization TDA should: (i) produce the sand dune stabilization manual planned by the TA and include an analysis of the reasons that some sites were unsuccessful; (ii) repair localized gaps in the sand dune stabilization belts involving mechanical and biological fixation methods; (iii) use the standard checkerboard system of mechanical stabilization as fences facing in four directions will provide protection for the trees from the changing wind directions in the Tihama; (iv) using existing studies look closely at the regional sand movements to determine where to place additional sand dune stabilization belts that were left out of the initial scheme; and (v) for longer term purposes if TDA chooses to invest further in sand dune stabilization there is a need to develop an approach suitable for the coastal areas, which is the source of the sand problem, where the sand, water and wind conditions are particularly difficult and where the use of indigenous species will be important (provided that TDA is willing to incur the cost of their operations and maintenance).

146. TDA should discontinue financing the development of the Hodeidah Greenbelt with project funds and use other sources of finance. Annex 1 includes some detailed recommendations in respect of the future management of the Greenbelt. The project should make a more detailed biological and chemical analysis of the sewage waters, and determine the most suitable course of action for future use of the waters, including assessing their impact on fisheries and mangroves. The project should also investigate a number of fast growing and productive exotics including *Casuarina equisetifolia, Conocarpus lancifolius, Terminalia catapa, Dalbergia sissoo* and *Parkinsonia aculeata* that have been successfully used for shelterbelts in *Wadi* Tuban, and elsewhere in the region.

147. *Monitoring of Winds*. The climate stations financed by the project are now in need of annual maintenance and two sensors at Ash Shalaman need replacement. The project does not have staff able to maintain the climate stations and TDA will have to contract a suitable agency to undertake the work. The hydrology section of TDA, which has the necessary experience, should take control of the O&M of these stations, the transfer of data to the office PC and the regular transfer of the data to the project and the coordinator of the national network in Sana'a. The project laptop computer must be made available on request for field data collection. A schedule of visits to the climate stations by the hydrology section needs to be planned and coordinated with project staff (who regularly visit the sites). In the immediate future the climate station at TDA headquarters should be relocated from Hodeidah to Well 4 in the Greenbelt.

148. *Monitoring Sand Movement*. The project should establish a series of monitoring points to chart the movement of sand dunes. It is suggested these include Mujaylis and Rawiya in the *Wadi* Zabid, and at Shalaman and the Greenbelt (Wells 2 and 4) in *Wadi* Siham. At several of these sites the mission has made a record and there are climate stations recording wind speeds and directions. Measurements should be made using steel rods to chart the weekly or monthly movement of dunes, and these can be related to climate station data. TDA should also use the field instrument, supplied in January 2001, to measure sand movement at different heights. Some TA support is recommended to maintain the momentum of the data collection and analysis.

149. *Groundwater Monitoring*. The TDA hydrology staff should monitor wells throughout the Tihama, including the 45 project wells as a priority and make monthly records so that an accurate picture can be obtained of any changes to aquifer quality, water table levels and discharge. Spares for essential equipment (e.g. dip meters) are available in the TDA stores and other equipment can be obtained through the National Water Resources Authority. Government should commission a new inventory of wells and a hydrogeological survey of groundwater conditions in the Tihama in order to update the older studies (last done for the whole Tihama in 1986-88) and quantify the status of present groundwater use and likely future consumption. Such a survey would benefit many involved in planning and development, and in particular the sustainability of the project and any similar activities in the future.

150. *Beneficiary Participation*. The following recommendations are made with a view of assisting TDA in its attempt to ensure sustainability of the stabilized sand dunes. Remaining project funds

should be devoted to developing and supporting the existing EPDAs and establishing them where they do not yet exist, wherever local communities are willing to do so. Future financing mechanisms could involve, the communities, local councils and/or TDA. The project needs to establish what will be the actual costs of operating each of the wells and maintaining the sand dune stabilization belts, communicate this cost to local communities so that a realistic estimate can be made of their financial viability of the schemes and the beneficiaries ability to sustain them.

151. To facilitate the above mentioned process the project management should: (i) ask each EPDA to outline its plans for the maintenance of the sand dune stabilization belt at the end of the project period; (ii) test the management capacity and sustainability of the EPDA as an institution by handing over the management of some of the sand dune stabilization belts to these Associations; (iii) initiate dialogues with the Agricultural Co-operative Union, the newly elected local councils and local NGOs to assess the extent to which these organizations can help to undertake community mobilization at the village level for the maintenance of the sand dune stabilization belts; and (iv) select a good NGO with experience in community mobilization to help initiate the dialogue with communities regarding sustaining the sand dune stabilization belts.

152. If the measures suggested above do not yield results, which is debateable for stabilization belts remote from any villages or farmlands, such as the unbroken 18 km front from Al Mutayna south to Ras al Haymah, TDA might wish to consider financing the sand dune stabilization belts (at least on selective basis) as a public good to ensure that sand dune encroachment does not destroy the productive potential of the Tihama. The TDA should also pursue the opportunity outlined by the Governor of Hodeidah for the allocation of funds in the Local Council budgets for maintenance of the sand dune stabilization belts. In any case IFAD's support to any future sand dune stabilization activities should be conditioned upon the ability of the project to develop a model of community participation that shows that the sand dune stabilization belts will be sustainable at the end of the project.

153. **Water Conservation**. The donors should consider a unified approach to providing farmers with on-farm water saving technology e.g. buried PVC pipes. The project's approach is much less attractive to farmers than that used by the World Bank Land and Water Conservation Project. To avoid reducing groundwater levels, seawater intrusion and a continuing rise in salinity of the water used for agriculture, the water supply for Hodeidah may have to be augmented by desalinised water.

154. There is still a need to undertake a comparison of different conveyance systems and the use of bubblers and drip under farm conditions. Such an exercise would contribute to the development of replicable and cost effective water conservation technology for use elsewhere in the Tihama. All future research activities sponsored by TDA should be undertaken with full AREA participation.

155. **Support for Rural Women**. TDA should demonstrate how its activities in support of rural women can be made effective and sustainable by implementing the following recommendations: (i) support the female extension staff properly and provide them with additional vehicles i.e. one additional vehicle in *Wadi* Zabid and another in *Wadi* Siham on a full time basis; (ii) introduce gender equity in respect of the incentive allowances paid; (iii) provide the refresher training for female extension staff envisaged at appraisal; (iv) discontinue the construction of the livestock demonstration pens; and (v) provide a full inventory to the female extension staff of all inputs provided as these staff are unaware of the location of many items the PMU claims to have been delivered to the villages. In addition, TDA should recruit qualified women staff to provide the leadership required, i.e. guide activities, discuss targets with the extension staff, assess the quality and content of the extension messages and examine the impact of its activities at the village level before replicating them elsewhere.

156. The commendable dialogue initiated with the Ministries of Education and Health should be followed-up to ensure the effective use of the extension staff trained in adult literacy, nutrition, family health, and develop a long-term arrangement for the effective deployment of the project-trained

midwives. These arrangements should also consider the provision of basic equipment and supplies required by the midwives at the village level and introduce an element of cost-recovery that will ensure sustainable service provision by them at the village level. The project should identify teachers at the village level and help them develop a sustainable model for the delivery of adult literacy and primary education for girls in the villages through the introduction of school fees, etc.

157. **Credit**. To ensure an uninterrupted credit supply until the end of the project period the project and CACB should jointly: (i) estimate the credit demand for the remainder of the project period; (ii) assess how far this demand can be met from repayments of past loans and the extent of any funding shortfall; and (iii) recommend the action that should be taken to provide any additional funds to CACB.

158. To improve disbursements of loans for water conservation and for rural women, CACB should urgently review its loan eligibility and collateral criteria. For instance; (i) reduce the borrower's contribution for irrigation loans from 25% to 10-15% of the total cost with no personal guarantees required when land collateral is provided; (ii) introduce the system of direct payment to a supplier from a panel of suppliers already established and provided to the loan applicant instead of the prospective borrower submitting invoices from three equipment suppliers; and (iii) raise the ceiling for loans without land collateral from YER 50 000, which was fixed over five years ago, to YER 100 000 to cover the full costs of a dairy cow or a unit of 10 sheep or goats to improve women's access to credit. CACB should widen the credit outreach to reach the rural poor including women in a cost-effective manner using informal intermediaries such as savings and credit associations and self-help groups, which in turn would help obviate the need for land collateral[33], and employ female credit officers.

159. To improve the low repayment rates for project loans CACB branches should introduce concerted efforts through effective follow-up visits and loan recovery campaigns to ensure the sustainability of the project-supported lending activities. The transfer of the project-provided vehicle at Hays branch for recovery staff mobility in the project area should complement the above efforts. The recent decision to pay an incentive bonus of 1% of the total amount recovered to credit field officers is a step in the right direction.

160. CACB should withdraw the instructions to the project area branches (including Bajil, Beit-el-Faki and Hays) to maintain a branch level separate Revolving Fund and instead take steps to set up one consolidated Revolving Fund to comply with the provisions of the SLA and to maintain an up-to-date record of recoveries of project loans and their deployment for re-lending. This will also ensure that recoveries of past loans at Bajil, Beit-el-Faki and Hays branches are not relent outside the project area villages and that the redeployment of funds for new loans is demand-driven.

161. The recent reduction in lending rates will have an adverse impact on CACB's already difficult financial position. A restructuring programme has been formulated to enable CACB to become an efficient rural financial institution, which IFAD plans to support under the proposed Dhamar Highland Areas Participatory Development Programme. Early implementation of the restructuring initiative in its entirety would help CACB to become a sustainable financial institution and participate effectively in future rural development operations.

162. **Management Support for TDA**. Future short-term technical and managerial training should be based on a training needs assessment and not exclusively overseas, with outside trainers brought in where necessary e.g. from Sana'a or overseas. TDA has a large new training hall financed by the project and a variety of laboratory facilities. Courses can be tailored to the needs of the trainees so that all staff from a particular group (e.g. graduate hydrologists) are trained at the same time in appropriate subject areas. This approach would be more cost effective than sending groups of trainees on short

[33] A start is being made under the IFAD-assisted Al-Mahara Rural Development Project and similar arrangements have been agreed for the proposed Dhamar Highland Areas Participatory Development Programme.

overseas courses, which may not be appropriate for the needs of all the individuals concerned. Exposure to different situations should be through short study tours and not short training courses.

163. *Project Management*. From a technical perspective any future investments in sand dune stabilization and water conservation could be undertaken without the need for long-term TA. Nevertheless for efficient implementation future project activities need a strong Project Management and Finance Adviser and an M&E Specialist to help introduce and institutionalize modern management methods. The project manager should also have greater seniority to facilitate the coordination of project activities implemented by the departments and sub-regions. In addition, some short-term technical inputs may also be needed. As originally envisaged a national level liaison officer should be appointed to provide the coordination required at national level i.e. to speed up processing of withdrawal applications, procurement etc.

164. *Monitoring and Evaluation*. There is a need to identify key indicators to measure the impact of the project on issues like environment, employment, food security, water management, and family well being and this should be done immediately so the Project Completion Report can include such an assessment. In addition, the incomplete training report should be finalized. The M&E unit should be provided with the resources envisaged at appraisal so it can complete these tasks. Data should be collected using a standardized format to establish the socio-economic profile of the beneficiaries and analysed by the M&E unit. CACB should computerize and analyse the data on the landholding and livestock ownership pattern of each borrower to provide a socio-economic profile of the borrowers at the end of the project and to assess project impact. TDA should undertake an economic analysis based on site-specific data to establish the economic viability of the sand dune stabilization belts.

165. The M&E unit has not fulfilled its expected role and has not provided project management with the timely information and analysis required. In future, M&E should be an integral part of the PMU (or whatever TDA department is responsible for project implementation) as monitoring and evaluation is part of the task of management. A separate unit should not be responsible for M&E for two reasons: (i) those implementing project activities see the M&E staff as policemen and are less than fully supportive of their work; and (ii) an M&E unit is seen as a separate donor requirement and not as an essential and integral part of project management.

B. Project Design and Implementation

166. **Project Design**. For future project design in the Tihama the evaluation recommends that design documents include the following: (i) various options on how effective beneficiary participation can be achieved; (ii) sufficient background information concerning the agency(s) to be responsible for community participation to demonstrate their capability to undertake this task; (iii) greater details concerning the project accounts and records i.e. the need to record project costs by component as well as by category of expenditure; (iv) a review of the Government procurement procedures to identify potential problems concerning their possible incompatibility with the IFAD procurement guidelines; (v) more details concerning the audit requirements e.g. employment of an external auditor (audit company), with auditing in line with International Standards on Auditing, audit reports in a Long Form audit with a separate management letter and a reply to the management letter from the Project Management within one month of the receipt of the audited accounts; and (vi) inclusion of draft subsidiary agreements e.g. SLA in the formulation and appraisal reports so that they are in line with project design and discussed prior to loan negotiations.

167. **Project Implementation**. If not responsible for supervision, IFAD needs to consider increased resources to the Cooperating Institution to provide the support required during implementation namely two full supervision missions per year, each spending two weeks in country and with funds available to include a technical specialist as a mission member when needed. Supervision must focus on: (i) monitoring compliance with loan covenants; (ii) addressing the issue of beneficiary participation and targeting at the beginning of project implementation; and (iii) the resolution of issues relating to

procurement, delays in submission of withdrawal applications, M&E, auditing etc. In addition, IFAD needs to take prompt action in respect of non-compliance e.g. over M&E and auditing, if the problems identified are not to continue to hamper project implementation as has happened with this project.

C. Insights

168. There are four areas where lessons have been learned. These relate to: (i) project design and supervision; (ii) beneficiary participation and sustainability; (iii) monitoring and evaluation and impact assessment; and (iv) provision of credit. The insights are not all necessarily new but the interim evaluation has highlighted the critical nature of these aspects of project design, implementation and impact assessment.

169. **Project Design and Supervision**. Project design was appropriate and innovative with an objective that was relevant for the rural poor in the Tihama. The lessons highlighted here relate to both project design and subsequent implementation support provided by the Cooperating Institution. In the case of design the lesson is that the design documents should: (i) include the details of the participatory process to be followed, including the arrangements at village level; (ii) identify who will undertake this work; and (iii) provide a sufficiently detailed analysis to demonstrate that the organization(s) to be involved have the capacity and experience to carryout the work involved. Failure to comply with these requirements and a project management that is technically rather than people oriented will lead to a lack of beneficiary participation during implementation as has happened in this protect. Similarly, a failure to adequately specify the audit requirements in the design documents and in the Loan Agreement and an absence of terms of reference for the audits will result in inadequate audits as has happened. The experience with using the Central Organization for Control and Auditing highlights the problems of using a Government agency to audit project accounts and desirability of always using external auditors i.e. an audit company with agreed terms of reference.

170. One further lesson relates to the design of the TA input which should include a TA team leader when a large TA team is proposed if a coordinated programme of technical assistance is to be provided, consistent reporting formats followed etc. While UNOPS rightly simplified the TA inputs, introduced a Chief Technical Adviser from another project and cancelled the UNV inputs, it also cancelled the TA management and finance inputs (to be financed by UNDP). If the TA team leader was expected to undertake these functions this never happened as project management and financial problems have persisted to this day. The lesson to be learned is that projects need to use modern management techniques (e.g. planning, budgeting, accounting, monitoring etc.) and that if necessary, as in this case, appropriate TA should be provided.

171. Some of the effects of the inadequacies of project design can be minimized if project supervision is rigorous, compliance with loan covenants properly monitored and action taken when there is a lack of compliance in crucial areas e.g. M&E and auditing. While a lack of resources for supervision has no doubt contributed to the problems faced by UNOPS with this project, the absence of detailed proposals for beneficiary participation at village level in the appraisal report could have been mitigated if UNOPS had focused on this aspect of project implementation from the start of the project and if UNOPS and IFAD had insisted on the implementation of the proposed subsidiary agreement with NCU. A further lesson concerns the need during supervision to insist that the resources proposed at appraisal and needed for implementation are provided. The failure to follow this course of action in respect of the support to rural women component has seriously reduced the outreach and impact of that component and similarly had an adverse impact on the capability of the M&E unit.

172. A final lesson concerns the need to include cost recovery/sharing arrangements for project financed services as part of the design. TDA has now initiated discussions with the Ministry of Health concerning the continued employment of the midwives trained and employed by the project once project funding ceases and also with the Ministry of Education. Some element of cost recovery could

have been included for the services of the midwives while use could have been made of existing teachers who were willing to continue and/or expand the literacy classes which would have facilitated a continuation of the services started with project assistance.

173. **Beneficiary Participation and Sustainability**. Project implementation has highlighted what has been known for some time now from experience in many countries namely that project investments must be owned by the beneficiaries, if these investments are to be sustained once project/Government resources are no longer available. The failure noted above to implement the original design proposals for beneficiary participation, or to implement some alternative arrangements, has seriously compromised the chances that the sand dune stabilization belts which are technically sound from being sustainable. Without community involvement in the management of the sand dune stabilization belts e.g. for the continued irrigation of the trees, management of the trees (use dead wood for firewood and/or felling of mature trees) etc. the belts will fall into a state of disrepair and become useless. The decline of and near failure by neglect of the Tufaytah Shelterbelt, established in 1983 with World Bank assistance, has demonstrated what happens with out community involvement and this experience must not be repeated. While the project has belatedly recognized the need for community involvement, the formation of the EFPDAs may be a case of too little, too late as there are serious doubts about their ability to fulfil the role envisaged for them. Communities should have been mobilized from the very beginning and fully included in site selection and selection of stabilization methods. Where the location of sand dune stabilization belts is of necessity far from any villages other funding arrangements will have to be devised if the productive potential of the Tihama is to be protected.

174. **Monitoring and Evaluation and Impact Assessment**. The lesson learned is that M&E should be an integral part of project management and not undertaken by a separate unit. In addition, projects must record project expenditure by component and not just category of expenditure so that an analysis of the cost effectiveness of project interventions by component can be assessed (e.g. a comparison of the cost per unit with the appraisal or other estimates) and subsequently a cost benefit analysis undertaken where this is appropriate e.g. for components that aim to increase production and/or productivity of crop and/or livestock production. Such an analysis also requires information of the impact of project activities, which the project has failed to collect even though it was part of the original design. The only monitoring information available relates to the provision of project inputs and some outputs e.g. length of sand dune stabilization belts etc.

175. **Provision of Credit**. The following lessons from project experience would benefit future rural credit operations: (i) when the scope and allocation for credit is increased significantly during implementation, supervision missions should examine the loan eligibility and collateral criteria and widen the availability of credit to the target group; (ii) the design of credit programmes for the rural poor, especially women, should include specific interventions to increase their access to credit e.g. capacity building, community participation, training etc.; and (iii) project design should include inter-agency coordination between the agencies responsible for project implementation, at both top management and field levels to avoid delays and serious implementation problems.

APPENDICES

APPENDIX 1

TERMS OF REFERENCE

Objectives

During the period 2 February to 2 March 2002 an IFAD Evaluation Team will visit Yemen to undertake an Interim Evaluation (IE) of the IFAD-supported Tihama Environment Protection Project (TEPP). The objectives of the Interim Evaluation will be:

(i) to assess the achievements of the project so far and their effects and impacts on the target groups 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 sustainable framework for natural resource management that can be replicated in other areas of the Tihama;
(iii) to assess future options for IFAD and the Government of the Republic of Yemen (GOY) cooperation in Tihama;
(iv) to derive lessons from this experience for the benefit of similar interventions.

IFAD Mission Composition

Name	**Date of Arrival**
Mr M. Rayner, Mission Leader and Economist Mr. N. Munro, Land Conservation and Sand Dune Expert Mr. H. Eisa, Farming System Specialist Mr. Godbole, Credit and Institution Specialist	9 February
Mr Andreas Gerrits, IFAD Associate Professional Officer and M&E Expert	time to be advised
Ms Maliha Hussein, Rural Sociologist/ Gender Specialist	Saturday 2 February Flight EK451 at 4:45 am
Ms Mona Bishay, IFAD Senior Evaluator (SE) and Mission Supervisor will join the mission during part of the field work and for the discussion of the Aide Memoire	Time and date of arrival to be advised

The mission will carry out its work on the basis of the background documentation available, corroborated and supplemented by an extensive field programme. Background documents comprise, *inter-alia*, the Staff Appraisal Report, the President's Report and Recommendations, Supervision Mission Reports (from UNOPS), the Project Implementation Reports, the MTR undertaken in February/March 2000 and the project's Final Report.

The mission will initially hold introductory talks in San'a and Hudaydah with the staff of the Ministry of Agriculture and Irrigation (MAI), the Tihama Development Authority (TDA), the Cooperative and Agricultural Credit bank (CACB), the Agricultural Research and Extension Authority (AREA) and other relevant organizations, to briefly discuss the framework of the evaluation and the specific issues of focus. The field evaluation methodology will be participatory throughout. As per previous agreement with the Chairmen of the TDA and CADB during the SE visit to Yemen, Yemeni

counterparts (at least one) will be assigned to each IFAD mission member and transportation and logistics to the project sites will be provided by TDA. Separate programmes will be agreed for each mission specialist, these will consist of visits to project sites to assess the main interventions and to hold focused group discussions with the beneficiaries.

The mission sociologist will precede the rest of the mission by about one week in order to undertake an initial survey of some of the beneficiaries in the project area and agree on her programme of field discussion sessions with the beneficiaries in a selection of villages in Wadi Siham, Zabid and others. It has also been agreed that counterpart staff from the project Women Support Component and TDA extension staff as deem fit will work closely with the mission sociologist and facilitate her field work. The objective will be to assess beneficiaries' reactions to project activities and to derive pointers of effectiveness and relevance.

At the end of the field visit a half a day workshop will be held in Hudaydah to discuss the provisional findings and conclusions of the mission and get reactions and validation from the main stakeholders. Upon return of the mission to Sana'a an aide memoire will be prepared and presented to the MOAWR and other implementing agencies indicating the main findings, conclusions and recommendations up to that point.

In fulfilling its objectives the mission will in particular undertake the following tasks:

Land Conservation

- Assess the cost efficiency of the technical model used for sand dune fixation, its impact on environmental protection and poverty in Tihama, as well as its sustainability and replicability given budgetary and other economic constraints at national and regional level.

- Review the effectiveness and timeliness of the monitoring system in analysing the dynamics of the sand dune movement and monitor them as a basis for the technical intervention, and determine what activities are required to ensure technical sustainability of the schemes.

- Investigate the role of research extension support in enhancing the direct economic benefits to be obtained from the stabilization of sand dunes through enhancing production of field crops and livestock. This will include an analysis of the factors underlying the apparent lack of effective engagement of the extension services in the project, and identification of constraints encountered and measures for rectification.

Water use efficiency

- Analyse the extent of farmers' adoption of water efficient irrigation methods including farmers incentives for adoption, their available means and constraints encountered and propose options for improvement if needed.

- Assess the relationship between TEPP/TDA and AREA and verify whether the role intended at design has materialized with respect to promotion of water use efficiency. This will include assessing achievements regarding the identification of field crops, forest trees and forages that are tolerant to drought and saline water and that optimize farmers return.

Socio-economic Issues

- Analyse poverty targeting during implementation and whether targeting criteria could be built into a project whose main objectives are described in terms of achieving environmental gains. This include investigation of who are the major beneficiaries of sand dune fixation and the extent to which these have, or are likely to contribute to the cost of building the schemes and their

operations and maintenance. This will also include studying the effectiveness of measures aimed at supporting the poorer groups (i.e. tenants, sharecroppers and women) and achieving poverty alleviation objectives.

- Assess whether participation was used in determining project sites and labour financial contribution and whether the recent attempt of forming associations for environmental protection and development along sand dunes sites is based on participation by the poor. The mission will also assess the economic and financial basis of these associations and their potential role in ensuring sustainability for the sand dune fixation.

- Evaluate the nature and extent of long term incremental employment generated on the larger farms in the project areas as a result of land protection.

- Assess the impacts (and lessons) of the programme of support for rural women in TEPP, providing water, fuelwood, health services and literacy, and establish whether these "social" interventions can be a precursor for economic benefits for rural women and empowerment for their social status and decision making capability.

Credit

- Assess achievements of the credit operations and the extent to which the target group has benefited from this component. This will include analysis of number of loans, credit allocation by type of activity, usage, average size of loans, recipients of loans in the two project sites, reasons for low repayment rates (e.g. collateral, cost of credit, etc.), impact of credit on poor rural women and households and means to increase rural access to financial services in Tihama.

- Analyse the sustainability of the credit operations given the present low recovery rate in the project area and the reported fairly high transaction costs of the Bank.

Management Development of TDA

- Assess the effectiveness of institutional support to the TDA and whether the TDA is now in a position to effectively replicate TEPP unaided (i.e. without technical assistance), as perceived in project design. Overall management efficiency in running the project will also be evaluated.

- Examine the effectiveness of the M&E system and the extent to which it has been able to direct project operations and act as a management tool.

The mission will also assess the overall impact of the TEPP so far on its beneficiaries (as well as its likely future impact), through, inter alia, participatory focused discussion groups in a selected sample of project villages.

On the basis of the above analysis the mission will provide conclusions as to the relevance, effectiveness, efficiency, impact of the project, partners performance, as well as clear recommendations highlighting options and rationale for IFAD/GOY future cooperation in the Tihama.

APPENDIX 2

PROJECT IMPLEMENTATION DATA

Table 1: Loan Disbursements – SDR '000

		Original	Revised	Disbursements													
No.	**Category Description**	**Allocation**	**Allocation**	**January 1996**		**March 1997**		**April 1998**		**October 1999**		**October 2000**		**October 2001**		**February 2002**	
				Total	**%**	**Total**	**%**	**Total**	**%**	**Total**	**%**	**Total**	**%**	**Total**	**%**	**Total**	**%**
1	Civil Works	1 200	1 460	0	0	80	5	108	7	945	65	1 265	87	1 556	107	1 680	115
2	Vehicles, Equipment and Materials	2 120	1 910	0	0	18	1	353	18	1 309	69	1 561	82	1 987	104	2 011	105
3	Technical Assistance and Training	1 800	1 950	0	0	76	4	123	6	1 117	57	1 556	80	2 080	107	2 114	108
4	Incremental Credit	250	750	0	0		0		0		0	298	40	598	80	598	80
5	Incremental Operating Costs	1 000	850	0	0	10	1	3	0	197	23	213	25	327	38	410	48
	(Excluding Salaries and Allowances)																
99	Unallocated	680	130														
99Z	Authorized Allocation - Special Account					416		416		416		714		331		181	
	TOTAL	**7 050**	**7 050**	**0**	**0**	**600**	**9**	**1 003**	**14**	**3 984**	**57**	**5 607**	**80**	**6 879**	**98**	**6 994**	**99**
	Balance Remaining			**7 050**	**100**	**6 450**	**91**	**6 047**	**86**	**3 066**	**43**	**1 443**	**20**	**171**	**2**	**56**	**1**

Note: % of disbursement columns refer to the revised allocation.

Table 2: Physical Progress – Some Key Indicators

Component	**Unit**	**Appraisal**	**January 1996**		**April 1997**		**May 1998**		**December 1999**		**October 2000**		**October 2001**	
		Target (a)	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
1. LAND CONSERVATION														
Mechanical Stabilization														
- Foredune earth works	km	35	0	0	0	0	0	0	0	0	0	0	0	0
- Fences *	km	360	0	0	0	0	n.a	n.a	96	27	275	76	394	109
Biological Stabilization														
- Tree planting *	ha	1 050	0	0	n.a	n.a	n.a	n.a	742	71	897	85	989	94
- Tree planting	km	70	0	0	3	4	n.a	n.a	49	70	63	90	63	89
Associated Infrastructure														
- Wells (b)	no.	14	0	0	5	36	n.a	n.a	28	200	32	229	45	321
- Burried PVC pipes main line	km	75	0	0	3	4	n.a	n.a	43	57	55	74	65	87
- Burried PVC pipes lateral lines	km	113	0	0	4	4	n.a	n.a	82	73	117	104	132	117

- Water tankers	no.	4	0	0	4	100	n.a	n.a	4	100	4	100	4	100
- Tractors/bulldozers	no.	2	0	0	0	0	n.a	n.a	2	100	2	100	2	100
- Access roads (c)	km	100	0	0	0	0	n.a	n.a	196	196	264	264	264	264
- Central nursery (rehab. and establish)	no.	4	0	0	0	0	n.a	n.a	4	100	4	100	4	100
- Central forest tree seed store *	no.	1	0	0	0	0	n.a	n.a	1	100	1	100	1	100
On Farm Shelterbelts														
- Irrigated area protected *	ha	4 800	0	0	0	0	n.a	n.a	2 012	42	3 330	69	3 800	79
- Rainfed area protected *	no.	9	0	0	0	0	n.a	n.a	3	33	3	33	5	56
- Agroforestry plots *	no.	100	0	0	0	0	n.a	n.a	55	55	91	91	167	167
- Settlement shelterbelt/community forests *	no.	15	0	0	0	0	n.a	n.a	5	33	7	47	8	53
Technical Assistance														
- Agroforester UNV (d) (e)	month	96	0	0	0	0	0	0	19	20	29	30	36	38
- Arid zone agroforester	month	15	0	0	0	0	0	0	19	127	29	193	36	240
- Other short-term consultants/TA	month	16	0	0	0	0	0	0	0	0	3	19	3	19
- Physical geographer UNV (d)	month	36	0	0	0	0	0	0	0	0	0	0	0	0
2. WATER CONSERVATION														
Technical Assistance														
- Irrigation agronomists UNV (d)	month	30	0	0	0	0	0	0	19	63	29	97	36	120
- Irrigation engineers	month	14	0	0	0	0	0	0	0	0	0	0	0	0
- Short-term consultants/TA	month	8	0	0	0	0	0	0	0	0	0	0	0	0
3. SUPPORT TO RURAL WOMEN														
Equipment														
- Mobile vet clinic	no.	1	0	0	0	0	n.a	n.a	0	0	1	100	1	100
- Manual grain mill	no.	47	0	0	0	0	n.a	n.a	0	0	0	0	0	0
- Manual feed chopper	no.	47	0	0	0	0	n.a	n.a	15	32	47	100	47	100
- Manual milk separator	no.	47	0	0	0	0	n.a	n.a	0	0	0	0	0	0
- Manual vegetable processor	no.	47	0	0	0	0	n.a	n.a	0	0	0	0	0	0
- Kerosene stove	no.	47	0	0	0	0	n.a	n.a	n.a.	n.a.	31	66	35	74
- Baby scales	no.	4	0	0	0	0	n.a	n.a	n.a.	n.a.	20	500	20	500
- First aid kit	no.	47	0	0	0	0	n.a	n.a	n.a.	n.a.	20	43	40	85
- Black board	no.	47	0	0	0	0	n.a	n.a	n.a.	n.a.	20	43	40	85
- Table	no.	47	0	0	0	0	n.a	n.a	n.a.	n.a.	20	43	42	89
Buildings														
- Animal shed	no.	47	0	0	0	0	n.a	n.a	20	43	24	51	24	51
- Fodder tree/shrub nursery	no.	2	0	0	0	0	n.a	n.a	n.a	n.a	n.a	n.a	2	100
Technical Assistance														
- Female doctor - national	month	24	0	0	0	0	n.a	n.a	5	21	15	60	23	94
- Home economist UNV (d)	month	36	0	0	0	0	n.a	n.a	12	33	22	61	30	83

- Nutrition specialist UNV (d)	month	24	0	0	0	0	n.a	n.a	0	0	0	0	0	0
- Female vet	month	36	0	0	0	0	n.a	n.a	20	56	30	83	36	100
Training														
- Midwife - 2 year course *	no.	22	0	0	0	0	n.a	n.a	n.a	n.a	22	100	22	100
- Animal health - 6 month course *	no.	12	0	0	0	0	n.a	n.a	n.a	n.a	12	100	12	100
- Other (literacy, nutrition etc.) *	month	447	n.a	n.a.	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	83	19
4. MANAGEMENT DEVELOPMENT OF TDA														
Buildings and Equipment														
- Training hall (large)	no.	1	0	0	0	0	0	0	0	0	0	0	1	100
- Traing hall (small)	no.	1	0	0	0	0	0	0	0	0	0	0	0	0
- Training accommodation	no.	1	0	0	0	0	0	0	0	0	0	0	0	0
- Minibus	no.	1	0	0	0	0	0	0	0	0	0	0	0	0
Technical Assistance														
- Chief technical adviser	month	50	0	0	0	0	11	22	40	80	50	100	50	100
- Training consultant	month	9	0	0	0	0	0	0	0	0	0	0	0	0
- Subject matter trainers	month	18	0	0	0	0	0	0	0	0	0	0	0	0
- Management adviser	month	6	0	0	0	0	0	0	0	0	0	0	0	0
- Financial adviser	month	4	0	0	0	0	0	0	0	0	0	0	0	0
Monitoring and Evaluation														
- Monitoring and Evaluation TA *	month	12	0	0	12	100	12	100	12	100	12	100	12	100
- Baseline survey	USD	50 000	0	0	16 150	32	16 150	32	16 150	32	16 150	32	16 150	32
- Impact study (mid-term)	USD	50 000	0	0	0	0	0	0	0	0	11 500	23	11 500	23
Training														
- English language training - 9 month course	no.	45	0	0	0	0	n.a	n.a	20	44	45	100	45	100
5. UNALLOCATED IN REPORTS														
Vehicles														
- 4 wd vehicles	no.	24	0	0	4	17	n.a	n.a	25	104	25	104	25	104
- Motorcycles	no.	4	0	0	0	0	n.a	n.a	18	450	18	450	18	450
Overseas Training * (f)	month	178	0	0	0	0	0	0	178	100	178	100	178	100

Source: Supervision reports, mid-term review report and TA reports.

(a) Targets * not included in the appraisal report but included in the supervision reports.
(b) 2001 Supervision Report gives 32 but this number excludes wells for drinking water and those outside the project area (8).
(c) Includes new and rehabilitated roads.
(d) UNVs were replaced with experienced TA.
(e) Replaced with a sand dune stabilization specialist.
(f) Includes TDA and CACB staff and study tours.

Table 3: Project Data

	Item	Unit	Total
1	**Project Area Villages and Population**		
	Villages	No.	47
	Households	No.	12 387
	Population	No.	81 215
2	**Sand Dune Stabilization (b)**		
a.	Area protected - 2002		
	- Wadi Siham	ha	525
	- Wadi Zabid	ha	400
	Total	ha	925
b.	Area protected - 2017		
	- Wadi Siham	ha	2 065
	- Wadi Zabid	ha	1 920
	Total	ha	3 985
3	**Water Conservation**		
a.	Loans		
	- Wadi Siham	No.	13
	- Wadi Zabid	No.	9
	- Outside project area	No.	12
	Total	No.	34
b.	Research Undertaken		
	- Agroforestry	No.	9
	- Water conservation	No.	3
	Total	No.	12
4	**Credit**		
a.	Number of loans		
	- Total	No.	1 073
	- Outside project area	No.	330
	- Project area	No.	743
b.	Disbursement - million		
	- Total	YER	171
	- Outside project area	YER	55
	- Project area	YER	116
c.	Loans and disbursement for women		
	- Loans	No.	100
	- %		9
	- Disbursements	YER	9
	- %		5
5	**Environmental protection and development associations**		
	Number of village associations	No.	7
	Average income per month	YER	3 000
	Average number of employees	No.	10
	Approximate average monthly expenditure - labour and fuel	YER	131 500
	Average savings	YER	92 400
6	**Project Beneficiaries (c)**		
a.	Sand dune stabilization (February 2002)		
	- Wadi Siham	hh	630
	- Wadi Zabid	hh	716
	Total	hh	1 346
b.	On-farm shelter belts	hh	1 340
c.	Health care - women and children	No.	3 500
d.	Literacy training	Women	1 300
e.	Animal health and production		
	Veterinary services	Families	4 428
	Animal husbandry and extension	hh	2 500
	Households keeping additional livestock or for the first time	No.	400
	Interest free livestock loans	Women	19
f.	Village extension workers	Women	25
g.	Domestic water		
	- Villages	No.	37
	- Households	No.	2 425

Source: Project Files

Notes: (a) Where available. (b) Excludes Hodeidah Green Belt. (c) Includes double counting as households and villages have benefited from more than one project activity.

Table 4: Date, Duration and Composition of Supervision and Mid-Term Review Missions

Type of Mission	Dates	Duration Days	Composition
Start-Up	January 1996	8	Mohamed Chaalala (SPMO), F. Abdelkader (Consultant) Abdallah Rahman (IFAD)
Supervision	April 1997	11	Mohamed Chaalala (SPMO), Dene Cuthbertson (Agronomist), Abdallah Rahman (IFAD)
Supervision	April/May 1998	9	Volker Zaddach (SPMO), Abdallah Rahman (IFAD)
Supervision	October 1998	14	Volker Zaddach (SPMO), Dene Cuthbertson (Agronomist)
Supervision	April 1999	12	Volker Zaddach (SPMO), Dene Cuthbertson (Agronomist)
Supervision	November 1999	7	Volker Zaddach (SPMO), Dene Cuthbertson (Agronomist)
Mid-Term Review	February/March 2000	23	Elsayed A. A. Zaki (Economist/Team Leader), Mohammed Zanul Abedin (Farming Systems)
Supervision	October 2000	8	Mohamed Chaalala (SPMO), Ms Dina Nabeel (Loan Administration Assistant)
Supervision	October/November 2001	13	Mohamed Chaalala (SPMO), Ms Dina Nabeel (Loan Administration Assistant)

Table 5: Rating of Project Performance by the Supervision Missions

Item	1997	1998 (1)	1998 (2)	1999 (1)	1999 (2)	2000	2001
Progress Indicators							
Compliance with Loan Covenants	3	2	2	1	2	2	2
Counterpart Funding Status	1	1	1	1	4	4	1
Compliance with procurement procedures	-	-	-	-	2	2	2
Procurement progress	1	3	2	1	1	1	2
Achievement of physical targets	2	2	2	1	1	2	2
Technical assistance performance	2	3	1	1	1	1	2
Performance of M&E system	1	2	2	2	1	3	4
Timeliness of reporting	-	-	-	-	-	2	3
Coherence between AWPB and implementation	2	2	2	2	1	2	2
Quality of audit	-	-	-	-	3	3	4
Quality of accounts	-	-	-	-	2	2	4
Project management performance	3	2	2	1	1	1	1
Impact Indicators							
Development impact	-	-	-	-	-	2	2
Expected benefits	2	2	2	2	2	2	2
Beneficiary participation	2	2	2	2	2	3	3
Institution building	2	2	2	2	2	1	1
Others							
Time overrun	-	-	-	-	-	2	3
Regular submission of AWPB	-	-	-	-	-	3	3
Acceptable disbursement rate	-	-	-	-	-	1	1

Notes: 1 = problem free; 2 = minor problems; 3 = major problems improving; 4 = major problems not improving

Table 6: Analysis of the Status of the Mid-term Review Recommendations (February 2002)

No.	Subject area and MTR para. no.	Implementation Status				Comments
		Yes	No.	Partial	n.a.	
1	**Management**					
	196		■			
	197		■			
	198		■			
	199			■		EPDAs do not know how they are to be involved.
	200		■			
2	**Training**					
	201		■			
	202			■		Study not completed due to lack of funds.
	203		■			
3	**Monitoring and evaluation**					
	204				■	Not a recommendation.
	205		■			
	206			■		Monitoring data not used for planning and management.
	207		■			M&E consultancy not hired.
4	**Sand dune stabilization**					
	208			■		
	209			■		
	210 (a) - (d)			■		
	210 (f) - (j)		■			
	211				■	Legal framework not required.
	212			■		Only present plantations studied.
	213		■			
	214		■			
	215	■				
	216		■			
5	**On-farm shelterbelts**					
	217				■	No need for plans as project only provides seedlings.
	218	■				
	219		■			
	220		■			The planting of Mesquite is banned.
	221		■			
	222			■		
	223		■			
	224		■			
	225		■			
	226		■			
6	**Water conservation**					
	227		■			Minimum research on water saving techniques undertaken.
	228		■			
	229		■			
	230			■		Manual only relates to plant breeding.
	231		■			Recommendation not considered sound.
	232		■			
	233		■			
	234		■			No project steering committee.
7	**Support for rural women**					
	235	■				
	236		■			
	237		■			
	238				■	
	232			■		Targeting approach not followed.
8	**Rural credit**					
	239	■				
	240			■		Collaboration good at field level.
	241			■		Loans not prioritized according to project objectives.
	242		■			Five revolving funds (i.e. one per branch) established.
	243 (a) - (c)		■			
	244	■				Implementation of the credit component is following the SLA.
TOTAL	**51**	**5**	**30**	**12**	**4**	
%		**10**	**59**	**24**	**8**	

n.a. = not applicable or no data available.

Table 7: Compliance with Loan Agreement Covenants/Conditions

Section	Covenant	Compliance Status/Date							
		1996	1997	1998	1999	1999	2000	2001	2002
1.02 (b)	"Project Area" means: two separate areas of the Tihama region located in the contact zone of the interwadi sands and the wadi flood plain, in Wadis, Siham and Zabid, as such area may be moodified form time to time by agreement between the Borrower and the Fund.	In compliance	In compliance	In compliance	In compliance	In compliance	In compliance	In compliance	In compliance
3.01 (b)	The Borrower shall cause TDA to make available to CACB those amounts of the proceeds of the loan required by CACB to carry out its responsibilities under the project in accordance with a SLA acceptable to the fund.	Not in compliance	Not in compliance	Not in compliance	Not in compliance	In compliance	In compliance	In compliance	In compliance
3.02	The Borrower shall, for the purpose of the project, open and maintain in its Central Bank a Special Account in USD, on terms and conditions satisfactory to the fund.	In compliance	In compliance	-	In compliance	In compliance	In compliance	In compliance	In compliance
3.04	Withdrawals from the Loan Account shall be made only on account of eligible expenditures relating to goods, works and services for the Project	-	-	-	In compliance	In compliance	-	-	In compliance
4.01	The Borrower shall carry out the project or cause the Project to be carried out in accordance with this Agreement and, in particular, schedule 4 thereto.	-	-	-	-	-	-	-	Not in compliance
4.02	The Borrower shall make available to TDA the funds required annually for the carrying out of the project in acccordance with paragraphs 6 to 7 of Schedule 4 of the project Loan Agreement.	In compliance	In compliance	-	-	-	Not in compliance	Not in compliance	In compliance
4.03 (a)	Procurement of goods, civil works and services to be financed from the Loan proceeds shall be carried out according to procedures laid down in Schedule 3 to this Agreement.	-	-	-	-	-	-	-	In compliance
4.03 (b)	In carrying out of the Project and maintenance and operation of the facilities completed under the Project, the Borrower shall cause TDA to employ qualified consultants and contractors, acceptable to the Borrower and the Fund, to an extent and upon terms and conditions satisfactory to the Fund.	-	-	-	-	-	-	-	In compliance
4.03 (c)	Consultant services to be financed from the proceeds of the Loan shall be engaged in accordance with procedures acceptable to the Fund. Everything being equal, preference shall be given to consultants from developing Member States of the Fund.	-	-	-	In compliance	In compliance	-	-	Not applicable
4.04	Without limiting the generality of Section 11.06 of the General Conditions, the Borrower shall make arrangements satisfactory to the Fund for the insurance of the goods, works and services to be financed from the proceeds of the Loan, to such an extent and against such risks and in such	-	-	-	In compliance	In compliance	-	-	In compliance

	amounts as shall be consistent with sound commercial practice.								
4.05 (a)	Section 11.08 (b) of the General Conditions, the financial records shall be prepared by TDA on an annual basis, ending 31 December of each year; and, notwithstanding the period of two months specified in Section 11.08 of the General Conditions, the detailed statements of the expenditure from the proceeds of the Loan during the period under review shall be submitted to the Fund no later than four months after the end of each such period.	Not in compliance	Not in compliance	Not in compliance	In compliance	In compliance	Not in compliance	Not in compliance	Not in compliance
4.05 (b)	Section 11.10 (a) of the General Conditions, the fiscal year for the auditing of the Project Accounts shall be from 1 January to 31December of each year.	-	-	-	-	-	-	-	In compliance
4.05 (c)	Section 11.10 (b) of the General Conditions: (i) notwithstanding the period of four months in the Section, the Borrower shall furnish the certified copies of the Audit Report to the Fund and the Cooperating Institution no later than six months after the end of the fiscal year; and (ii) in the event that the said audit of accounts shall not have been completed in sufficient time to permit the Audit Report to be submitted to the Fund and the Cooperating Institution in accordance with sub-paragraph (i) above, the Borrower shall engage or cause to be engaged independent auditors, acceptable to the Fund and to the Cooperating Institution no later than three months after the period specified in sub-paragraph (i) above. The cost of such audit shall be financed from the Loan Account.	Not applicable	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance
4.07	For the pupose of the implementation of the Project, the Borrower shall cause TDA and CACB to conduct its business in accordance with sound administrative, financial and agricultural practices under the supervision of comptetent and experienced management personnel.	-	-	-	-	-	-	-	In compliance
4.08	Except as the Borrower and the Fund shall otherwise agree, the Borrower shall ensure that TDA and CACB shall not sell, lease or otherwise dispose of any of its assets which shall be required by TDA and CACB for the efficient carrying out of its operation or the disposal of which may projudice the ability of TDA and CACB sufficiently to perform any of its obligations relating to the Project.	-	-	-	-	-	-	-	In compliance
4.09	The Borrower shall take all reasonable measures to ensure that the execution and operation of the Project are carried out with due regard to environmental factors, including the maintenance of appropriate agricultural pesticide practices. To that end, the Borrower and the Fund shall agree on a positive list of environmentally safe pesticides to be procured under the Project no later than six months after the Effectiveness Date.	-	-	-	Not in compliance	Not in compliance	-	-	Not in compliance

5.01	During the execution of the Project, the Borrower and the Fund shall periodically review the interest rates to be applied to the credits to be made out of the proceeds of the Loan. These reviews shall be conducted jointly with the objective of reaching positive interest rates over time so that the Borrower may take appropriate meaures, if necessary, consistent with the policies of the Borrower and the Fund, to achieve that objective.	-	-	-	Not in compliance	Not in compliance	-	-	Not in compliance
6.01 (a)	The Borrower, in consultation with the Cooperating Institution, shall establish arrangements satisfactory to the Fund and the Cooperating Institution for monitoring the progress of the execution of the project and for an ongoing evaluation of the effects of the Project and the impact of its various components on the Project beneficiaries.	Not applicable	Not in compliance	In compliance	In compliance	In compliance	Not in compliance	Not in compliance	Not in compliance
6.01 (b)	Except as the Fund shall otherwise agree, the Borrower shall submit its proposal regarding arrangements and the terms of reference for M&E referred to in paragraph (a) hereof to the Fund and the Cooperating Institution no later than six months from the date of this Agreement, including information relating to: (i) organization, staffing, location and status of the entity that shall be responsible for M&E on behalf of the Borrower; (ii) the work programme and proposed budget allocation by the Borrower for M&E; (iii) the schedule of reporting by the Borrower to the Fund and the cooperating Institution; and (iv) any other matters which the Fund and the Cooperating Institution may request.	Not applicable	-	-	-	-	-	-	Not in compliance
6.01 (c)	The Borrower shall finalize M&E arrangements referred to in this section in accordance with the recommendations, if any, of the Fund on its proposal and shall implement them in consultation with the Cooperating Institution.	Not applicable	-	-	-	-	-	-	Not in compliance
6.02	For Project completion evaluation, The Fund, either independently or in collaboration with the Cooperating Institution, may may appoint, in consultation with the Borrower, consultants or an agency of its choice to evaluate, on the basis of relevant key indicators, the imapct of the completed portions of and the whole of the Project on the beneficiaries of the Project.	-	-	-	-	-	-	-	Not applicable
6.03	Except as the Fund shall otherwise agree, in carrying out its obligations under this Article, the Borrower shall take into account the Fund's Guiding Principles for the Design and Use of M&E in Rural Development Projects and Programmes, as it may be amended from time to time by the Fund.	-	-	-	-	-	-	-	Not in compliance
6.04	The Borrower shall ensure that all necessary data and other relevant information from the Project executing agency and other entities concerned with the implementation of the Project and maintenance and operation of the facilities completed thereunder are made available promptly to the	-	-	-	-	-	-	-	Not in compliance

	consultants/agnecy entrusted with carrying out of any task under this Article.								
Sch. 2 Para. 2	Withdrawals from Loan Account for payments made under contracts costing less than USD 20 000 equivalent, expenditures for civil works by force account, local training, incremental operating costs and sub-loans disbursed by CACB shall be made against certified statements of expenditure, relevant documents for which need not be submitted to the Fund, but shall be retained by the Borrower for periodic inspection by the representatives of the Fund and the Cooperating Institution, in accordance with sectiuon 11.09 of the General Conditions.	-	-	-	-	-	-	-	In compliance
Sch. 2 Para. 3	Nothwithstanding the provisions of paragraph (b) of Section 6.01 of the General Conditions, no withdrawals shall be made in respect of payments made under Category IV of the table set forth in paragraph 1 of this Schedule until the SLA referred to in Section 3.01 (b) (ii) of this Agreement, satisfactory to the Fund, shall have been duly signed.	-	-	-	-	-	-	-	In compliance
Sch. 3 Para. 2	Procurement of goods and civil works contracts to be financed from the proceeds of the Loan shall be subject to the provisions of the Guidelines for Procurement under Financial Assistance from the International Fund for Agricultural Development of 1982 (hereinafter called the Procurement Guidelines), as they may be amended from time to time by the Fund. If any provision of the Procurement Guidelines is inconsistent with a provision of this schedule, then the latter sall govern.	-	-	-	-	In compliance	-	-	In compliance
Sch. 3 Para. 3	To the extent possible, the goods and civil works shall be bulked into sizeable bid packages in such a manner as to permit the optimal use competitive bidding. Before commencement of procurement, the Borrower shall furnish to the Fund, for approval, a list of goods to be procured, the proposed grouping of these goods and the proposed number and scope of civil works contracts to be awarded.	-	-	-	-	-	-	-	Not applicable
Sch. 3 Para. 4	Each contract for the supply of vehicles, equipment and materials, estimated to cosst USD 100 000 equivalent or more shall be awarded through limited international bidding procedures on the basis of an evaluation and comparison of bids invited from a list of at least three qulaified suppliers from different Member Countries of the Fund. Procurement under this paragraph shall be carried out in accordance with the procedures set forth in paragraphs 1, 2 and 3 of the Procurement Guidelines, excluding sub-paragraphs 1.3, 1.4, 3.7 and 3.9 thereof.	-	-	-	-	-	-	-	Not applicable

Sch. 3 Para. 5	Each contract for the supply of vehicles, equipment and materials, estimated to cost less than USD 100 000 shall be awarded on the basis of competeitive bidding advertised locally, in accordance with procedures satisfactory to the Fund; however, procurement estimated to cost less than USD 10 000 shall be carried out in accordance with local shopping procedures satisfactory to the Fund.	-	-	-	-	-	-	-	Not in compliance
Sch. 3 Para. 6	Civil Works may be awarded on the basis of competitive bidding advertised locally in accordance with procedures satisfactory to the Fund or may be carried out by the Borrower through force account.	-	-	-	-	-	-	-	In compliance
Sch. 3 Para. 7	The award of any contract estimated to cost USD 1000 000 or more shall be subject to prior review in accordance with the provisions of Annex 3 to the Procurement Guidelines.	-	-	-	In compliance	In compliance	-	-	In compliance
Sch. 3 Para. 8	With respect to each contract not governed by the preceeding paragraph, the Borrower shall furnish certified or conformed copies of such contract, one to the Fund and two to the Cooperating Institution, together with the analysis and of the respective bids and the recommendations for award promptly after its execution and prior to the submission to the Fund of the first application for withdrawal of funds from the Loan Account in respect of such contract.	-	-	-	-	-	-	-	Not applicable
Sch. 3. Para. 10	In respect of contracts referred to in para. 8 above, before agreeing to any material modification or waiver of the terms and conditions of a contract, or granting an extension of the stipulated time for performance of such contract, or issuing any change order under sch contract (except in cases of extreme urgency) which would increase the cost of the contract by more than 10% of the original price, the Borrower shall inform the Fund of the proposed modification, waiver, extension or change order and the reason therefor. The Fund, if it determines that the proposal would be inconsistent with the provisions of this Agreement, shall promptly inform the Borrower and state the reasons for its determination.	-	-	-	-	-	-	-	Not applicable
Sch. 4. Para. 2	MAWR shall have overall responsibility for the Project at the national level	-	-	-	In compliance	In compliance	-	-	In compliance
Sch. 4. Para. 3	TDA shall be responsible for implementing the Project, except for Parts B (iii) and C (iv) of the Project which shall be executed by CACB. This responsibility of TDA shall rest with the Chairman of the Board of Directors, who shall be assisted in day-to-day management by the Director General. TDA shall implement the Project through its existing structure by assigning the Project components and activities to its Directorates and Divisions according to their respective functions. Activities within the Project Area shall be supervised by TDA's Sub-regional Directors.	-	-	-	In compliance	In compliance	-	-	In compliance

Sch. 4. Para. 4	TDA shall appoint a full-time Project Manager. He shall be responsible, through TDA's Director General, to TDA Chairman for ensuring that Project Objectives are expressed in coordinated annual work plans and that management units in TDA completed their tasks. TDA shall establish a Project Operations Committee, consisting of TDA's Director General as chairperson, and TDA's Deputy Director Generals, Heads of Divisions at TDA HQ, the Sub-regional Directors and two representatives each from one cooperative in each of the two wadis in the Project Area. The Project Manager shall be the Secretary of the Committee. This Committee shall meet monthly to review progress and resolve implementation difficulties.	Not in compliance	In compliance	In compliance	-	-	In compliance	In compliance	In compliance
Sch. 4. Para. 5	TDA shall appoint a Project Liaison Officer, based in Sana'a, whose duties shall be primarily to represent TDA at national level, to facilitate the actions required from other national agencies and to assist in procurement and financial management.	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance
Sch. 4. Para. 6	The Borrower shall submit to the Fund and the Cooperating Institution, for their review and comments, the draft Annual Work Programme and Budget, based on the work programmes and budgets prepared by each of the implementing agencies for the Project, not later than three months before the commencement of each fiscal year of the Borrower. The Borrower shall consider the comments of the Fund and the cooperating Institution on the said Annual Work Programme and Budget prior to its finalization.	In compliance	In compliance	In compliance	In compliance	In compliance	In compliance	In compliance	In compliance
Sch. 4. Para. 7	The Borrower shall include in its national budget the counterpart funds determined for the execution of the Project in accordance with the Annual Work Programme and Budget referred to in para. 6 above.	Not applicable	-	-	In compliance	In compliance	-	-	In compliance
Sch. 4. Para. 8	The Borrower shall submit to the Fund, for its comments, six-monthly progress reports on the execution of the Project.	Not applicable	In compliance	In compliance	-	In compliance	In compliance	In compliance	In compliance
Sch. 4. Para. 9	(a) Except as the Fund shall otherwise agree, a Mid-Term Review (MTR) of the project shall be carried out jointly by the Borrower and the Fund, with the assistance of the Cooperating Institution, no later than the end of the thrid year or the beginning of the fourth year of the implementation of the Project. The MTR shall be sued to evaluate the achievement of the objectives of the Project and its constraints, as well as such design reorientation as may be required to achieve the said objectives and remove the said constraints. (b) The terms of reference of the MTR shall be prepared by the Fund and the Cooperating Institution and shall *inter alia*, include the detailed expertise required and tasks to be carried out during the MTR. (c) The findings of the MTR shall be communicated promptly by the Fund to the Borrower for discussion jointly with the Fund, and the	-	-	-	In compliance	In compliance	-	-	Not applicable

	Cooperating Institution. The Borrower shall ensure that the recommendations of the Fund resulting from the MTR shall be implemented within a reasonabl								
Sch. 4. Para. 10	The Borrower shall report to the Fund on progress made with regard to legislation on water laws and regulations, to ensure the conservation of groundwater in the Project Area and a continuing long-term policy dialogue on the issue.	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance
Sch. 4. Para. 11	For the efficient implementation of the Project, the Borrower shall ensure that vehicles and equipment and funds for their operation and maintenance are allocated to, and under the control of, the divisions, sections and officers for whole work they are required.	-	-	-	-	-	-	-	Not in compliance
Sch. 4. Para. 12	TDA and CACB shall engage the staff required for the carrying out of the Project on a timely basis.	-	-	-	-	-	-	-	In compliance
Sch. 4. Para. 13	TDA shall give priority for employment in Project activities requiring part-time labour to members of the target groups of the Project in a manner satisfactory to the Fund.	-	-	-	-	-	-	-	In compliance
Sch. 4. Para. 14	TDA and AREA shall sign a Memorandum Agreement, satisfactory to the Fund, not later than six months after the Effectiveness Date which shall include a planned programme of adaptive research to be undertaken by AREA, which would meet Project Objectives on behalf of and in association with TDA.	Not applicable	Not in compliance	Not in compliance	In compliance	In compliance	Not in compliance	Not in compliance	Not in compliance
Sch. 4. Para. 15	Not later than six months after the Effectiveness Date, the Borrower shall charge TDA with the responsibility of implementing literacy and health and nutrition campaigns in the Project Area on behalf of the Ministries of Education and Public Health, respectively.	Not applicable	Not in compliance	Not in compliance	In compliance	In compliance	In compliance	In compliance	In compliance
Sch. 4. Para. 16	Not later than six months after the Effectiveness Date, TDA and the National Cooperatives Union or, if the Fund so agrees, the Local Development Councils shall sign a Subsidiary Agreement, satisfactory to the Fund, in the execution of the Project in which, *inter alia*, shall be indicated in detail the role of the cooperatives in the execution of the Project and relationships between them and Project beneficiaries.	Not applicable	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance	Not in compliance
Sch. 4. Para. 17	In accordance with Section 6.11 of the General Conditions, all the goods and services and other items for the Project shall be exempted from all taxes including customs duties and other taxes affecting materials, equipment and services to be used by the civil contratctors and income taxes and other duties affecting fees, salaries and other benefits of the consultants and experts referring to Category III of Schedule 2 to this Agreement.	In compliance	In compliance	Not in compliance	-	-	In compliance	In compliance	In compliance

Sch. 4. Para. 18	In order to safeguard capital cost and investment made under the Project, the Borrower shall provide, after the implementation of the Project, sufficient funds from its national budget for operations and maintenance of the implemented Project.	-	-	-	-	-	-	-	Not applicable
Sch. 5. Para. 2	Except as the Fund, in consultation with the Cooperating Institution, shall otherwise agree, payments out of the Special Account shall be made exclusively for eligible expenditures in accordance with the provisions of this schedule.	-	-	-	-	-	-	-	In compliance
Art. VI, Section 6.06 Gen. Cond's	The Borrower shall submit to IFAD and the Cooperating Institution an official letter designating authorized persons to sign Withdrawal Applications together with authenticated specimen signatures.	Not in compliance	In compliance	-	-	-	In compliance	In compliance	In compliance
Letter to the Borrower Att. 2D - Special Account 2 -(a) & (b)	Authorized Allocation Withdrawal Application should be accompanied with: (a) A copy of the agreement between the Borrower/the Implementing/Executing Agency and the Central Bank, confirming the establishment of the Special Account, providing the Account No. and the agreed procedures for the operation of the account. (b) List of persons (names and functions) authorized to operate the Special Account.	Not in compliance	In compliance	In compliance	-	-	In compliance	In compliance	In compliance

Summary								
In compliance	5	9	6	15	18	10	10	29
Not in compliance	7	9	9	7	6	8	8	16
Not applicable	9	0	0	0	0	0	0	8
Not monitored	32	35	38	31	29	35	35	0
Total	**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**

APPENDIX 3: GUIDING FRAMEWORK FOR IMPACT EVALUATION

MAIN DOMAINS OF IMPACT	Key Questions for Impact Assessment in Rural Communities Affected by the Project (changes to which the project has contributed	Assessment of change (1)			Reach of change (3)		Assessment of Project Contribu-tion (2)	Dynamic Processes Triggered by the Project** (4)	Sustain-ability Potential *** (5)
		Presence and Direct. of change (+) (0) (-)	What has changed (Indicators)	Extent of Change (Rating) * 4/3/2/1	How many (house-holds and people)	Who (Poor/ poorest/ better of)	4/3/2/1	4/3/2/1	4/3/2/1
I. Physical and financial assets	1.1 Did farm households physical assets change (i.e. farmland, water, livestock, trees, equipment, etc.)?	+	Increase in farm area as a result of reduction in sand dune encroachment Improvements in irrigation conveyance systems through use of PVC pipes On-farm shelter belts Sand dune stabilization belts Homestead tree plantings Increase in livestock numbers	2	1500 67 1,340	All	2	1	1
	1.2 Did other household assets change (houses, bicycles, radios other durables, etc.)	+	Houses	1	NA	NA	1	1	NA
	1.3 Did infrastructure and people access to markets change? (transport, roads, storage, communication facilities, etc.)	+	Roads	2	500	All	3	2	2
	1.4 Did households' financial assets change? (savings and debts)	0							
	1.5 Did rural people access to financial services change? (credit, saving, insurances, etc.)	+	Access to credit	3	1,073	poor	3	2	1
	1.6 Did the extent of security in access to assets change?	0							
	1.7 Other change in physical & financial assets of rural people?	0							
II. Human assets	2.1 Did children nutritional status change?	0							
	2.2 Did people access to potable water change?	+	Water	2	2,425	All	3	3	2
	2.3 Did access to basic health and disease prevention services change?	+	Access to health facilities	2	3,500	All	2	2	1
	2.4 Did the incidence of HIV infection change?	NA							
	2.5 Did maternal mortality change?	+	Access to midwives	1	1	Poor	1	1	1
	2.6 Did access to primary education change?	+	Schools	1	1	Poor			
	2.7 Did primary school enrolment for girls change?	+	Schools	1	1	Poor			
	2.8 Did women and children workload change?	+	Access to domestic water	2	2	Poor	2	2	2

	2.9 Did adult literacy rate and/or access to information and knowledge change?	+	Female literacy	2	1,300	All	3	3	3
	2.10 Did people professional skills change?	+	Availability of Mid wives	2	50	All	3	3	1
	2.11 Other changes in human assets?	0							
III. Social capital and people empower-ment	3.1 Did rural people organisations and institutions change?	+	EPDA	1	1	All	2	2	2
	3.2 Did social cohesion and local self–help capacity of rural communities change?	+	Water Provision of primary education	2 1	2 1	All All	2 1	3 1	3 3
	3.3 Did gender equity and/or womens' conditions change?	0							
	3.4 Did rural people feel empowered vis a vis local and national public authorities and development partners? (Do they play more effective role in decision making?)	0							
	3.5 Did rural producers feel empowered vis a vis the market place? Are they in better control of inputs supply and marketing of their products?	0							
	3.6 Did migration out of the area change?	0							
	3.7 Did access to information and knowledge change?	0							
	3.8 Other changes in social capital (e.g. more equitable access to assets in general)	0							
IV. Food Security (Production, Income and Consump-tion)	4.1 Did farming technology and practices change?	+	Irrigation technology Animal health care	2	67 2,500	All	1	1	3
	4.2 Did agricultural production change (area, yield, production mix, etc.)?	+	Area, yields and production	2		All	1	2	3
	4.3 Did non-farm activities/employment/income opportunities change?	+	Employment	2	182,000 man-days	All	3	1	1
	4.4 Did household real income and/or consumption level and pattern change?	+	Food consumption	1	1000 to 2000	All	3	NA	1
	4.5 Did the frequency of food shortage change?	0							
	4.6 Did household food security change?	0							
V. Environment & common resource base	5.1 Did the natural resource base status change (land, water, forest, pasture, fish stocks…)?	+ -	On farm shelter belts Sand dune stabilization belts Water quality and quantity	2 (3)	1,340 1,500 700	All All	3 (1)	1 1	2 NA
	5.2 Did the environment change?	+	Less sand and wind and more shade	2	2,000	All	3	1	2
	5.3 Other change in the environment?	0							
VI. Institutions, policies, and regulatory framework	6.1 Did rural financial institutions change?	0							
	6.2 Did local public institutions and service provision change?	+	TDA Management Capacity	2	NA	NA	2	2	2
	6.3 Did national/sectoral policies affecting the rural poor change?	+	Social Fund	1	1	Poor	NA	NA	NA
	6.4 Did the regulatory framework affecting the rural poor change?	0							
	6.5 Other change in institutions and policies?	+	Interest rates	1	2	All	1	NA	NA

MAIN DOMAINS OF IMPACT	Key Questions for Impact Assessment in Rural Communities Affected by the Project (changes to which the project has contributed	Expectation/ (Project stated objectives) (6)				Effectiveness Rating (achievement against stated objectives) 4/3/2/1 (7)				Innov. Approa-ches in achieving impact 4/3/2/1 (8)	Replica bility Poten-tial 4/3/2/1 (9)	Repli-cation 4/3/2/1 (10)
		Change what?	Change how much?	Reach how many?	Reach who?	Change what?	Change how much?	Reach how many?	Reach who?			
I. Physical and financial assets	1.1 Did farm households physical assets change (i.e. farmland, water, livestock, trees, equipment, etc.)?	Sand dune encroachment	4,225 Ha	7,000	House-holds	2	815 Ha	1,500	4	1	2	2
		Livestock production	15%	600	Rural women	4	2	2	3			
		Fodder quantity & quality	50%	1,200	Rural families	2	2	2	4			
		Fruit trees	100% or 0.4 ha	2,327	Farms	2	2	2	4			
	1.2 Did other household assets change (houses, bicycles, radios other durables, etc.)											
	1.3 Did infrastructure and people access to markets change? (transport, roads, storage, communication facilities, etc.)	Facilitating access to the sand dune stabilization belts	12 Km construc tion and rehabilit ation	NA	NA	4	4	NA	NA			
	1.4 Did households' financial assets change? (savings and debts)											
	1.5 Did rural people access to financial services change? (credit, saving, insurances, etc.)	Access to credit	USD 1.05 million		Farmers and village women	2	4	3	3			
	1.6 Did the extent of security in access to assets change?											
	1.7 Other change in physical & financial assets of rural people?											
II. Human Assets	2.1 Did children nutritional status change?	Knowledge about nutrition	NQ	7,000	Women	1	1	1	1	2	3	1
	2.2 Did people access to potable water change?	Domestic water supply		30 4,700	Villages women	4		4	4			

	2.3 Did access to basic health and disease prevention services change?	Health education and nutrition education		900	Families	2		2	4			
	2.4 Did the incidence of HIV infection change?											
	2.5 Did maternal mortality change?											
	2.6 Did access to primary education change?											
	2.7 Did primary school enrolment for girls change?											
	2.8 Did women and children workload change?	Women and girls workload	8 hrs per week	4,700	Women and girls	4	4	2	4			
	2.9 Did adult literacy rate and/or access to information and knowledge change?	Female literacy	Reading and writing skills	1,000	Young women	4	3	4	4			
	2.10 Did people professional skills change?											
	2.11 Other changes in human assets?											
III. Social capital and people empower-ment	3.1 Did rural people organisations and institutions change?											
	3.2 Did social cohesion and local self–help capacity of rural communities change?	Collaboration with the NCU and project beneficiaries	NQ	NQ	NQ							
	3.3 Did gender equity and/or womens' conditions change?											
	3.4 Did rural people feel empowered vis a vis local and national public authorities and development partners? (Do they play more effective role in decision making?)											
	3.5 Did rural producers feel empowered vis a vis the market place? Are they in better control of inputs supply and marketing of their products?											
	3.6 Did migration out of the area change?											
	3.7 Did access to information and knowledge change?											
	3.8 Other changes in social capital (e.g. more equitable access to assets in general)											
IV. Food security (Production, Income and Consump-tion)	4.1 Did farming technology and practices change?	Water conservation techniques	15% water 50% time	2,327	Farms	1	1	1	4	1	3	3
		Land levelling activities	15% water 25% time	2,327	Farms	1	1	1	4			
		Livestock production	15%	5,600	Women	2	2	2	3			

	4.2 Did agricultural production change (area, yield, production mix, etc.)?											
	4.3 Did non-farm activities/employment/income opportunities change?											
	4.4 Did household real income and/or consumption level and pattern change?											
	4.5 Did the frequency of food shortage change?											
	4.6 Did household food security change?											
V. Environment and common resource base	5.1 Did the natural resource base status change (land, water, forest, pasture, fish stocks…)?	Land conservation Water conservation		7,000 2,327	House-holds farms					3	3	1
	5.2 Did the environment change?	3										
	5.3 Other change in the environment?											
VI. Institutions, policies, and regulatory framework	6.1 Did rural financial institutions change?									1	1	1
	6.2 Did local public institutions and service provision change?		NQ	TDB	TDA staff	2	2	TBD	TBD			
	6.3 Did national/sectoral policies affecting the rural poor change?	3										
	6.4 Did the regulatory framework affecting the rural poor change?	2										
	6.5 Other change in institutions and policies?											

APPENDIX 4

LIST OF PERSONS MET

Central Government Officials

Ahmed Salem Al-Jabali	Minister of Agriculture & Irrigation
Farid A. Mogawar	Deputy Minister, Ministry of Agriculture and Irrigation
Dr. Mutahar A. Al-Abbasi	Deputy Minister for Macro – Planning and Studies
Anwar Al-Harazi	Deputy Minister for Project Planning and Pogramming
Abdulmalik Al-Thawr	General Director for Planing & Monitor/ Ministry of Agriculture and Irrigation
Ahmed Sabar	M&E, Ministry of Agriculture and Irrigation

Government of Hodeidah

Hassan Ali Haig	Governor of Hodeidah

Ministry of Social Security

Mohammad Abdullah Hajar	Director
Yahya Haider	Head of Co/operative Associations

TDA Hodeidah

Dr. Mohammed Yahia Al-Gashm	Chairman TDA
Dr. Sakkaf A. Al-Sakkaf	Director General TDA
Zain Hadi Haig	Project Director TEPP
Managi Hagar	Deputy Project Director
Hussein Hassan Duma	Director Central Region/TDA Bajel
Mohammed F.O. Yammal	M&E TEPP
Abdul Monem Bader	Economist
Mohammed Ahmed Nagi	Head of Land and Water Conservation Project (World Bank)
Saddik A. Makboli	Animal Production Specialist/Communication and Participation TDA
Adnan Abdulrahman Saleh	Forester
Mohammad Saroor	Financial Controller/TEPP
Ms Eman Hossain Rassen	Soil and Irrigation Engineer/TEPP
Ms Entesar Salim Al-Mussali	Agriculture Engineer
Dr. Sana As Shari	TEPP
Khalid Sheikh	Hydrology Department
Mohammed Abdulrahman	Hydrology Department
Nawaf Salim	Hydrology Department
Osman Ali Swaileh	Hydrology Department

TDA-TEPP Wadi Siham

Sultan Mohammed Kasim	General Supervisor Central Area
Ms Halima Mohammad Salim	Extension Agent/Women's Development Unit
Ms Hajura Ahmed Salam	Extension Agent/Women's Development Unit
Ms Aliya Mohammad Baji	Extension Agent/Women's Development Unit

Ms Faiza Ahmed Abbass	Extension Agent/Women's Development Unit
Ms Saghira Shareem	Extension Agent/Women's Development Unit
Ms Najla Bareta	Extension Agent/Women's Development Unit
Ms Tayyaba Habani	Extension Agent/Women's Development Unit
Ms Syeda Mohammad Hajam	Extension Agent/Women's Development Unit
Ms Ayesha Yahya Mohammad	Extension Agent/Women's Development Unit
Ms Salam Mohammad	Extension Agent/Women's Development Unit
Ms Mariam Mohammad Salim	Extension Agent/Women's Development Unit
Ms Shoaiya Jabbar	Extension Agent/Women's Development Unit
Ms Ibtisam Salim Fazi	Extension Agent/Women's Development Unit
Ms Raj Ahmed Hussain	Extension Agent/Women's Development Unit
Ms Sadia Mohammad Musa	Extension Agent/Women's Development Unit
Ms Salwa Shireen	Extension Agent/Women's Development Unit

TDA-TEPP Wadi Zabid

Abdul Wali Hader	TDA Manager South Region
Abdul Aziz Abdal-Galil	Coordinator South Region / TEPP
Abdulaziz Abdul Al Jaleel	Sand Dune Stabilization Coordinator
Nageeb Mohammed Ali	Head of Agricultural Extension + Training
Abdul Paqi Al-Hadad	Deputy Head of Agricultural Extension + Training/Rural Development Supervisor
Abdul Razak Al-Hamely	M&E / TDA-TEPP
Ms Shukriya Ahmed	Extension Agent/Women's Development Unit
Ms Iqbal Omer	Extension Agent/Women's Development Unit
Ms Khadija Mohammad Nuriya	Extension Agent/Women's Development Unit
Ms Adila Ali Wuro	Extension Agent/Women's Development Unit
Ms Fatima Awel Khadil	Extension Agent/Women's Development Unit
Ms Sadu Umer Misghazi	Extension Agent/Women's Development Unit
Ms Fatima Mohammad Kela	Extension Agent/Women's Development Unit
Ms Fatum Ali Nasir	Extension Agent/Women's Development Unit
Ms Nabila Masood	Extension Agent/Women's Development Unit
Ms Salama Abbass	Extension Agent/Women's Development Unit
Ms Isma Asharfi	Extension Agent/Women's Development Unit
Ms Nayma Ahmed Sheikh	Extension Agent/Women's Development Unit
Ms Rukaya Mohammad Dana	Extension Agent/Women's Development Unit
Ms Bilquis Hassan	Extension Agent/Women's Development Unit
Ms Iman Mohammad Hamana	Extension Agent/Women's Development Unit
Ms Hamadiya Ahmed	Extension Agent/Women's Development Unit
Ms Syeda Ibrahim	Extension Agent/Women's Development Unit
Ms Faiza Yahya	Extension Agent/Women's Development Unit
Ms Afaf Tehmeen	Extension Agent/Women's Development Unit
Ms Nabila Ali Nasir	Extension Agent/Women's Development Unit

Local Government Representatives

Ali Hambush	Director, Head of Service Committee/El Maina
Yusuf Yahya Ali Imbari	Deputy Director/Local Council
Abdul Gabbar Hamood Al-Sharif	Director Local Council Al Tahyata/Wadi Zabid

Co-operative Organizations

Ali Yousuf	Head of Agriculture Co-operative Union/Hodeidah

CACB staff

Mohamed H. al-Wadan, PhD	Chairman
Yahya Al-Sabri	General Manager/Sana'a
Mohamed Othman Al-Agbari	Director of Planning & Foreign Loans/Sana'a
Qoussim A. Ali	Deputy Director, Foreign Loans Departement/Sana'a
Abdul Wahid Saif Al-Khorashi	Foreign Loans Departement/Sana'a
Mohammed A. Faki	Regional Director/Hodeidah
Abdel alim Numan	Deputy Regional Director/Hodeidah
Hatim Ahmed Tamer	Director/Hodeidah
Abdul Muhammad Al-Jabali	Deputy Director/Hodeidah
Aiman Abdu Mohammed Al-Gabady	Head, Credit Departement/Hodeidah
Akran Abdul Hai	Credit Officer/Hodeidah
Abdullah Muharan	Director/Bajel
Abdul Rehman Ali Saleh	Deputy Director/Bajel
Abdul Aziz Abdullah Attiya	Director/Zabid
Mustafa Alim Mohammed	Credit Officer/Zabid
Faud Abdullah Nasser	Director/Beit-el-Faki
Mr Akram	Credit Officer/Wadi Siham

AREA

Dr. Ismail A. Muharram	Chairman AREA
Dr. Abdul Wahid-Mukrid	Vice-Chairman AREA
Dr. Mohammed Al-Musairy	Director of Research
Dr. Khalil Al-Shargaby	Director of Extension + Education
Abdullah Al-Kibsi	Director Surdud Research Station
Ahmed E. Osman	Pasture Forage + Range Ecologist / ICARDA

UN

Abdellatif Tabet	FAO Representative/Sana'a
Ms. Naima A. Hassan, PhD	Environmental & Development Expert, FAO/Sana'a
Abdo Seif UNDP/Sana'a	Team Leader, Sustainable Livelihoods,

The World Bank

Gianni Brizzi	Resident Representative, Sana'a
Naji Abu-Hatim	Senior Operations Officer, Sana'a
Mohamed Al-Sabbry	Economic Analyst, Sana'a

Non-Government Organizations

Faisal Abdul Aziz	Charitable Society for Social Welfare/Hodeidah
Ms Zabida Ahmed Araishi	President of Yemen Women's Association
Ms Huda Al Maljami	Yemen Women's Union/Hodeidah
Ms Afra Al Maljami	Yemen Women's Union/Hodeidah
Ms Intesar Shakir	Yemen Association for Poverty Alleviation/Hodeidah