IFAD

Enabling poor rural people
to overcome poverty

Republic of Yemen

Rural Growth Programme

Detailed design report

Main report and appendices

Document Date: 20-Aug 2013
Project No. 1672

Near East, North Africa and Europe Division
Programme Management Department

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Currency equivalents

Monetary Unit	=	Local currency
1 USD	=	YER 214
1 YER	=	US $ 0.00464

Weights and measures

1 kilogram (kg)	=	2.204 pounds
1 000 kg	=	1 metric ton (t)
1 kilometre (km)	=	0.62 miles
1 meter (m)	=	1.09 yards
1 square meter (m2)	=	10.76 square feet
1 acre (ac)	=	0.405 hectares (ha)
1 hectare (ha)	=	2.47 acres
1 gallon (gl)	=	3.785 litres (l)

Government of Yemen

Fiscal Year

1st January – 31st December

Abbreviations and acronyms

ADCRMP	Al Dhala Community Resources Management Project
AREA	Agriculture Research Extension Authority
AWPB	Annual Work Plan and Budget
CAPS	Community Action Plans (*RGP*)
CBRIP	Community Based Resources Management Project
CBY	Central Bank of Yemen
CDAs	Community Development Associations (*RGP*)
CFs	Community Facilitators (*RGP*)
CFSS	Comprehensive Food Security Survey
COSOP	Country Strategic Opportunities Paper
CRU	Community Roads Unit
DA	Designated Account
DFR	Department of Forestry and Range
DPPR	Development Plan for Poverty Reduction
DPRDP	Dhamar Participatory Rural Development Project
EA	Exporters' Association
EIRR	Economic Internal Rate of Return
EOF	Economic Opportunities Fund (*IFAD*)
EOP	Economic Opportunities Programme (*IFAD*)
EU	European Union
FAO	Food and Agriculture Organization
FIP	Fisheries Investment Project (IFAD)
FMs	Field Managers (RGP)
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNI	Gross National Income
GOY	Government of Yemen
HDI	Human Development Index
HH	Household
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICBA	International Centre for Biosaline Agriculture
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
IFPRI	International Food Policy Research Institute
ITZ	Inter Tropical Convergence Zone
LNG	Liquefied Natural Gas
MDG	Millennium Development Goal
MFI	Micro-finance Institution
MFBIs	Micro-finance Banks/Institutions
M&E	Monitoring and Evaluation
MoAI	Ministry of Agriculture and Irrigation
MoF	Ministry of Finance
MoPIC	Ministry of Planning and International Cooperation
MoPWH	Ministry of Public Works and Highway
MSE	Micro and Small Enterprise
MoTI	Ministry of Trade and Industry
NAPA	National Adaptation Programme of Action

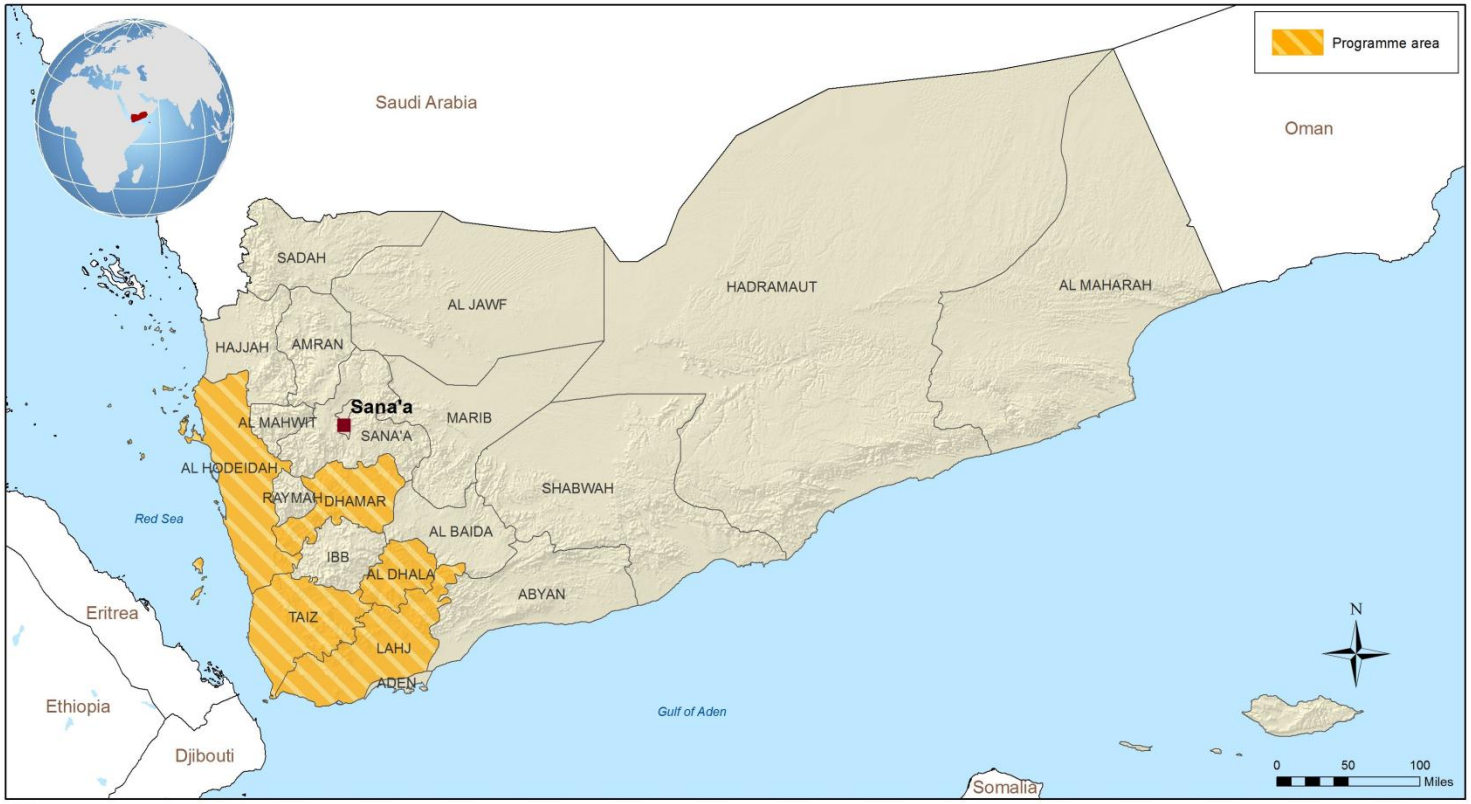
NENA	Near East and North Africa
NGO	Non-governmental Organization
NPCU	National Programme Coordination Unit
PIM	Project Implementation Manual (IFAD)
PWP	Public Works Programme (World Bank)
REP	YemenInvest - Rural Employment Programme (IFAD)
RGP	Rural Growth Programme (IFAD)
RIMS	Results and Impact Management System (IFAD)
SCA	Saving and Credit Association
SCG	Savings and Credit Group
SEDF	Small Enterprise Development Fund
SME	Small and Medium Enterprise
SMEPS	Small Micro Enterprise Promotion Service
SFD	Social Fund for Development
SO	Strategic Objective
UNDP	United Nations Development Programme
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development
USD	United States Dollar
VAT	Village Agriculture Technicians
VU	Village Unit (RGP)
WB	World Bank
YER	Yemeni Riyal
YSMO	Yemen Standardization, Metrology and Quality Control Organization

Map of the programme area

Republic of Yemen

Rural Growth Programme (RGP)

Design report



The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.

IFAD *Map compiled by IFAD* | 23-05-2013

Executive Summary

Summary and Objectives

In response to a request from the Government of Yemen (GoY), IFAD intends to upscale to incremental communities and governorates, the successful approaches, methodologies and activities of three closing IFAD-financed projects. The project addresses a range of development challenges including knowledge and skills, financial services, infrastructure, access to input and output markets, women's empowerment and strengthening their climate resilience in parallel with complementary interventions which create a virtuous cycle and a dynamic rural economy.

The programme's target group consists of poor food insecure rural households living in selected communities with a specific focus on women and youth1. At full development, the programme is expected to directly benefit around 1.2 million poor individuals (around 7% of the total rural population), of whom around 0.8 million live below the poverty line and around 0.4 million live marginally above it but remain highly vulnerable to economic shocks.

In order to reach this ambitious target IFAD has mobilized additional resources from its strategic partners in Yemen; the Islamic Development Bank, the European Union, the GEF and the ASAP as well as other local institutions, in particular the AFPPF and microfinance institutions. IFAD co-financing ratio for this project stands at 1: 5.48 (USD 15 million from IFAD and USD 82 million mobilized from co-financiers excluding GoY and beneficiaries).

The programme's goal is to reduce poverty and food insecurity in rural areas and increase smallholder climate resilience. Its development objective is to stimulate sustainable and resilient economic growth for women/men in rural communities.

Components

The programme consists of three complementary and mutually reinforcing technical components in addition to the programme management component. These are: (i) community empowerment and livelihoods diversification; (ii) natural resources management and resilient infrastructure; and (iii) agriculture development. Within these three components, the specific range of activities to be implemented in each Governorate will depend upon the specific socio-economic context, agro-ecological conditions and community demand, as captured in Community Action Plans.

Component 1: Community Empowerment and Livelihoods Diversification. The expected outcome of this component is: households and communities empowered to manage their own development and engage in income generating activities. Investment under this component includes: (i) community institutions building; (ii) women's empowerment; (iii) microfinance, and (iv) income generating activities;

Component 2: Natural Resources Management and Resilient Infrastructure. The expected outcome of this component is: Improved natural resource management focusing on climate resilience. Investments supported under this component will focus on: (i) drinking water; (ii) integrated water management and soil conservation; (iii) rangeland rehabilitation, and (iv) quarternary roads;

Component 3: Agriculture Development. The expected outcome of this component is: Improved climate resilient agricultural practices and technologies adopted. Investments under this component include: (i) extension support and inputs provision; (ii) irrigation efficiency; (iii) agriculture production and diversification, and (iv) applied research for vulnerability reduction.

[1] The national poverty line will be used as the definition of poor.

Background and rationale

Yemen is the poorest country in the Middle East, facing declining oil revenues, depletion of freshwater resources, and rapid population growth. Yemen is ranked as the 11th most food-insecure country in the world, with one in three Yemenis suffering from acute hunger (IFPRI, 2011). Just over half the rural population (51%) is food-insecure compared to 27% in urban areas (CFSS, 2012). Overall, 13% of children under five years old are acutely malnourished. Chronic malnutrition among children is also deeply worrying with nearly 60% of Yemeni children stunted.

Agriculture growth has lagged behind population growth since 2005, and the average productivity in agriculture, fisheries and forestry is low. Close to 50% of rural households have less than one ha of land, and 40% are landless. Combined with large household sizes and limited off-farm opportunities, this results in significant rural poverty in Yemen. It is considered fundamental for Yemen to diversify its economic base, reduce dependence on oil, increase agricultural production and productivity, and invest in sectors with high potential for market growth and job creation to reduce rural poverty and increase food security. The problem is aggravated by climate change which threatens to cause increased drought and unpredictable rainfall and hence constrained the growth of sustainable, diversified and resilient rural economies.

The previous IFAD funded projects have demonstrated that community-driven, area-based development programmes can successfully address these problems and reduce poverty and food insecurity while empowering remote rural communities and their women members in particular. In Dhamar governorate over 25 000 smallholders have already adopted new technologies, and 20 000 report increased yields; farmers using improved seeds report 33% yield increases, and those using improved beehives report 300-600% yield increases. About 90% of women's savings and credit groups, 70% of infrastructure management groups, and 80% of the 1 500 micro-enterprises promoted are still operating after three years. The average hungry period experienced by food insecure households has fallen from 6 months to 2.1 months. Similarly in Al Dhala governorate, one of the poorest and most insecure governorates in Yemen, about 5 000 women and men smallholders benefitted from community-led advisory services focusing on improved technologies (crop varieties, protected horticulture, drip irrigation). Project's investments in domestic water supply are estimated to save women from each household about USD 70 and 300 labor-hours p.a. (previously, round trips of 2-5 hours for women to collect water were common). Beneficiary contributions are relatively high, ranging from 30% for productive investments to 60% for domestic water schemes. Finally, the approach used by CBRIP has fostered community ownership, created permanent and seasonal jobs, and linked remote villages to markets and services. An impact study of Al-Shahel Road in Hajjah revealed that, within 3 years of construction, ownership of vehicles and appliances increased by 34%, livestock by 93%, and meat and milk production by 117%, while women's time spent collecting water and wood decreased by 30%. Trips from villages to the nearest market town have typically reduced in cost by USD 2.5-5.0 each; the costs of transporting wheat, gas cylinders and water have dropped by 50%.

The Rural Growth Programme will scale up, to incremental communities and governorates, the successful approaches, methodologies, and activities of three projects: (i) Dhamar Participatory Rural Development Project (DPRDP); (ii) Community Based Resources Management Project (CBRIP); and (iii) Al Dhala Community Resources Management Project; (ADCRMP) while placing a greater focus on climate resilience. These projects are considered to be flagship models for community development. The community organizations they established have given a voice, for the first time, to hundreds of thousands of poor rural women and men, empowering vulnerable groups (particularly the poor and women), helping them to participate in, and gain benefits from, the projects. Their community-led and gender-balanced extension models are recognized as an effective and sustainable mechanism for crop and livestock services. Impact studies indicate that the projects have substantially improved food security and incomes in targeted communities.

Although the previous IFAD projects in Yemen provided opportunities in terms of enhancing agricultural production, strengthening community-based planning and contributing to poverty

reduction, the possible impacts of climate change were not explicitly taken into account. However many of the development challenges faced in rural areas have their origin in natural resource management and are exacerbated by climate change. The vulnerability assessment undertaken for the design of the RGP has, based on a detailed modelling of climate change scenarios at the country level, identified a set of key risks and adaptive measures to guide decision making relevant to programme design and execution. Programme planning and implementation integrate the findings and recommendations of this assessment to ensure that climate change adaptation priorities are mainstreamed and contribute to disaster-risk reduction, set priorities for wise long-term investments and increase the resilience of target communities.

The RGP complements the ongoing country programme, and in particular the value chain oriented EOP, FIP and YIREP - by focusing on ensuring the provision of basic public goods and services currently lacking in rural areas in order to build resilience to climatic, economic, political and other shocks and to create an enabling environment for sustainable economic growth. The programme is consistent with all three strategic objectives of the 2008-2013 COSOP, namely to (i) empower rural communities, (ii) promote sustainable rural financial services and SMEs, and (iii) enhance food security of poor households.

The programme is aligned with the priorities of the Transition Plan for Stabilisation and Development 2012 – 2014, the Development Plan for Poverty Reduction 2012-2015, with the climate change adaptation priorities identified in Yemen's National Adaptation Plan of Action (NAPA), with the National Water Sector Strategy and Investment Program and the transitional MoPIC National Food Security Strategy, as well as with the Joint UN Framework to Support the Transition in Yemen which aims to provide an immediate, concerted and multi-dimensional response consistent with and complementary to existing humanitarian and development plans. Importantly it responds directly to the GCC Agreement's call for 'establishing and implementing an initial programme of economic stabilization and development and addressing the immediate needs of the population in all regions of Yemen'. Support for community-level institutions will ensure that they are effectively integrated within existing district and governorate administrative structures for sustainability and impact.

Rural context, geographic area of intervention and target groups

Socio-economic context. Yemen is a low-income country with an estimated population of approximately 24.8 million (2011). GDP amounts to USD 33.76 billion with GDP per capita averaging USD 1,361 in nominal terms (World Bank, 2011). The country is gradually emerging from a profound and complex political and economic crisis, stimulated by social unrest and the outbreak of violence in early 2011. The Gulf Cooperation Council (GCC)-brokered political agreement envisages a transition period until 2014, divided into two phases. Phase I included the February 2012 presidential election and ended with the inauguration of the new President. Phase II includes national dialogue, drafting the new constitution and general election. Massive poverty, unemployment, food insecurity, malnutrition, political and social exclusion, institutional weaknesses, economic inequities and power struggles are key drivers of the crisis.

Yemen is the poorest country in the Arabic Peninsula. While in 2008 about 40% of rural people were living below the national poverty line of USD 2 equivalent per day, the triple crises of recent years (food price crises, fuel price crisis, and global financial crisis) increased the incidence of poverty of rural poverty to 48% by end-2010. Following the political and social violence of 2011/12, it is now estimated that rural poverty has increased over 60% (early 2013), implying that around 15 million rural people live in poverty and food insecurity today. In addition, a large population segment living marginally above the poverty line remains highly vulnerable to economic and natural shocks. Malnutrition levels in Yemen are alarming: over 50% of children are chronically malnourished, and 60% are stunted. Global acute malnutrition levels of over 30% were recorded in 2011, and IFPRI's Global Hunger Index ranked Yemen among the ten hungriest countries in the world (before the impact of the 2011 crisis was felt). Over 80% of food-insecure people are rural, and rural-urban disparity is increasing. People in the highland and mountainous areas are the most vulnerable as shown by the

higher rates of malnutrition amongst children in the highlands compared with the other areas of the country.

Yemen has a human development index (HDI) of 0.462, and ranks 154th of 169 countries rated in 2011 (HDR, 2011) well below the average HDI of the Arab Nations region of 0.641. The gender inequality index is 0.769 (HDR, 2011 against 0.835 in 2010), amongst the lowest in the world, indicating serious gender inequalities in participation, representation, and economic and social development. The political and social violence of 2011/12 has not yet been integrated in these figures but a worsening of the situation is expected.

Low agricultural productivity, water scarcity, climate change, insufficient off-farm economic and employment opportunities, high rural population growth together with high dependency ratios constitute critical negative factors affecting rural areas and worsening rural poverty. Limited resources, especially water, and lack of access to basic services are major factors in the increasing migration from rural areas with mountainous villages and settlements in particular being increasingly abandoned in the search for employment opportunities, and better education and health services in urban areas. Access to transport, health and education is significantly worse in smaller settlements (less than 1 000 inhabitants) and these are typically found in highland areas. This already dire situation is bound to get worse with the projected negative impacts of climate change on especially water availability and the increased risks associated with extreme rainfall events. Official unemployment rose from 12.0% in 2000 to 16.5% in 2006 and to around 19% in 2011. The low labor force participation rate (42%) suggests that real unemployment is much higher and underemployment is a major problem in rural areas, especially for youth, with much employment being on a casual basis with businesses owned by extended family members.

Yemen is one of the most water-scarce countries in the world. The level is less than one tenth of the threshold for water stress, which is defined as 1,700 m³/capita/year. In highland governorates, less than 20% of communities have access to safe drinking water from public water supply projects whilst 60% of settlements rely on unprotected springs and wells and 20% on cisterns, streams and tanks. Total water demand of 3,400 million m³ per year exceeds renewable resources of 2,500 million m³ per year, thus leading to a steady decline in groundwater levels, varying between 1 m/year in the Tuban-Abyan area and 6–8 m/year in the Sana'a basin. The public supply of water, where available, is erratic.

Yemen's infrastructure is weak, unreliable and subject to frequent disruptions, often as a result of flooding. The rehabilitation and further development of roads, communication networks, water networks and other infrastructure elements require consideration of both current challenges and projected climatic impacts2. Yemen has close to 60 000 km of dirt tracks and trails compared with around 16,800 km of asphalted roads (MoPWH; 2012). Around 20% of settlements in the highland areas have no access roads while around 70% of settlements can be accessed only by uneven dirt roads. As these roads are presently in poor condition due to regular damage by flooding and inadequate maintenance, an alarming share of the rural population is effectively cut off from participation in the market economy and access to vital services, diminishing the quality of life and reinforcing poverty. Lack of road access reduces the capacity of these people to prepare for and cope from natural disasters as people, food and supplies cannot be moved in or out of affected areas easily.

The project area and targeting approach. The programme will scale up successful activities implemented under the DPRDP and DCRMP within Dhamar and Al-Dhala governorates to reach additional communities, and expand to Hodeida, Lahej and Taiz governorates while strengthening their climate resilience. These five governorates have relatively high population density, substantial rural poverty, and serious food insecurity and all have large areas identified as hotspots of climate change vulnerability.

[2] World Bank (2010). "Making Transport Climate Resilient Country Report: Mozambique"

The programme's target group will consist of poor food insecure rural households living in selected communities with a specific focus on women and youth3. However, other households will also benefit from programme's investments in public goods such as roads and community schemes for drinking water. Transparent targeting procedures, based on mechanisms applied by ongoing projects will be implemented including geographic, direct targeting and enabling measures. Efforts will be made to ensure involvement of women in decision-making and leadership positions in community organizations. At full development, the programme is expected to directly benefit around 1.2 million individuals, of whom around 0.8 million live below the poverty line and around 0.4 million live marginally above the poverty line but remain extremely vulnerable to shock.

To maximize the impact of programme activities and avoid geographically scattered interventions, the programme's intervention unit will be the 'Village Unit' (VU) averagely composed of 3 to 5 settlements, each having an average of 75 to 100 households (i.e. approximately 600 inhabitants per settlement). A total of 550 Village Units will be established over years 1 to 3 in the most vulnerable districts of the five selected governorates. The selection of VUs will be conducted on the basis of the latest poverty assessment and the climate vulnerability assessment undertaken during project design. The VU selection process will give emphasis to remote, mountainous areas within each district where living conditions are significantly more difficult and poverty most acute. The vulnerability assessment will identify those VUs: (i) most suitable for stone terrace rehabilitation; (ii) most vulnerable to soil erosion; (iii) most vulnerable to flood risks; and (iv) most vulnerable to changed cropping potential. This ensures that project activities address the most pressing needs of selected VUs. Agreements will be required from communities: (i) not to utilize programme support for existing qat farms or to increase the area under qat cultivation, and (ii) to establish, as required specific user groups to manage all programme constructed infrastructure and the land and water resources utilized by the VU.

Benefits

A total of about 176 000 households (c. 1.2 million people) is expected to benefit from the programme interventions. More specifically the programme will support the following:

- implementation of Community Action Plans in each of the 550 VUs integrating climate adaptation priorities based on vulnerability assessment enabling them to participate in the planning of their own development. Users' associations with responsibility for operation and maintenance of infrastructure for water harvesting, drinking water, land conservation, roads, and renewable energy will be established;
- construction of 275 water harvesting structures with a catchment area of 1 340 ha (around 13 400 households), developing access to drinking water in 120 village units (38 400 households) and restoring 1 150 ha of abandoned terraces to productive use (11 500 households) as well as climate-proofing at least 244km of rural roads;
- increasing agricultural production as a result from better access to inputs, more efficient drip irrigation systems on 3 338 ha (33 380 households), improved agriculture diversification through greenhouses for 27 500 households and provision of updated technical assistance by 1 100 VATs (1 male and 1 female in each VU). It is assumed that 70% of farmers and livestock keepers will adopt some improvements to their techniques and technologies benefiting 123 200 households through crop yield increases of around 30% on average, improved fodder production and livestock husbandry;
- economic opportunities provided to around 66 000 individuals (of whom at least 50% women) in expanding income generating activities and micro- and small enterprises using skills gained in literacy, life-skills, business management and technical trainings. 100 000 individuals will benefit from enhanced access to financial resources through Saving and Credit Groups and Associations and later through their linkage with licensed microfinance banks. Improved access to drinking water will reduce time and labor women and girls spent in water collection and

[3] The national poverty line will be used as the definition of poor.

enable women to focus more on education, training and productive activities. Construction/rehabilitation of at least 244km of village roads benefiting 150 000 people (c. 700 beneficiaries per km) will reduce transportation costs and travel time, improve access to inputs, and increase income.

Implementation arrangements

The programme's governance will be threefold: (i) District Coordination Groups (DCGs) (ii) Governorate Steering Committees (GSCs); and (iii) a National Steering Committee. DCGs are located in each district selected under the programme and headed by the General Secretary of the District Council. The main responsibilities of each District Coordination Group will include: review of CAPs, coordination between stakeholders and local partners; and conflict resolution. GSCs will be established in each governorate and chaired by the Governor. The main responsibilities of each GSC will include: approval of Governorate Annual Work Plan and Budget, coordination between all stakeholders, coordination with Governorate development plans; review progress reports and performance of programme's activities; resolve any implementation issues and provide guidance to PMUs. A National Steering Committee is established in Sana'a and chaired by the Minister of Agriculture and Irrigation. Its major role will be to: provide strategic and policy guidance for programme implementation, approve the overall AWPB, recruit the audit firm and approve its report, review recruitment process and endorse the selection of PMU Managers and key staff, review progress reports and performance, and resolve implementation problems not resolved at lower levels.

In line with the community-driven development approach, CDAs at Village Unit level will be considered the first level of programme planning and implementation. At each governorate level, the coordination of programme planning and implementation will be the responsibility of the Programme Management Unit (PMU) reporting to the Governorate Steering Committee (GSC). Overall coordination at national level and support for cross-cutting issues will be provided by a National Programme Coordination Unit (NPCU) located in Sana'a and reporting to the National Steering Committee.

The PMU at Governorates level will be mainly responsible for the procurement and supervision of service providers, contract management, and mobilizing and managing relationships with target communities. while the majority of programme investments and activities will be implemented through partnerships with the relevant line Ministries, externally-financed programmes and the private sector (incl. NGOs). PMUs will coordinate closely with the Governorate, District and Uzla administration to ensure that planning at VU-level feeds into District and Governorate development plans. In addition, each PMU will play an active role in the capacity building of the local administration. All staff members will be recruited on a competitive basis in compliance with IFAD's procurement guidelines. All staff contracts will be for an initial probationary period of six months compliant with Yemeni labor law, with the possibility of extension subject to satisfactory performance.

To ensure sustainability and ownership by the local population and continuity of activities after its completion, the RGP will ensure that PMUs are gradually integrated within the Governorate administrative structure. The RGP Mid-term review will assess feasible options for this integration, based on outcomes of the ongoing National Dialogue and transition process and its impact on the decentralization process.

Each PMU will be headed by a Programme Manager (PM) with expertise in agriculture/rural development and staffed with a small team of professionals: (i) an accountant; (ii) a procurement officer; (iii) an M&E officer; (iv) a rural engineer, and (v) a gender and community development officer.

National Programme Coordination Unit. A National Programme Coordination Unit (NPCU) is established in Sana'a and reports to the NSC. The NPCU will provide PMUs with services related to cross-cutting and cross-governorate issues and oversight and supervision of the works at the PMUs level including periodic auditing. Its staff will be competitively recruited. The NPCU will include the following positions: (i) Programme Director; (ii) Finance Manager; (iii) Internal Auditor; (iv) 2 Consolidation accountants; (v) Senior M&E and KM specialist; (vi) Senior Procurement Officer; (vii)

Environment and Climate-Change Specialist; (viii) Business Management/Rural Finance specialist, and (ix) Secretary.

Costs and financing

The programme will be financed by: IFAD resources of USD 15.0 million in the form of a grant (11.8% of total costs); Islamic Development Bank resources of about USD 15.0 million in the form of a loan (11.8%); European Union resources of about USD 16.0 million equivalent in the form of a grant (12.6%); Global Environment Facility resources of USD 10.0 million (7.9%); Adaptation for Smallholder Agriculture Programme resources of USD 10.0 million (7.9%); microfinance banks/institutions' contribution of about USD 17.7 million (14.0%); Agriculture and Fisheries Production Promotion Fund resources of about USD 12.8 million (10.1%); beneficiaries' contribution of about USD 21.0 million mainly in-kind (16.6%), and Government resources of about USD 9.3 million (7.3%). The Government's contribution covers the cost of duties and taxes as well as some investment costs for roads.

Risks

The programme's risks have been assessed and mitigated in the design. Residual risk is moderate or exogenous. The programme's design draws lessons from ongoing IFAD investments in Yemen, as well as those of other financiers and partners. The project's to be scaled up (ADCRMP, DPRDP, and CBRIP) were amongst the few projects to successfully continue implementation during the crisis. This was due to the facts that insecurity was mainly in urban areas and the projects themselves actually contributed to improving security in their project areas. Additional risks are mainly related to the weak governorate structure a reason which led to the creation of semi-autonomous project management units at both the national and the governorates levels.

Environment

As the RGP is essentially a programme designed around reducing vulnerability of target populations, the environmental and social impacts and risks as well as mitigation measures for each component and its activities were assessed during the design stage. As most activities have already been implemented by projects that the RGP is scaling-up, important lessons have been learned with regard to minimizing negative and maximizing positive social and environmental outcomes – particularly with regard to the undertaking of environment impact assessments.

These lessons learned have been embedded in the programme design. However, any potential impact will be assessed and quantified during programme implementation. The PMU will be responsible for ensuring that requirements of the environmental legislation of Yemen are adhered to in order to avoid negative impacts, and, when and if necessary, introduce appropriate mitigation measures. On this basis, it is proposed to classify the programme under Category B.

Knowledge management, innovation and scaling up

The programme innovative features rest on its intend to scale-up proven approaches and modalities for community-driven, area based development in insecure and conflict affected environments from three IFAD-financed projects into a single national programme, initially targeting five Governorates but with the possibility to expand further if additional financing is mobilized. Additionally, the programme is built around vulnerability reduction and will adopt several approaches to address the issues related to climate changes and its impact on the rural economy.

The programme intends also to capture the operational experiences and generate lessons and best practices to be shared with public institutions, the IFAD country team, partners and others. The programme will promote: (i) in-country knowledge networking through periodic seminars/workshops; (ii) regional knowledge networking such as Karianet, and (iii) regional research networks including those supported by IFAD grants. The IFAD country team will contribute to in-house knowledge sharing and networking. Special emphasis will be placed on knowledge regarding climate change adaptation and disaster-risk development planning.

Logical Framework

Objective Hierarchy	Key Performance Indicators	Means of Verification	Risks/Assumptions
Goal			
Poverty and food insecurity reduced and smallholder climate resilience increased	• 800,000 poor rural people/120 000 HHs lifted out of poverty [Total outreach1.18 million individuals/176,000 HHs]. • 800,000 poor rural people/120 000 poor smallholder HHs increased climate resilience - ASAP • 50% reduction in average length of hungry period amongst beneficiaries • Reduction in chronic child malnutrition (Baseline in rural areas [2012]: 63.5%) • Increase in HH asset ownership index (compare to baseline)	Baseline & impact surveys Government data (CSO) UNDP/World Bank poverty assessment UNICEF/WFP food security assessments	Improved security (A) Improved macro-economic conditions (A) Stable political transition (A)
Programme Objective			
Resilient and sustainable rural economic growth stimulated	• USD 500 increase in household income ($300 farm income and $ 200off-farm) through economic diversification and access to financial services by project end • % reduction in transport costs • 38400 HH in 120 villages access drinking water through the construction of 275 water harvesting structure • 1150 ha of abandoned terraces restored • 3338 ha equipped with drip irrigation • Number of Ha made more efficient and climate resilient • % increase in the Community Capability Index (CCI)[4] as compared to baseline – ASAP	Baseline and impact survey	
Outcomes and Outputs by Component			
Component 1: Community Empowerment and Livelihood Diversification			

[4] The CCI is the IFPRI tool used to measure community capabilities in the domain of natural resource governance.

Objective Hierarchy	Key Performance Indicators	Means of Verification	Risks/Assumptions
Outcome 1: Rural Households and community empowered to manage own development and engage in income generating activities	• At least 50% of CDAs with medium-term climate resilient CAPs, reviewing them annually - ASAP • HH average savings increases by USD 300 after 5 years compare to baseline • #, value, and size of loans by SCGs (> 400 000 loans; USD 48 million; USD 120) and MFIs/commercial banks (> 11 000 loans; USD 8 million; USD 750)	Baseline & impact surveys CDA reports Interviews/focus groups Programme administrative reports SCAs and MFIs records	Traditional views of women's role in family and society can be changed (A)
Output 1.1: Representative CDAs established / strengthened	• 550 CDAs formed, strengthened and legally registered • 30% of leadership positions in CDAs held by women	CDA reports Field staff reports Programme administrative records SCGs/SCAs reports MFBIs reports	Intra-community conflicts prevent formation of effective CDAs (R) PFIs unwilling to partner with SCAs (R)
Output 1.2: Basic/vocational training provided for women target groups	• Literacy/life skills training received by at least 50 000 women • Vocational training received by at least 30 000 women		
Output 1.3: Basic financial services made available	• SCGs established with 100 000 members (at least 70% women) • At least 70% of SCGs have access to financial resources from MFIs		
Output 1.4: Income generating activities promoted	• At least 50 000 beneficiaries establish or expand an additional agric. and/or non-agric. income generating activity (of whom at least 50% are women) (ASAP)		
Component 2: Natural Resources Management and Resilient Infrastructure			
Outcome 2: Natural resource management improved and focusing on climate resilience	• USD 55 million worth of new/existing rural infrastructure, including irrigation systems, made climate resilient - ASAP • 1 hr/day/HH reduction in time spent collecting water as compared to the current 4hr/day/HH • 275 Soil and water conservation schemes proposed within CAPs implemented – ASAP	CDA reports Programme administrative reports Studies & surveys	

Objective Hierarchy	Key Performance Indicators	Means of Verification	Risks/Assumptions
Output 2.1: Integrated water management plans implemented in target areas	• Water harvesting and storage capacity increased by 30% in all target areas compared to baseline • 1 220 ha of agricultural land rehabilitated and back in production - ASAP	Baseline & impact surveys CDA reports Field staff reports Programme administrative records WUAs & LMAs reports	Communities within watersheds willing to collaborate to plan and implement watershed management development schemes (A)
Output 2.2: Rangeland rehabilitated and carrying capacity increased	• 80% of rangeland rehabilitation schemes (including reseeding and eradicating non-beneficial species) within CAPS are implemented • 50 rangeland resource assessment and monitoring plans developed and functional		
Output 2.3: Rural infrastructure made more resilient	• At least 244 km of quaternary roads upgraded and constructed with strengthened climate resilience, including features to protect against flood damage and to harvest water - ASAP • Overall transportation cost reduced by USD 4 compare to baseline • At least 80% of the dry season drinking water supply measures proposed by the CAPs are implemented.	Baseline & impact surveys CDA reports Field staff reports Programme administrative records WUAs & LMAs reports	Communities willing to collaborate to plan and implement public infrastructure projects and to participate in their financing (A)
Component 3: Agriculture Development			
Outcome 3: Improved, climate resilient agricultural practices and technologies adopted.	• At least 70% of smallholders in each target community adopt resilient agricultural practices or technologies[5] by completion - ASAP	Baseline & impact surveys CDA reports Government data (MoAI, MoTI, YSMO)	Farmers willing to adopt new technologies (A)

[5] In RGP, climate resilient practices or technologies refer to adoption of one or a combination of the following: Soil and water conservation practices / Drought or salinity or heat tolerant crops / Conservation Agriculture practices / crop rotation / water-saving technologies / crop-livestock integration / additional agriculture and non-agriculture income-generating activities

Objective Hierarchy	Key Performance Indicators	Means of Verification	Risks/Assumptions
Output 3.1: Livestock and agricultural production made less vulnerable	• 10% in livestock mortality compared to baseline decreased • HH income from livestock and agricultural production increased by 20%	Baseline & impact surveys CDA reports Field staff reports Programme administrative records Governmental institutions records Contracts with third parties	Communities willing to invest (A) Farmers willing to engage in breed improvement (A)
Output 3.2: Efficient irrigation practices and technologies adopted	• 50% of existing irrigation systems are made more efficient and climate resilient– ASAP • 30% in yields/unit of water used increased - ASAP		
Output 3.3: Alternative cropping practices tested and adopted	• 20% decrease in post-harvest losses by completion (banana/tomato/potato) • 35 ha covered under conservation agriculture practices • 10% of CAPs test alternative crops and cropping practices (introduction of drought/salinity/heat tolerant crop) – ASAP • Climate suitability scenarios developed for alternative crops in 5 Governorates		

I. Introduction

1. In 2012, the Government of Yemen (GoY) requested IFAD to develop a programme focused on scaling-up, to incremental communities and governorates, the successful approaches, methodologies and activities of three on-going IFAD-financed projects: the Dhamar Participatory Rural Development Project (DPRDP) which completed in December 2012; the Community-Based Rural Infrastructure Project (CBRIP) which completed in March 2013, and the Al-Dhala Community Resource Management Project (ADCRMP) which will be fully disbursed by late 2013. The programme would contribute to the objectives of the Transition Programme for Stabilization and Development, boost incomes and food security, and increase climate resilience. A concept note was developed, agreed with Government and approved by IFAD management in June 2012.

2. The programme design process included a series of field missions (surveys, studies, modular design proposals) involving both national and international consultants, and supported by the ICO, CPMT, PMUs, Government and other partners[6]. This process was informed by a detailed assessment of climate change vulnerability in Yemen undertaken by climate modeling experts with extensive experience in modeling the impacts of climate change in Yemen. The assessment was instrumental in identifying key climate change impacts and related hazard 'hotspots' at a local level, which informed the design of programme interventions. The findings of the assessment will be further used to guide implementation of programme activities.

3. The programme design process benefitted from intensive consultations with the three IFAD-financed projects to be scaled-up, the concerned ministries: Ministry of Planning and International Cooperation (MoPIC), Ministry of Agriculture and Irrigation (MoAI), Ministry of Public Works and Highways (MoPWH), and all co-financing and implementation partners including the European Union[7], Islamic Development Bank[8], Agriculture and Fisheries Production Promotion Fund, microfinance institutions, the World Bank-financed Public Works Project, the Community Roads Unit at the MoPWH, UNDP, SMEPS, and GIZ.

II. Strategic context and rationale

A. Country and Rural Development and Poverty Context

4. **Economic, Policy, Governance and Institutional Issues**. Yemen is a low-income country with a population of 24.8 million (2011). GDP amounts to USD 33.76 billion with GDP per capita averaging USD 1,361 in nominal terms (World Bank, 2011).

5. The country is gradually emerging from a profound and complex political and economic crisis, stimulated by social unrest and the outbreak of violence in early 2011. A Gulf Cooperation Council (GCC) brokered a political agreement envisages a transition period until 2014, divided into two phases. Phase I included the February 2012 presidential election and ended with the inauguration of

[6] Mr. Thierry F. Mahieux (Team leader - Rural Finance Expert [consultant]) visited Yemen from 6 December, 2012 to 9 February 2013, from 8 – 28 April 2013, and, 16 - 30 July 2013. Ms. Helen Lackner (Sociologist [consultant]) visited Yemen in September 2012. Ms. Lakshmi Moola (Finance Officer - IFAD) visited Yemen in April and July 2013. Ms. Dina Nabeel (NEN Portfolio Advisor - IFAD), Ms. Alexandra Sokolova (Economist -FAO/Investment Center), Mr. Rami Salman (Regional Climate and Environment Advisor - IFAD), Ms. Wafa Al-Khoury (Senior Technical Advisor on Agronomy - IFAD) and Mr. Mekki Omer (Agriculture Specialist - consultant) visited Yemen in July 2013. Mr. Abdulhafeedh Karhash (Agriculture Specialist, MoAI), Mr. Najib Al-Ghulaibi (Hydraulic Engineer [consultant]), Mr. Naji Abu-Hatim (Rural Development Specialist [consultant]), and Mr. Abdulkarim Al-Sabri (Irrigation and Water Management Specialist [consultant]) also participated in the design process. Dr. Fathia Bahran (Country Programme Officer - IFAD) supported the design process. Mr. Omer Zafar (former CPM - Yemen) joined the mission in April 2013. Mr. Mohamed Abdelgadir (CPM Yemen) joined the mission in April and July 2013.

[7] The missions held several meetings with the EU country office and the ICO accompanied the EU on field visits to the DPRDP programme area which led to the development of a co-financing agreement, subject to final approval by Brussels.

[8] The Islamic Development Bank conducted a design mission from January 8th to 15th and from April 20th to 28th, with support from the ICO and members of the IFAD design team. A Loan Agreement between IsDB and the GoY has been signed in July 2013 to finance the Rural Growth Programme.

the new President. Phase II includes national dialogue, drafting the new constitution and general election. Massive poverty, unemployment, food insecurity, malnutrition, political and social exclusion, institutional weaknesses, economic inequities and power struggles are key drivers of the crisis.

6. From 2000-2010, security concerns, a slowdown in economic reforms, reduced private sector investment and declining oil production limited economic growth to around 3.7% p.a. with a slight increase to 6.2% in 2010 due to exports of LNG and favorable oil market conditions. However, following the crisis, the GDP was reduced by 10.5% in 2011 with a further contraction of 1% in 2012. The crisis has exacerbated the trend of deteriorating economic fundamentals - declining oil production, increasing fiscal and current account deficits, rising inflation and severe unemployment - with a dramatic impact on malnutrition and poverty. Continual interruptions to oil exports, due to violence and sabotage of pipelines and oil facilities since 2011 are worsening this problem. The crisis will have both short and long-term impacts on poverty, employment and investment which have not yet been fully felt. Considering the existing disparity between rural and urban areas, the impact will likely be worst in rural areas.

7. Since 2005 Yemen has implemented two phases of a National Reform Agenda (2006 and 2008) and improved business regulations, amended foreign direct investment and taxation laws, liberalized trade and enacted a new microfinance law. It has also adopted important legislation on public procurement and financial management, a financial disclosure law and anti-corruption measures[9]. In 2010 Parliament approved new investment, taxation and customs legislation, which are simplified, and investor friendly and which aim to diversify the economy. As a result, Yemen's IFC/WB Doing Business ranking improved from 123rd place in 2008 to 105th in 2011. Yemen ranks particularly highly with regard to starting a business, dealing with construction permits, registering property and enforcing contracts. Administratively Yemen is divided into Governorates, Districts and the smallest unit - the *uzla* - consisting of a few thousand households. A Decentralization Law came into effect in 2002 but has not yet been fully implemented due to lack of financial resources. Accelerating the process of decentralization is expected to be a major priority of the Transitional Government, including of agricultural and other services. Strengthening of Governorate, District and uzla level capacity for planning and implementation of development projects will be essential to the success of the decentralization process..

Poverty

8. Yemen is the poorest country in the Arabic Peninsula. While in 2008 about 40% of rural people were living below the national poverty line of USD 2 equivalent per day, the triple crises of recent years (food price crises, fuel price crisis, and global financial crisis) increased the incidence of poverty of rural poverty to 48% by end-2010. Following the political and social violence of 2011/12, it is now estimated that rural poverty has increased over 60% (early 2012), implying that around 15 million rural people live in poverty and food insecurity today. In addition, a large population segment living marginally above the poverty line remains highly vulnerable to economic and natural shocks.

9. Yemen has a human development index (HDI) of 0.462, and ranks 154th of 169 countries rated in 2011 (HDR, 2011) well below the average HDI of the Arab Nations region of 0.641. The gender inequality index is 0.769 (HDR, 2011 against 0.835 in 2010), amongst the lowest in the world, indicating serious gender inequalities in participation, representation, and economic and social development. The political and social violence of 2011/12 has not yet been integrated in these figures but a worsening of the situation is expected.

10. Low agricultural productivity, water scarcity, climate change, insufficient off-farm economic and employment opportunities, high rural population growth together with high dependency ratios constitute critical negative factors affecting rural areas and worsening rural poverty. Limited resources,

[9] Yemen has a Corruption Perception Index score of 2.1 in 2011 (164th of 182 countries - 2.2 in 2010) indicating significant lack of transparency in Government institutions.

especially water, and lack of access to basic services are major factors in the increasing migration from rural areas with mountainous villages and settlements in particular being increasingly abandoned in the search for employment opportunities, and better education and health services in urban areas. Access to transport, health and education is significantly worse in smaller settlements (less than 1 000 inhabitants) and these are typically found in highland areas. This already dire situation is bound to get worse with the projected negative impacts of climate change on especially water availability and the increased risks associated with extreme rainfall events.

11. Official unemployment rose from 12.0% in 2000 to 16.5% in 2006 and to around 19% in 2011. The low labor force participation rate (42%) suggests that real unemployment is much higher and underemployment is a major problem in rural areas, especially for youth, with much employment being on a casual basis with businesses owned by extended family members. Unofficial data show unemployment reaching 35% with a peak up to 60/70% in rural areas. Graduate and youth unemployment rates are above 60%. Field visits and meetings with rural communities in the programme area during the design process have confirmed these estimates.

12. Population pressure is also making poverty reduction increasingly difficult. The annual population growth rate is averaging 3.2% for the past 10 years, among the highest in the world, and the population is very young, with a median age of 18.1 years. It is estimated that around 43.3% of all Yemenis are below the age of 15 and 78% are below the age of 30. The population is expected to reach almost 40 million by 2025 should fertility rates remain at their current levels (4.45 children per woman; 30th in the world; UNDP).

Climate change

13. Climate change models unanimously project that temperatures will increase across Yemen over the next few decades by levels higher than the projected global average[10]. While these models agree on temperature, they disagree on the direction of change in precipitation levels. Most of these models project a modest increase in precipitation, while others point to a reduction in precipitation. The discrepancy is mainly attributed to the location of Yemen in the Inter-Tropical Convergence Zone (ITCZ) which has highly unpredictable climate patterns[11]. It is however projected that climate change will drive up the variability of precipitation leading to more frequent and intense rainfall events and more extended droughts. These projected changes are generally expected to aggravate existing problems facing socio-economic development and present additional development challenges to international development agencies including IFAD. In the absence of adequate adaptation measures, extreme rainfall events could turn into devastating flash floods that erode soil, destroy crops, buildings and infrastructure and claim lives of unprepared victims, as happened in Hadramout in 2008. They pose significant risk to the livelihood of rural communities - particularly the poor, women and the marginal groups. Droughts will accentuate the severe water scarcity in Yemen and will have a detrimental impact on agriculture, particularly rain fed agriculture which constitutes the economic mainstay for the majority of the rural population, reducing the area of viable rain fed land.

14. Taking the impact of projected climate change scenarios into account will increase the feasibility of investments whose return may be only marginal under current climatic conditions. Making investments climate resilient, while requiring possible higher initial investments generates, over time lower operational and maintenance costs and higher more sustained benefits.

15. A recent World Bank study (WB, 2011) found that vulnerability to climate change in Yemen is correlated strongly with low and limited sources of income, and with distance from urban areas. A key driver of this vulnerability is food prices: a recent IFPRI study indicates that over the period 2000-2050, climate change will push up world prices of food staples significantly in excess of increases which would take place without climate change. Given that Yemen is a net importer of important food

[10] World Bank (2010) “Yemen: Assessing the Impacts of Climate Change and Variability on the Water and Agricultural Sectors and the Policy Implications”.
[11] Wilby (2009) “An Evaluation of Climate Data and Downscaling Options for Yemen”.

staples such as wheat and rice, climate change will aggravate the current food insecurity in Yemen. While smallholders may benefit from increased agricultural productivity and rising food prices, rural non-farm households will be hardest hit in all scenarios. Adaptation to climate change will require both building resilience to potential negative impacts and taking steps to ensure potential benefits are realized wherever possible. Farmers will have to build their capacity to manage risks from unpredictable and heavier rains, and invest in rainwater harvesting and storage. Smallholders will also need to be made aware of options to adapt agricultural practices to shifting rainfall patterns and higher temperatures, and to shift production of climate-change vulnerable crops towards crops which are more suited to the projected conditions (an IFPRI study, 2011 already identified the potential increase of sorghum production in the red Sea and Tihama plain - Hodeida and Taiz governorates). An essential channel for increasing climate resilience will be to increase incomes and reduce reliance on rain fed agriculture.

16. **Climate Vulnerability in the Programme Area.** Being aware of the challenges posed by climate change impacts on project interventions, IFAD undertook a detailed vulnerability assessment to help analyse and guide project design and implementation, in an effort to improve climate resilience, minimize risk and maximize potential benefits. The main aim of this assessment was to create spatial estimates of climate hazards such as flash-flooding and soil erosion and potential opportunities such as water harvesting (by stone terraces), and cropping potential (for sorghum) in Yemen.

17. The methodology used GIS-based modelling to evaluate flood and soil erosion risks, opportunities for water harvesting in stone terraces, and potential impacts on crop productivity using meteorological observations and soil survey data, remotely sensed (precipitation and vegetation) indices, topographic information, and geo-statistical techniques). Because of the considerable uncertainty in global/regional climate model projections for Yemen, especially for regional rainfall changes, it was necessary to apply a sensitivity analysis as part of the assessment. The analysis used four scenarios for mean annual precipitation: -20%, no change, +20%, and +40%; as well as four scenarios for mean annual temperature: no change, +1°C, +2°C, and +4°C. These sensitivity scenarios cover 90% of uncertainty in the climate model projections for Yemen by the 2050s.

18. To increase the utility of the hazard data, the national level hazard analysis was downscaled to the level of village units for each target Governorate. Through overlaying hazard maps with the VU selection criteria related to population and accessibility a total of 627 Village Units were identified as hotspots for one or all of flash flooding, soil erosion, changes in cropping potential or stone terrace potential. The analysis will help in prioritising the most vulnerable village units for programme support based on confirmation of the analysis using field data and local knowledge.

Table 1: Outcomes of Climate Change Vulnerability Assessment

Governorate	VUs	Area (km^2)	Hotspot				Settlements (pop. > 100)	Total Pop.	VUs w/all factors
			Crop Potential	Stone Terrace	Flash Flood	Soil Erosion			
Al Dhala	82	643	75	72	15	28	625	28 580	2
Dhamar	111	1 015	48	80	44	94	1 005	307 848	23
Hodeidah	145	2 133	136	13	107	107	1 168	332 467	9
Lahej	132	816	132	60	43	123	1 050	197 771	12
Taiz	157	428	30	15	58	137	1 420	283 634	2
TOTAL	**627**	**5 035**	**421**	**240**	**267**	**489**	**5 268**	**1 150 300**	**48**

19. Each target governorate presents a different vulnerability profile as show in the table. The majority of VUs in Al Dhala were identified based on vulnerable cropping potential and scope for stone terrace rehabilitation/construction. Dhamar is dominated by VUs with stone terrace and soil erosion potential. Hodeidah has the most VUs with vulnerability to flash floods but also large numbers sensitive to soil erosion and changes in cropping potential. Lahej has a large number of VUs with sensitive to soil erosion and changes in cropping potential as well as a large incidence of flash flood

vulnerability. Taiz has the greatest number of VUs with soil erosion potential and many VUs vulnerable to flash flooding.

Food Security

20. Malnutrition levels in Yemen are alarming: over 50% of children are chronically malnourished, and 60% are stunted. Global acute malnutrition levels of over 30% were recorded in 2011, and IFPRI's Global Hunger Index ranked Yemen among the ten hungriest countries in the world (before the impact of the 2011 crisis was felt). Over 80% of food-insecure people are rural, and rural-urban disparity is increasing. People in the highland and mountainous areas are the most vulnerable as shown by the higher rates of malnutrition amongst children in the highlands compared with the other areas of the country.

21. National food security is dependent on the Government's ability to finance food imports to compensate for production shortfalls - Yemen imports 70% of all cereals, 90% of wheat and 100% of rice. The Government's food import budget depends on Yemen's balance of payments, exports and hard currency reserves. Yemen currently uses 25% of total export revenues to finance food imports, compared to a regional average of 11.5%. Declining oil revenues seriously threaten Yemen's balance of payments, and hence the capacity to finance food imports. Potential substantial increase in agricultural productivity through access to modern inputs and technologies are hampered by poorly-managed natural resources, qat cultivation and unstructured value chains and poor access to markets.

Gender

22. Yemen is characterized by serious gender gaps. Women's secondary status and their poor access to services and resources pose a major constraint to development. Women are largely excluded from the market economy. National illiteracy (70% for female against 29.5% for male - an average school life expectancy of 7 years for girls against 11 years for boys), immobility, lack of control over fertility (4.45 children per woman - among the highest rate in the world), limited access to credit despite improvements due to microfinance institutions and projects that are mainly focusing on women, limited access to jobs (labor force participation rate of 0.271), limited access to opportunities for participation in decision-making and limited legal rights reduce the immediate quality of life of women, as well as their potential contribution to raising standards of living.

23. Women, especially rural women and girls, fare worse than men on almost all quality of life indicators. The illiteracy rate for women in rural areas is 85% compared with 36% for men. In rural areas, only 30% of girls compared to 75% of boys are enrolled in primary school, and enrolment of girls at higher levels is negligible. Despite significant impact of gender-focused microfinance programmes and institutions, women still lack access to credit due to procedural complexities, lack of collateral due to a lack of land ownership and low awareness. In addition, restrained access to public transport severely restricts women's access to public services.

24. Despite this, women are the mainstay of agriculture, accounting for more than 60% of crop labor and more than 90% of livestock. Animal traction and marketing remain the only activities which are predominantly undertaken by men. Women also bear the brunt of all household tasks, child care and family care. In particular, they can spend up to 3 hours per day in water collection. Although women undertake most of the work, they have little involvement in decision-making. All household purchases are traditionally made by men, including basic food purchases. Although many women are left to manage the farm and household whilst their husbands seek work elsewhere. Educating and empowering women is a key to raising household income and enhance the adaptive capacity of rural population.

Agriculture and Livestock

25. **Agriculture.** Agriculture remains a key source of income for more than 74% of the population, constitutes 8.3% of GDP (2011 estimate against 41.6% for industry and 50.1% for services), employs

26.5% of the labor force (2009), and accounts for 35.3% of non-oil exports (2010). The share of agriculture in GDP has been declining steadily, from 30% in the early 1990s to 9.4% in 2009. As shown above this has had a dramatic effect on food security and mal-nutrition. Climate change is projected to further negatively impact existing agricultural practices and production. The rural population, particularly women and marginal groups, are most vulnerable to climate change given their economic dependency on agriculture, particularly rain-fed agriculture.

26. Yemen has four main agro-ecological zones: (i) the highland zone (covering 44% of cultivated land and holding 60% of farms); (ii) the eastern plateau (26% of cultivated land and 19% of farms); (iii) the Tihama zone (26% of cultivated land and 11% of farms); and, (iv) the coastal zone (4% of cultivated land and 10% of farms). Arable land is estimated at 1.45 million hectares, while the land under cultivation varies annually due to rainfall fluctuations. About 51% of cultivated land is rain fed, 30% is irrigated using groundwater pumped from wells, 10% is under spate irrigation, 6% is irrigated from dams, and 3% is irrigated by other sources. In 2009, about 94% of arable land was cultivated (1.31 million hectares), of which cereals accounted for 51.8%, fruits and vegetables 13.8%, fodder crops 12.5%, qat 11.7%, other cash crops (coffee, cotton, sesame, tobacco) 6.7% and legumes 3.3%. Grazing land is estimated to extend over 20 million hectares.

27. Agricultural production remains constrained by a weak technological base. The productivity of Yemeni agriculture (particularly crop and livestock sub-sectors) is at least 50% lower than in other Middle Eastern countries with comparable environments[12]. Post-harvest losses due to poor handling, packaging and transport are estimated to affect about 20-30% of crop output. Irrigation systems are inefficient, resulting in significant waste of water, estimated to be in the range of 50% to 65%.

28. **Livestock.** The current livestock population is estimated at 19.9 million (2009 data including: sheep 9.0 million; goats 8.9 million; cattle 1.6 million, and camels 0.4 million) and is predicted to increase by around 3% per year to reach 30 million by 2025.

29. Today, the livestock market in Yemen is completely fragmented with no formal or organized marketing structure. However, livestock is the primary source of income for landless and small farmers. Small farmers own a greater number of animals than larger landowners who typically grow cash crops such as *qat*, vegetables, and fruits. The day-to-day management of the livestock sector is done primarily by women; this includes cutting fodder and hand-feeding cows. Lack of access to vet services, poor breeding practices, poor nutrition, contamination of feed and water, and parasites and disease are so rampant and unchecked that it not only affects livestock but also children and adults who tend to their animals. Livestock tended by the rural population are highly dependent on rainfall for drinking water and fodder growth.

30. Projected climate change impacts such as changing and more unpredictable rainfall patterns, and more prolonged periods of drought, are a genuine risk to the production and survival of livestock. Furthermore unmanaged numbers of livestock cause overexploitation of seasonal vegetation, increasing the risk of climate induced erosion. Traditional coping mechanism of increased herd size to absorb shocks of natural events and disasters may therefore have an adverse effect on herd survival and climate resilience. Area-based livestock management is required to assess the seasonal carrying capacity of larger areas in terms of sustainable use of water and vegetation. Considering their high dependence on livestock, the rural population, and especially women and landless, will be subject to increased vulnerability and shocks from climate change.

31. Yemen is a net importer of meat. In 2009, the country imported meat for a value of YER 36.9 billion while meat exports were valued at a mere YER 0.03 billion, despite having one of the world's premier export markets for livestock next door – Saudi Arabia. With an upgrade of veterinary services, increased productivity and a structured value chain, this sector could contribute even more to the diversification of poor rural households' income and to import substitution at the national level.

[12] A World Bank Country Study: Economic Growth in the Republic of Yemen, World Bank, 2002, p.23.

Water

32. Yemen is one of the most water-scarce countries in the world. The level is less than one tenth of the threshold for water stress, which is defined as 1,700 m³/capita/year. In highland governorates, less than 20% of communities have access to safe drinking water from public water supply projects whilst 60% of settlements rely on unprotected springs and wells and 20% on cisterns, streams and tanks. Total water demand of 3,400 million m³ per year exceeds renewable resources of 2,500 million m³ per year, thus leading to a steady decline in groundwater levels, varying between 1 m/year in the Tuban-Abyan area and 6–8 m/year in the Sana'a basin. The public supply of water, where available, is erratic.

33. Inadequate policies related to water use compound the problem – despite some moves to increase diesel prices, failure to pay the real cost of water encourages profligate use of groundwater depleting the aquifers. Over the past decades, the state's response to this acute water crisis has been inadequate and largely unsuccessful. The exhaustion of groundwater represents the country's major challenge - groundwater tables are declining very rapidly whilst watershed and range degradation upstream provoke soil erosion and reduce groundwater recharge. The exhaustion of strategic groundwater resources will reduce the capacity of rural population to adapt to climate change impacts as extended droughts, which are expected to increase in frequency and duration. There is a serious risk that a combined depletion of groundwater resources, climate change induced changes in rainfall patterns and extended droughts may dry out the chief water resources of the rural population driving up hunger and potentially leading to famine, and increased migration and famine.

Infrastructure

34. Yemen's infrastructure is weak, unreliable and subject to frequent disruptions, often as a result of flooding. The rehabilitation and further development of roads, communication networks, water networks and other infrastructure elements require consideration of both current challenges and projected climatic impacts[13]. Yemen has close to 60 000 km of dirt tracks and trails compared with around 16,800 km of asphalted roads (MoPWH; 2012). Around 20% of settlements in the highland areas have no access roads while around 70% of settlements can be accessed only by uneven dirt roads. As these roads are presently in poor condition due to regular damage by flooding and inadequate maintenance, an alarming share of the rural population is effectively cut off from participation in the market economy and access to vital services, diminishing the quality of life and reinforcing poverty. Lack of road access reduces the capacity of these people to prepare for and cope from natural disasters as people, food and supplies cannot be moved in or out of affected areas easily. The projected increase in the severity and frequency of extreme rainfall events, flash floods and erosion requires strengthening the climate resilience of road design and construction, through especially road alignment selection away from vulnerable slopes and flood-prone areas and incorporating improved drainage and slope stabilization measures. Furthermore options to capitalize on multi-functionality of roads will be taken, incorporating water harvesting and livestock drinking water ponds into road drainage structures or the design of road embankments as flood protection structures.

35. Climate change also necessitates improving water efficiency of irrigation schemes, through rehabilitation of stone terraces as well as improved O&M and efficiency of irrigation schemes. Considering the severe water scarcity, more strategic water resource management and water shed management plans will be required, taking into consideration the environmental and economic cost of water. The GIS-based maps on changing rainfall patterns and water harvesting (including the sensitivity analysis) are basis for such strategic interventions.

36. Only 45% of the population has access to electricity, mainly in urban areas, and supply is unreliable and expensive. Most enterprises rely on generators to avoid losses due to frequent power cuts. Lack of a reliable electricity supply is a major obstacle to enhancing the adaptive capacity of

[13] World Bank (2010). "Making Transport Climate Resilient Country Report: Mozambique"

rural populations. Given that extending the electric grid to the remote rural settlements is prohibitively expensive, renewable energy - solar and wind - offers an opportunity of generating energy at the point of use, contributing to climate change mitigation as well as increased resilience.

Microfinance

37. Microfinance institutions (MFIs) include eleven NGOs/foundations, Al-Amal Microfinance Bank (all of them developed under the umbrella of the Social Fund for Development), Tadhamon Microfinance Unit and Al-Kuraimi Islamic Microfinance Bank. They have an aggregate outreach of over 150,000 clients, a combined loan portfolio of about USD 35 million, and an average loan size of USD 160. In March 2009, Parliament adopted a new microfinance bank law which allows licensed microfinance banks/institutions to collect savings and deposits and use them for lending, and places them under supervision of the Central Bank, to which they have to submit audited financial statements. Concomitantly, the Central Bank has issued a set of prudential rules and regulations for the microfinance industry. Currently only Al-Amal Microfinance Bank and Al-Kuraimi Islamic Microfinance Bank have been licensed by the Central Bank of Yemen while the microfinance activity of Tadhamon has been licensed under the Tadhamon International Islamic Bank.

38. Positive experience has been recorded in both Dhamar and Al-Dhala projects with the implementation of Savings and Credit Associations for women. In projects, governance, outreach, repayments and impact on poor households' livelihoods are impressive. However, the absence of linkages with the formal financial sector (microfinance and/or commercial banks) hampers their long-term development and limits their impact and outreach

B. Rationale

39. **Opportunities for Climate Resilient Rural Development and Poverty Reduction**. Yemen is the poorest country in the Middle East, faced with declining oil revenues, depletion of freshwater resources, and rapid population growth. Yemen is ranked as the 11th most food-insecure country in the world, with one in three Yemenis suffering from acute hunger (IFPRI, 2011). Just over half the rural population (51%) is food-insecure compared to 27% in urban areas (CFSS, 2012). Overall, 13% of children under five years old are acutely malnourished. Chronic malnutrition among children is also deeply worrying with nearly 60% of Yemeni children stunted. Agriculture growth has lagged behind population growth since 2005, and the average productivity in agriculture, fisheries and forestry is low. Close to 50% of rural households have less than one ha of land, and 40% are landless. Combined with large household sizes and limited off-farm opportunities, this results in significant rural poverty in Yemen. It is considered fundamental for Yemen to diversify its economic base, reduce dependence on oil, increase agricultural production and productivity, and invest in sectors with high potential for market growth and job creation to reduce rural poverty and increase food security.

40. However its wide range of development challenges, and the opportunities to address them are further complicated by climate change which threatens to cause increased drought and unpredictable rainfall, flash flooding and soil erosion, and changes to agricultural productivity which will benefit some areas (if sufficient water can be secured) but which will severely damage others. Amongst the major constraints to the growth of sustainable, diversified and resilient rural economies are: (i) scarcity of water and environmental degradation; (ii) projected impacts of climate change; (iii) limited access to appropriate rural financial services; (iv) poor infrastructure and limited access to markets and services, and (v) weak skills and knowledge of rural population and gender inequalities.

41. Previous IFAD funded projects have demonstrated that community-driven, area-based development programmes can successfully address these problems and reduce poverty and food insecurity while empowering remote rural communities and their women members in particular. This model requires addressing a range of development challenges (knowledge and skills, financial services, infrastructure, access to input and output markets, women's empowerment) in parallel through complementary interventions which create a virtuous cycle and a dynamic rural economy. The Rural Growth Programme will scale up, to incremental communities and governorates, the successful

approaches, methodologies, and activities of three projects: (i) Dhamar Participatory Rural Development Project (DPRDP); (ii) Community Based Resources Management Project (CBRIP); and (iii) Al Dhala Community Resources Management Project; (ADCRMP) while placing a greater focus on climate resilience.

Table 2: Dhamar, Al Dhala, and Rural Infrastructure Projects

Project	Dates		Financing (USD)			Cumulative Beneficiaries end-2011	Cost/Ben. (USD)
	Effective	Completion	IFAD	Cofin.	Total		
DPRDP	Jul. 2004	Dec. 2012	21.5	2.1	23.6	351 100	67
CBRIP	Mar. 2007	Mar. 2013	13.0	1.1	14.1	240 700	59
ADCRMP	Feb. 2007	Mar. 2014	14.3	8.5	22.8	361 900	63
			48.8	11.7	60.5	953 700	63

42. These projects are considered to be flagship models for community development. The community organizations they established have given a voice, for the first time, to hundreds of thousands of poor rural women and men, empowering vulnerable groups (particularly the poor and women), helping them to participate in, and gain benefits from, the projects. Their community-led and gender-balanced extension models are recognized as an effective and sustainable mechanism for crop and livestock services. Impact studies indicate that the projects have substantially improving food security and incomes in targeted communities.

43. In Dhamar over 25 000 smallholders have already adopted new technologies, and 20 000 report increased yields; farmers using improved seeds report 33% yield increases, and those using improved beehives report 300-600% yield increases. About 90% of women's savings and credit groups, 70% of infrastructure management groups, and 80% of the 1,500 micro-enterprises promoted are still operating after three years. These microenterprises typically generate profits of USD 10-15 per day for their owners (all of whom are women), making them the main earners in their households. The average hungry period experienced by food insecure households has fallen from 6 months to 2.1 months.

44. In Al Dhala, one of the poorest and most insecure governorates in Yemen, about 5 000 women and men smallholders benefitted from community-led advisory services focusing on improved technologies (crop varieties, protected horticulture, drip irrigation). The project's investments in domestic water supply are estimated to save women from each household about USD 70 and 300 labor-hours p.a. (previously, round trips of 2-5 hours for women to collect water were common). Beneficiary contributions are relatively high, ranging from 30% for productive investments to 60% for domestic water schemes. In 2011, beneficiary contributions actually increased as people feared that the project would be suspended, and they wanted to ensure that investments went ahead quickly. The project has a very positive reputation in the governorate, and this has contributed to improving stability in the area.

45. The CBRIP pioneered a community contracting method for quarternary road development in highland areas. By engaging communities in road design and construction, and building their capacity for maintenance this approach has fostered community ownership, created jobs, and linked remote villages to markets and services. The methodology was so successful that the executing agency (Community Roads Unit, or CRU) was mainstreamed into the Ministry of Public Works and Highways at project mid-term (in 2010), confirming the project's institutional policy impact and sustainability. Road construction is generating average cost savings of USD 290/person/year due to reduced costs of travel and transportation of goods. An impact study of Al-Shahel Road in Hajjah revealed that, within 3 years of construction, ownership of vehicles and appliances increased by 34%, livestock by 93%, and meat and milk production by 117%, while women's time spent collecting water and wood decreased by 30%. Trips from villages to the nearest market town have typically reduced in cost by USD 2.5-5.0 each; the costs of transporting wheat, gas cylinders and water have dropped by 50%.

46. A study by IFPRI in 2012 found that such projects can even address issues of chronic conflict and instability in rural areas: The study revealed that in Dhamar governorate just 3% of communities in the DPRDP programme area were directly affected by conflict in 2011. However 50% were negatively affected by high food prices and 28% by drought. Higher food prices and more frequent and severe drought will be the key channels of climate change impact on the rural poor. It is therefore essential that major efforts are made now to boost climate resilience by increasing and diversifying incomes and improving natural resource management to secure reliable access to water and improve management of soil and land resources.

47. **IFAD's Comparative Advantage**. IFAD's major comparative advantage is that it has already proven the success of area-based community development models in the projects being scaled up. In addition the institutional and human resource capacity created by these projects can be utilized for the implementation of this programme, ensuring a rapid start-up and generation of results from the outset. Finally the positive experiences of these projects ensure a strong support and high level of ownership on the part of both Government and the targeted communities and have raised the interest of development partners to provide significant co-financing.

48. A further comparative advantage is that during the 2011 - 2012 crisis these IFAD-financed projects were able to continue implementation while those financed by other sources were forced to stop. Key factors which enabled them to continue were the confidence and support provided by the communities in which they worked, the flexibility provided by the broad range of activities being implemented, their decentralized nature with relatively independent PMUs and the location of the PMUs in regional cities, away from the main centers of violence and social unrest in the major cities. IFAD's comparative advantage with regard to the RGP is based on the experience gained and lessons learned through these projects.

49. **Added Value of Climate Financing.** Although the previous IFAD projects in Yemen provided opportunities in terms of enhancing agricultural production, strengthening community-based planning and contributing to poverty reduction, the possible impacts of climate change were not explicitly taken into account. However many of the development challenges faced in rural areas have their origin in natural resource management and are complicated by climate change. The vulnerability assessment undertaken for the design of the RGP has, based on a detailed modelling of climate change scenarios at the country level, identified a set of key risks and adaptive measures to guide decision making relevant to programme design and execution. Programme planning and implementation integrate the findings and recommendations of this assessment to ensure that climate change adaptation priorities are mainstreamed and contribute to disaster-risk reduction, set priorities for wise long-term investments and increase the resilience of target communities.

50. **Country Programme, Harmonization and Alignment.** The RGP complements the ongoing country programme, and in particular the value chain oriented EOP, FIP and YIREP - by focusing on ensuring the provision of basic public goods and services currently lacking in rural areas in order to build resilience to climatic, economic, political and other shocks and to create an enabling environment for sustainable economic growth. The programme is consistent with all three strategic objectives of the 2008-2013 COSOP, namely to (i) empower rural communities, (ii) promote sustainable rural financial services and SMEs, and (iii) enhance food security of poor households.

51. The programme is aligned with the priorities of the Transition Plan for Stabilization and Development 2012 – 2014, the Development Plan for Poverty Reduction 2012-2015[14], with the climate change adaptation priorities identified in Yemen's National Adaptation Plan of Action (NAPA)[15], with the National Water Sector Strategy and Investment Program and the transitional MoPIC National Food Security Strategy, as well as with the Joint UN Framework to Support the Transition in Yemen

[14] Priorities of the DPPR 2012 – 2015: (i) stimulating economic growth and reducing unemployment; (ii) strengthening social protection; (iii) accelerating progress on the MDGs; and (iv) enhancing governance.
[15] NAPA priorities include rainwater harvesting, water conservation, awareness raising and improved land management amongst its priority adaptation activities.

which aims to provide an immediate, concerted and multi-dimensional response consistent with and complementary to existing humanitarian and development plans. Importantly it responds directly to the GCC Agreement's call for '*establishing and implementing an initial programme of economic stabilization and development and addressing the immediate needs of the population in all regions of Yemen*'. Support for community-level institutions will ensure that they are effectively integrated within existing district and governorate administrative structures for sustainability and impact.

III. Programme description

A. Programme Goal and Development Objective

52. The programme's goal is to reduce poverty and food insecurity in rural areas and increase smallholder climate resilience. Its development objective is to stimulate sustainable and resilient economic growth for women and men in rural communities.

53. The programme's expected outcomes are: (i) household and community empowered to manage own development and engage in income generating activities; (ii) natural resource management improved and focusing on climate resilience, and (iii) improved climate-resilient agricultural practices and technologies adopted.

B. Programme Area and Target Group

54. **Programme area**. The programme will scale up successful activities implemented under the DPRDP and DCRMP within Dhamar and Al-Dhala governorates to reach additional communities, and expand to Hodeida, Lahej and Taiz governorates while strengthening their climate resilience. These five governorates have relatively high population density, substantial rural poverty, and serious food insecurity and all have large areas identified as hotspots of climate change vulnerability. The programme will expand into additional governorates as additional financing becomes available.

55. **Target group.** The programme's target group will consist of poor food insecure rural households living in selected communities with a specific focus on women and youth[16]. However, other households will also benefit from the programmes investments in public goods and civil works such as roads and community schemes for drinking water. Transparent targeting procedures, based on mechanisms applied by ongoing projects will be implemented including geographic and direct targeting and enabling measures. Efforts will be made to ensure the involvement of women in decision-making and leadership positions in community organizations. At full development, the programme is expected to directly benefit around 1.2 million individuals, of whom around 0.8 million live below the poverty line (table 2).

Table 3: Target population and expected beneficiaries

Governorates	Total Rural Population		Poor Rural Population		Previous progr. cumul. Individuals	Remaining poor rural population	Targeted Beneficiaries			
	HHs	Individuals	% of poor	Individuals			VUs	HHs	Individuals	Poor Ind.
Al Dhala	67.113	531.463	56,3	299.214	144.760	154.454	80	25.600	202.726	144.543
Dhamar	205.980	1.489.233	34,6	515.275	121.481	393.794	80	25.600	185.088	91.804
Hodeida	307.891	1.817.668	49,0	890.657		890.657	130	41.600	245.591	157.178
Lahej	128.344	859.904	61,6	529.701		529.701	130	41.600	278.720	213.500
Taiz	372.356	2.417.637	61,9	1.496.517		1.496.517	130	41.600	270.101	207.708
Total	**1.081.682**	**7.115.905**	**52,4**	**3.731.364**	**266.241**	**3.465.123**	**550**	**176.000**	**1.182.225**	**814.732**

Source: Central Statistic Organization (2004) updated by a coefficient of 3.2 per year.

[16] The national poverty line will be used as the definition of poor.

56. **Village Unit formation process**. To maximize the impact of programme activities and avoid geographically scattered interventions, the programme's intervention unit will be the 'Village Unit' (VU) averagely composed of 3 to 5 settlements, each having an average of 75 to 100 households (i.e. approximately 600 inhabitants per settlement). A total of 550 Village Units will be established over years 1 to 3 in the most vulnerable districts of the five selected governorates. The selection. VUs will be conducted on the basis of the latest poverty assessment and the climate vulnerability assessment undertaken during project design. The VU selection process will give emphasis to remote, mountainous areas within each district where living conditions are significantly more difficult and poverty most acute. The vulnerability assessment will identify those VUs: (i) most suitable for stone terrace rehabilitation; (ii) most vulnerable to soil erosion; (iii) most vulnerable to flood risks; and (iv) most vulnerable to changed cropping potential. This ensures that project activities address the most pressing needs of selected VUs. Agreements will be required from communities: (i) not to utilize programme support for existing *qat* farms or to increase the area under *qat* cultivation, and (ii) to establish, as required specific user groups to manage all programme constructed infrastructure and the land and water resources utilized by the VU.

57. **Phasing of activities**. Activities related to community empowerment, drinking water and agriculture development will commence in Year 1 in all selected governorates while activities related to natural resources management and infrastructure will be implemented starting from Year 1 in Al Dhala and Dhamar governorates and from Year 2 in Hodeida, Lahej, Taiz governorates as they require higher CDA capacity. PMUs will be operational in each governorate at programme inception with Village Units selected during the first three months of the programme. In Al-Dhala and Dhamar governorates all selected VUs will be reached within 2 years while for Hodeida, Lahej and Taiz governorates, the outreach to selected VUs will be made over a period of 3 years.

C. Components

58. The programme consists of three complementary and mutually reinforcing technical components in addition to the programme management component. These are: (i) community empowerment and livelihoods diversification; (ii) natural resources management and resilient infrastructure; and (iii) agriculture development. Within these three components, the specific range of activities to be implemented in each Governorate will depend upon the specific socio-economic context, agro-ecological conditions and community demand, as captured in Community Action Plans.

Component 1: Community Empowerment and Livelihoods Diversification

[Total base costs: USD 28.2 million or 23.5% of total base costs]

59. The expected outcome of this component is: households and communities empowered to manage their own development and engage in income generating activities. Investment under this component includes: (i) community institutions building; (ii) women's empowerment; (iii) microfinance, and (iv) income generating activities.

60. **Sub-component 1.1: Community Institutions Building**. The programme will support the establishment/strengthening of Community Development Associations (CDAs) and CDA registration under the Ministry of Social Affairs and Labor. Registration will provide the legal and regulatory framework for CDA operations as well as for the use of community contracting. The programme will train all members of each CDA executive committee in organization and management, accounting, bookkeeping and conflict resolution, enabling them to manage implementation of development activities and to train office bearers of specific sub-groups such as water users associations. Each community will be assisted to undertake a participatory diagnosis of their development issues and constraints. Investments and activities to overcome these constraints will be identified through a participatory process and incorporated in Community Action Plans (CAPs). Volunteers within each community will be trained to assist in this process. A particular focus of this training will be on environmental sustainability, climate change adaptation and disaster risk management to ensure CAPs include climate risk management measures.

61. **Sub-component 1.2: Women's Empowerment**. The programme will support the provision of literacy and life-skills training to ensure that women are fully involved as partners in development. This includes issues such as healthcare, nutrition, legal rights, and the environment. A particular focus will be placed on training of trainers within each community to enable women trained to share their skills with others.

62. **Sub-component 1.3: Microfinance**. Building on the successful implementation of Savings and Credit Groups and Associations (SCGs and SCAs) under DPRDP and ADCMRP, SCGs will be created in each selected VU and SCAs at governorate level, linked to a partnering microfinance institution. Each PMU together with the microfinance institution will assist communities with the creation and registration of their SCGs and SCAs (awareness campaign, assistance to formation and legal registration, and assistance with the election of members of SCAs governing bodies), elaboration of their manual of procedures, training and capacity building, access to loans from partnering MFI, and advisory services.

63. **Sub-component 1.4: Livelihoods Diversification.** The main objective of this sub-component is to promote youth and women-managed farm and off-farm micro and small enterprises/income generating activities in an effort to enhance their adaptive capacities and resilience. Specific business opportunity analyses will be carried out to identify opportunities that have comparative advantage, growth potential and market demand. Based on this the main forms of support will include the provision of technical and management training, matching grants, and market access support. Renewable energy grants will also be available for the development of small and micro-enterprises located in village not connected to the national grid which will further enhance climate resilience as well and contribute to climate change mitigation.

Component 2: Natural Resources Management and Resilient Infrastructure

[Total base costs: USD 45.9 million or 38.3% of total base costs]

64. The expected outcome of this component is: Improved natural resource management focusing on climate resilience. Investments supported under this component will focus on: (i) integrated water management and soil conservation; (ii) rangeland rehabilitation, (iii) drinking water; and (iv) quarternary roads.

65. **Sub-component 2.1: Integrated Water Management and Soil Conservation**. The objective of this sub-component is to support off-farm agricultural production in selected VUs through land conservation works and enhanced efficiency in water harvesting such as restoring agricultural land, its productivity and fertility. Programme interventions will take into consideration principles and approaches of integrated watershed management within the VU catchments. Interventions will be based on the vulnerability assessment, extent of resource degradation, feasibility, potential benefits and minimal risks of damage and conflict to other communities within the watershed and will be guided by the studies already undertaken on the vulnerability of VU sites based on present and future climate change risk scenarios[17]. Investments considered will consist of medium and small surface water harvesting measures and spate irrigation infrastructures for direct irrigation, reservoirs and conveyance network up to field edge aiming at enhancing crop production and increasing climate resilience of crops during droughts. Emphasis is also given to reducing water losses in irrigation schemes and enhancing efficiency. Investments in small and medium dams to increase local capacity to capture and store water, in rehabilitation of existing water harvesting infrastructures and in the promotion of modern adapted irrigation systems (see also sub-component 3.2), will always be linked with the promotion of water-saving modern irrigation systems.

66. Further activities will include rehabilitation of terraces, wadi bank protection and reforestation activities to increase slope stability and reduce soil erosion. The soil protected by rock terraces will act

[17] Mapping climate change impacts on smallholder agriculture in Yemen using GIS modelling approaches - IFAD - January 2013

as a natural water storage that will retain soil moisture adequate for rainfed agriculture. They will also attenuate flash floods impact in lower areas. In combination with terrace rehabilitation, the programme will promote reforestation activities of hillsides.

67. **Sub-component 2.2: Rangeland Rehabilitation**. The objective of this sub-component is to increase the open range land productivity for improving the land carrying capacity and enhance vegetation cover growth. Based on CAPs and on a preliminary study carried out by the Department of Forestry and Rangelands assessing the status of rangelands in terms of carrying capacity, biodiversity, water resources and soil erosion situation, project investments will include micro-catchment water harvesting, reseeding of indigenous herbaceous leguminous and cereal species, and woody perennial forage crops as well as soil conservation and stock water provision. Since this sub-component is a community-managed pilot area, capacity building to local communities will be provided by the programme. Rehabilitated rangelands will be managed through rotational exclusion for 1-2 years to allow for the improvement of the carrying capacity of the land and sustainable resource management. Management plans will be developed by the relevant CDA and Rangeland Management Associations (RMAs), to be established by community facilitators and trained by the NPCU Environment and Climate Change Specialist as well as by the Department of Forestry and Rangelands.

68. **Sub-component 2.3: Drinking water**. The programme will support both individual household investments (roof rainwater harvesting structures) and community drinking water schemes based on sustainable use of locally available resources and climatic conditions (protected shallow wells, boreholes, and gravity-fed springs) to provide communities with reliable and safe access to drinking water during the dry season and reduce the workload of women and girls who can spend hours every day collecting water. For community schemes, water user associations (WUAs) will be established to manage and maintain community systems.

69. **Sub-component 2.4: Construction/Rehabilitation of Quaternary Roads**. The objective of this sub-component is to create resilient rural road infrastructure to provide improved and reliable access to markets and services. The programme will upgrade existing earth/gravel quaternary roads or tracks which have not already been upgraded by the CBRIP through: (i) climate resilient design and construction with improved surfaces and erosion protection works; (ii) local climate resilience measures like water harvesting and livestock drinking water; and (iii) building community capacity in road management and maintenance. Roads will be upgraded to at least one lane roads with passing places providing for year-round access with traffic volumes averaging 10-20 vehicles/day and an average travel speed of 10 km/h. The programme will assist communities to form Road Maintenance Groups (RMG) under the supervision and monitoring of the Community Development Association.

Component 3: Agriculture Development

[Total base costs: USD 35.5 million or 29.5% of total base costs]

70. The expected outcome of this component is: Improved climate resilient agricultural practices and technologies adopted. Investments under this component include: (i) extension support and inputs provision; (ii) irrigation efficiency; (iii) agriculture production and diversification, and (iv) applied research for vulnerability reduction.

71. **Sub-component 3.1: Extension Support and Inputs Provision**. The objective of this sub-component is to train Village Agriculture Technicians (VATs) as local, private extension agents - covering both agriculture and livestock. In each selected village unit, the programme will train 8 farmers of whom 2 will form a team of VATs - one man and one woman – on good agricultural production (including sustainable soil and soil fertility management, enhanced irrigation practices and technologies, greenhouses production, pest management and postharvest loss reduction) and animal husbandry practices (health treatment, disease prevention, detection and reporting, improved housing, enhanced livestock feed regimes, improved flock management practices). The programme will also finance basic equipment and a small supply of livestock drugs to kick-start their activities.

Care will be taken that environmental sustainability and projected climate change impacts are fully integrated in the VAT's training and in extension services. The programme will ensure liaison between VATs, the Agriculture Research Extension Authority (AREA), international research institutes and MoAI for agriculture and with the Directorate General of Animal Resources and the Central Veterinary Laboratory for livestock.

72. The programme will support the establishment of a small local input supply shop in each village unit managed by one trained VAT, identified by the CDAs. The shop will facilitate access of farmers to equipment (irrigation, sprayers and related protection material), enhanced post-harvest handling material (drying, packing, and storage material and equipment), seeds of local or climate adapted varieties and other agricultural inputs. The programme will also address present constraints in livestock production through interventions in veterinary support and enhanced animal feeding. Financing of the VATs-owned inputs supply stores will be through VATs' contributions, a matching grant from the programme and a loan from a commercial bank partnering the programme.

73. **Sub-component 3.2: On-Farm Irrigation Efficiency**. This sub-component aims at improving irrigation water use efficiency through dissemination and promotion of proven technological packages that depends on water saving and on-farm environmental modification and control measures. Modern irrigation systems will be promoted by the programme in each VU where water harvesting structures have been implemented or rehabilitated under the programme, so as to extend the benefit of community water management to each individual. In addition, in all 5 programme governorates, the programme will also promote modern irrigation systems independently from programme-supported water harvesting investments, especially in water-scarcity areas.

74. **Sub-component 3.3: Agriculture Production and Diversification**. Diversification of agricultural production for enhanced resilience will be promoted in various ways. The programme will promote protected vegetable production by piloting the use of low-cost greenhouses and simple tunnel net-shade low systems with up to five greenhouse units introduced per village and to be operated by group of ten small famers. Prior to implementing VATs will ensure the existence of market opportunities for greenhouse vegetable production. The Programme will assist greenhouse beneficiaries to liaise with nurseries, research institute, and other programmes promoting similar investments.

75. Under this sub-component, the programme enhance crop-livestock integration through demonstrations of irrigated or rainfed sorghum-clitoria fodder production systems that aims at improving source and quality of animal feed and the restore soil fertility through crop rotation and will implement demonstrations of climate change resilient crops/species, cropping practices (including conservation agriculture) or technologies to encourage farmer adoption. Yield increase, moisture retention, rain-fed water use efficiency, labor-time and inputs saving, as well as environmental benefits, will be assessed. Intercropping as well as relay planting will be demonstrated as another potential practice to optimize water use, enhance soil fertility and diversify income.

76. **Sub-component 3.4: Applied Research for Vulnerability Reduction** . Through this sub-component, support will be provided to AREA, who will conduct trials in each governorate based on their agro-ecological conditions and projected impacts of climate change on local agriculture. Support to research will be for the identification of crop alternatives at both the varietal and species level, post-harvest loss management, development of alternative crops in qat production areas, development of non-conventional water resources for agricultural production, promotion of doum plantations and testing date palm under saline conditions, improved farming practices for increased climate resilience including sustainable soil management and genetic improvement of climate-change resilient/tolerant varieties. AREA will also ensure knowledge sharing with VATs and MoIA staff through the production of leaflets and organization of annual one-day workshops.

Component 4: Programme Management and Coordination.

[Total base costs: USD 10.4 million or 9% of total base costs]

77. The programme will be managed by Governorate-level PMUs, with a national Programme Coordination Unit located in Sana'a. The programme management activities will include recruitment and training of staff, establishment, equipment of offices and purchase of vehicles and provision of the needed institutional support and technical assistance. The structure and responsibilities of the PMUs and PCU are described in detailed in section IV below.

Innovative Features

78. The programme innovative feature rests on its intention to scaling up proven successful approaches and activities and its focus on climate resilience. .

- **Scaling-up**. The programme will scale-up proven approaches and modalities for community-driven, area based development in insecure and conflict affected environments from three IFAD-financed projects into a single national programme, initially targeting five Governorates but with the possibility to expand further if additional financing is mobilized. The design incorporates lessons learned from project implementation during the 2011-2012 crisis regarding resilience to conflict.
- **Climate resilience**. The programme is built around vulnerability reduction and will adopt several approaches to address the issues related to climate changes and its impact on the rural economy. These approaches include: (i) provision of financial services and promotion of income generating activities to support the implementation of the disaster-risk community action plans; (ii) promotion of climate resilient agricultural approaches and technologies, including sustainable agricultural practices and research for the promotion of drought/heat tolerant crops; (iii) construction/rehabilitation of resilient water infrastructure enabling improved water management for both drinking water and irrigation, and (iv) restoration of natural resources and assistance to improve communities' management of natural assets.

D. Lessons learned

79. The operational experiences of Government and financiers, including IFAD, in Yemen have generated lessons which have been considered in the programme design and execution. The key lessons of relevance considered in this design include: (i) community leadership in planning and implementing development projects from the outset is essential for their success, future ownership and sustainability; (ii) positive impacts of investments in domestic water supply on women's empowerment are multiplied when combined with literacy, life-skills and vocational training, and saving and credit group formation; (iii) construction of access roads is essential to facilitate and encourage investment in rural areas and can have a transformative effect on rural communities, particularly for women; (iv) access to appropriate financial services by rural poor is essential for adoption of improved technologies and establishment of micro-businesses and fundamental for economic growth and poverty reduction; (v) quality and motivation of programme management and staff are key factors in programme performance; (vi) rigorous ex-ante assessment of the potential environmental and social impacts of activities and the development of appropriate plans and measures to mitigate their risks are essential elements for the programme sustainability.

80. Particular areas in which the design of the RGP will aim to improve on the performance of the DPRDP, CBRIP and ADCRMP are: (i) increasing focus on economic infrastructure, aiming at improving water management and soil conservation (water harvesting structures and water storage facilities, spate irrigation schemes, wadi bank protection, terrace rehabilitation) associated with promotion of modern irrigation schemes to improve on-farm water use efficiency; (ii) developing appropriate partnerships to support social infrastructure in targeted communities; (iii) ensuring financial linkages between SCGs and MFBIs; (iv) promoting climate-change resilience at all level of the programme; (v) reducing cost of infrastructure works through increased use of local materials and

community labor; (vi) standardizing approaches to cost-recovery across all programmes for maintenance of infrastructure; (vii) strengthening M&E frameworks and impact measurement; (viii) strengthening linkages between CDAs and local administration through legal registration and integration in governorate-level development plans; and (ix) close collaboration and linkages between PMUs and the existing decentralized Government system.

IV. Programme Implementation

A. Organizational Framework

Governance

81. The programme's governance will be threefold: (i) District Coordination Groups (ii) Governorate Steering Committees; and (iii) a National Steering Committee.

82. **District Coordination Groups (DCG)**. They are located in each district selected under the programme and headed by the General Secretary of the District Council. The main responsibilities of each District Coordination Group will include: review of CAPs, coordination between stakeholders and local partners; and conflict resolution.

83. **Governorate Steering Committees (GSC)**. They will be established in each governorate and chaired by the Governor. The main responsibilities of each GSC will include: approval of Governorate Annual Work Plan and Budget, coordination between all stakeholders, coordination with Governorate development plans; review progress reports and performance of programme's activities; resolve any implementation issues and provide guidance to PMUs.

84. **National Steering Committee (NSC)**. This will be established in Sana'a and chaired by the Minister of Agriculture and Irrigation. Its major role will be to: provide strategic and policy guidance for programme implementation, approve the overall AWPB, recruit the audit firm and approve its report, review recruitment process and endorse the selection of PMU Managers and key staff, review progress reports and performance, and resolve implementation problems not resolved at lower levels.

Management

85. In line with the community-driven development approach, CDAs at Village Unit level will be considered the first level of programme planning and implementation. At each governorate level, the coordination of programme planning and implementation will be the responsibility of the Programme Management Unit (PMU) reporting to a Governorate Steering Committee (GSC). Overall coordination at national level and support for cross-cutting issues will be provided by a National Programme Coordination Unit (NPCU) located in Sana'a and reporting to a National Steering Committee..

86. **Programme Management Units**. Community mobilization will mainly be implemented by the PMUs while the majority of programme investments and activities will be implemented through partnerships with the relevant line Ministries, externally-financed programmes and the private sector (incl. NGOs), based on the model established by the ADCRMP and DPRDP. PMUs main role will be in procurement and supervision of service providers, contract management, and mobilizing and managing relationships with target communities. Partner and service provider performance will be subject to strict performance management and evaluation. PMUs will coordinate closely with the Governorate, District and Uzla administration to ensure that planning at VU-level feeds into District and Governorate development plans. In addition, each PMU will play an active role in the capacity building of the local administration. All staff members will be recruited on a competitive basis in compliance with IFAD's procurement guidelines. All staff contracts will be for an initial probationary period of six months compliant with Yemeni labor law, with the possibility of extension subject to satisfactory performance.

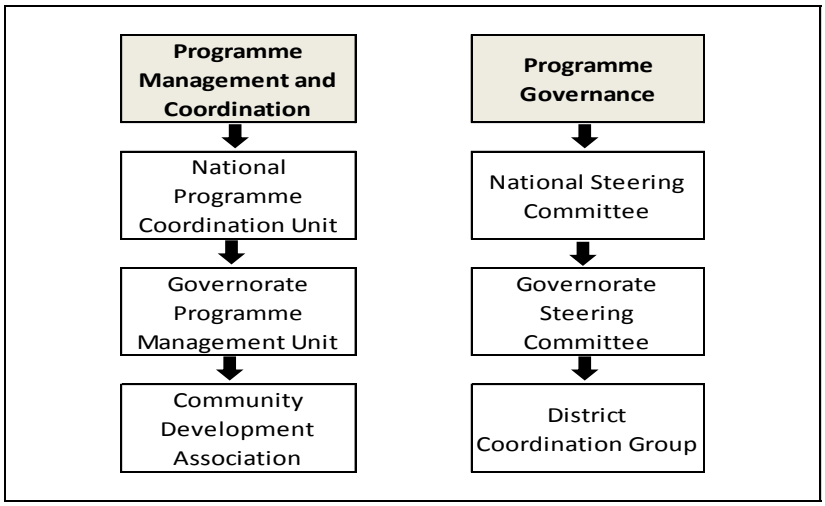
87. To ensure sustainability and ownership by the local population and continuity of activities after its completion, the RGP will ensure that PMUs are gradually integrated within the Governorate

administrative structure. The RGP Mid-term review will assess feasible options for this integration, based on outcomes of the ongoing National Dialogue and transition process and its impact on the decentralization process.

88. Each PMU will be headed by a Programme Manager (PM) with expertise in agriculture/rural development and staffed with a small team of professionals: (i) an accountant; (ii) a procurement officer; (iii) an M&E officer; (iv) a rural engineer, and (v) a gender and community development officer.

89. **National Programme Coordination Unit**. A National Programme Coordination Unit (NPCU) will be established in Sana'a, hosted by the AFPPF but reporting to the MAI. This NPCU will provide PMUs with services related to cross-cutting and cross-governorate issues. Its staff will be competitively recruited. The NPCU will include the following positions: (i) Programme Director; (ii) Finance Manager; (iii) Internal Auditor; (iv) 2 Consolidation accountants; (v) Senior M&E and KM specialist; (vi) Senior Procurement Officer; (vii) Environment and Climate-Change Specialist; (viii) Business Management/Rural Finance specialist, and (ix) Secretary.

Figure 1: Programme Management, Coordination and Governance



Implementation Arrangements, Responsibilities and Partnerships

90. The implementation arrangements, responsibilities and partnerships[18] are outlined below by component and activity:

Component 1. Community Empowerment and Livelihoods Diversification:

- **Sub-component 1.1: Community Institutions Building**. Two Field Managers (FMs) (one man and one woman) will be recruited by each PMU to supervise CFs teams, also each one man and one woman. In selected VUs, based on the same ADCRMP and DPRDP model, CFs and FMs will mobilize communities, assist them with registration of CDAs, build capacity of CDAs' members and provide support to CDAs to develop their CAPs, integrating climate risks and incorporate specific adaptation measures. Support to each VU will last 36 months.
- **Sub-component 1.2: Women's Empowerment**. Training and training of trainers will be implemented by appropriate service providers selected through a competitive process (the Government's Adult Literacy Organization, NGOs, training centers). Where feasible a single service provider will be selected in each Governorate for each type of training to be delivered.
- **Sub-component 1.3: Microfinance**. CFs will assist communities to create SCGs in each VU, based on the model developed by the ADCRMP and DPRDP, with seed capital from the

[18] To be identified as Project Parties in the Financing Agreement. These include the Public Works Project, the Community Roads Unit, the Agricultural Research and Extension Authority, the Adult Literacy Organisation, the Small and Medium Enterprises Promotion Service, the Economic Opportunities Fund, the Social Fund for Development, and the National Irrigation Programme.

programme matching member contributions. Capacity building and technical assistance will be provided to SCGs by an expert contracted by the NPCU. PMUs will facilitate the linkage between SCGs and a licensed microfinance institution selected through a call for expression of interest. PMUs and the MFI will assist SCGs to create SCAs that will provide capacity building and advisory services to their SCGs members.

- **Sub-component 1.4: Income Generating Activities**. Competitively-selected consulting firms, NGOs and training centers will undertake market research and provide technical and management training and coaching to groups of micro-entrepreneurs, mainly youth and women. Matching grants will be approved by the NPCU-based Investment Committees. Additional support will include a renewable energy grant for eligible micro and small-enterprises covering 100% of necessary equipment and technical assistance as well as market promotion activities.

Component 2. Natural Resource Management and Resilient Infrastructure:

- **Sub-component 2.1: Integrated Water Management and Soil Conservation**. The NPCU will contract the PWP to prepare tender documents, launch tenders, select local contractors, and supervise implementation and authorize payments. Specialized consulting firms/NGOs will be contracted to support the establishment and capacity building of WUAs. These will be assisted by the PMU Gender and Community Development Specialist and CFs. Contractors will provide training on management and maintenance of infrastructure and machinery. Additional partners will include local contractors, under the supervision of the NPCU Environment and Climate Change Specialist and VATs. Training will be provided for Land Users Associations by AREA, the Governorate Agriculture and Irrigation Offices and selected contractors.
- **Sub-component 2.2: Rangeland Conservation**. This sub-component will be implemented jointly by the DFR and the CDA. The PMU will subcontract DFR to undertake the initial rangeland assessment while providing technical assistance and capacity building. DFR will support CDAs to prepare rangeland management plans, and to implement and monitor. The PMU Gender and Community Development Specialist and CFs will assist communities to create Rangeland Management Associations (RMAs) and provide them with training to ensure proper management and protection of rehabilitated rangelands.
- **Sub-component 2.3: Drinking water**. Design (including water availability projections) and estimates of investment and operating costs will be prepared by contracted engineers/firms. Household systems (roof-harvesting structures) will be constructed by local contractors contracted by the PMUs through competitive bidding. Community drinking water systems will be implemented by the Public Works Programme (PWP), and/or competitively selected local contractors. CFs will support the establishment and capacity building of WUAs with the assistance of specialized service providers. PWP and local contractors will provide training on management/maintenance of infrastructure and machinery.
- **Sub-component 2.4: Construction/Rehabilitation of Quarternary Roads**. PMU Rural Engineers will carry out the design of the CAPs selected road rehabilitation and construction works, inclusive of specific climate-resilience measures. The road works will be implemented by competitively selected service providers. A service provider will be competitively recruited to preparing tender documents, launching tenders, selecting the contractors, supervising implementation and authorizing payments. The PMU Gender and Community Development Specialist, Field Teams and PMU/Rural Engineer will support the establishment and capacity building of Road Management Groups within CDAs, with assistance from the service providers and contractors.

Component 3. Agriculture Development:

- **Sub-component 3.1: Extension Services and Inputs Provision**. Selection of individuals to be trained as VATs will be done by CDAs. Training of VATs will be designed and provided by the Agricultural Research Extension Authority (AREA), governorate Agricultural Office staff, and universities subcontracted by the NPCU. The Programme will also liaise with the AREA to

identify areas of possible improvement and innovation, new varieties, inputs and production and postharvest material and equipment to be promoted. From programme year 2, at least one VAT per village unit will be selected to be the owner of an input supply store financed through VAT's contribution, programme grant and debt financing from a partner microfinance institution. The programme will assist VAT's store owners with management training courses.

- **Sub-component 3.2: Irrigation Efficiency**. Concomitantly to the construction/rehabilitation of water harvesting structures, PMUs will procure the necessary modern irrigation system for on-farm implementation. In addition, based on CAPs, VUs will be selected for the implementation of modern irrigation schemes independently from water harvesting investments, using poverty level, agriculture potential and diversity, as well as proportion of smallholders willing to adopt modern irrigation schemes indicators. Specialized training on the use of modern efficient technologies such as GR drip irrigation and bubblers will be provided by VATs assisted by representatives from the MoIA National Irrigation Programme and the Governorate Agriculture and Irrigation Offices.
- **Sub-component 3.3: Agriculture Production and Diversification**. This sub-component will be implemented by VATs trained by AREA. CDAs will identify potential beneficiaries for greenhouses on the basis on their experience, their skills, the availability of land and their willingness to finance and manage a greenhouse. FMs and CFs supported by PMUs Gender and Community Development Specialist and the NPCU Environment and Climate Change specialist will select VUs in each governorate willing to pilot demonstration plots so as to introduce new climate change resilient crops/species, technologies and best practices. Demonstrations will be piloted by VATs with the support of AREA. Through advisory services, VATs will also encourage farmers to adopt demonstrated climate-change resilient crops/species, and technologies.
- **Sub-component 3.4: Applied Research for Vulnerability Reduction** This sub-component will be implemented by AREA with the support of MoAI Agriculture and Irrigation Offices. Trials will be implemented in each governorate based on their agro-ecological conditions and the vulnerability map. In addition, one fully equipped greenhouses (including solar panels and drip irrigation) will be allocated to each AREA center (4 governorate as Al-Dhala governorate is covered by Dhamar AREA center) to develop and promote adapted technological packages for production under greenhouses.

Partnerships.

91. Financial and technical partnerships will be developed under the Rural Growth programme. (i) ***Financial partnerships*** will include in the five governorates: Islamic Development Bank which will exclusively finance (a) water harvesting structures and (b) community drinking water schemes based on boreholes; European Union which will finance (a) individual drinking water schemes, (b) wadi bank protection, and (c) roads; GEF which will mainly finance (a) research and development on alternative and potential climate resilient crops, (b) rangeland improvement, (c) training of users' groups, and (d) women's empowerment activities through literacy and life-skills training courses; ASAP which will mainly finance (a) community institutional building activities, (b) access to market, and (c) village agriculture technicians; Agriculture and Fisheries Production Promotion Fund which will mainly finance (a) productive assets such as modern irrigation on field, greenhouses , and (b) activities to increase/preserve production area, terraces rehabilitation and wadi bank protection; Microfinance Institutions which will mainly finance income generating activities, and will extend refinancing loans to savings and credits groups/associations. The IFAD/co-financiers ratio (excluding beneficiaries and government) is 1:5.48 (USD 15 million having mobilized USD 82 million from the above-mentioned co-financiers). (ii) ***Technical partnerships*** will include several public and private institutions such as: the Adult Literacy Organization and other specialized NGOs (yet to be determined) for women's empowerment activities; the World Bank-supported Public Work Programme which will implement activities related to drinking and irrigation water; the Agriculture Research Extension Authority and Range Forestry department for soil conservation activities, training of village agriculture technicians

and research and development of alternative and new climate resilient crops; Small and Medium Enterprises Promotion Services, USAID and UNDP for agriculture production diversification and notably linkages with greenhouses producers, nurseries, and training of programme-supported greenhouses beneficiaries, as well as GIZ for the development of adequate financial products for agriculture.

B. Planning, Monitoring and Evaluation, Learning and Knowledge Management

92. Planning will be based on CAPs. CAPs will be prepared for a period of 3 years allowing medium term planning to simplify the process of annual AWPB preparation and approval. Activities incorporated in CAPs will be aggregated and organized by component and activity and grouped for ease of procurement. This will form the basis for each governorate annual work plan and budget (AWPB). AWPBs will be finalized by each PMU through a participatory approach with stakeholders, incorporating also data from its M&E system, regular participatory CAP reviews and recommendations of supervision missions and Steering Committees. Governorate AWPBs will be approved by the Governorate Steering Committee (GSC) before being consolidated by the NPCU. The consolidated national AWPB will be submitted to the National Steering Committee for approval, and then to Government, IFAD and co-financiers for concurrence.

Monitoring and Evaluation

93. The programme M&E system will be designed to offer comprehensive and reliable information to improve planning and decision-making for results-based management. Considering the extent to which impact depends on improved and competitive value chains, and beneficiary investment and marketing decisions, the system will be participatory and decentralized, actively involving target groups and service providers, and RIMS-compliant. The logical framework will constitute the basis for results-based M&E. The M&E system will have a three-tier structure: (i) output monitoring with focus on physical and financial inputs, activities and outputs; (ii) outcome monitoring assessing the use of outputs and measure benefits at beneficiary and community levels; (iii) impact assessment assessing programme impact for the target group in comparison with objectives. All M&E data, analysis, and reporting will be disaggregated by gender. All M&E activities will be based on IFAD's Guide for Programme M&E.

94. The overall responsibility for M&E activities will rest with the NPCU Senior M&E Specialist and PMUs M&E officers. The NPCU Senior M&E Specialist will report to the NPCU Director while PMUs M&E officers will report to PMUs Manager. NPCU Senior M&E Specialist will supervise PMUs M&E officers. NPCU and PMUs M&E Senior specialist/officers will establish a data collection, analysis and reporting system to track physical and financial performance and emerging impact.

95. The programme's logical framework will be reviewed and M&E indicators defined at a Start-up Workshop. At the beginning of implementation a Baseline Survey will be conducted by each PMU in selected locations to assess the physical and socio-economic status of the village-units and related households and to define their benchmark status. The survey will be undertaken by a contracted service provider and will focus on collecting data related to the selected M&E indicators.

96. ***Reporting***. Harmonized programme progress reports will be produced quarterly, semi-annually, and annually. Reporting progress will be made available for each governorate as well as consolidated for the programme area.

97. Two Mid-Term Reviews will be undertaken in PY3 and PY5 covering: (i) physical and financial progress in comparison with AWPBs; (ii) performance assessment of service providers; (iii) institutional and national policy changes arising from programme activities; (iv) opportunities for deeper integration of implementation within national systems; and (v) overall progress towards the achievement of programme objectives. At the end of the programme, a Programme Completion Report will be prepared by Government, with IFAD support, to examine the overall programme performance, taking into account a broader and longer-term perspective.

98. The programme will use locally adapted RIMS surveys at baseline, mid-term and completion as the main quantitative survey tools. Ad hoc surveys, qualitative case studies and thematic reviews will be outsourced to independent institutions to verify results and draw lessons on themes such as climate resilience and adaptation, market access, community empowerment, infrastructure development and food security improvement. The operation and impact of Community Action Plans will be specifically studied.

Learning and Knowledge Management

99. Operational experiences will create valuable knowledge in these areas, which will be captured by the NPCU/PMUs and utilized to generate lessons and best practices to be shared with public institutions, the IFAD country team, partners and others. The results of programme support for developing sustainable community-based development institutions and infrastructure as well as sustainably expanding microfinance operations in rural areas will be widely publicized. Partnerships with IDB, WB and EU operations will be intensified in this respect.

100. The programme will promote: (i) in-country knowledge networking through periodic seminars/workshops; (ii) regional knowledge networking such as Karianet, and (iii) regional research networks including those supported by IFAD grants. The IFAD country team will contribute to in-house knowledge sharing and networking. Special emphasis will be placed on knowledge regarding climate change adaptation and disaster-risk development planning. The vulnerability assessment undertaken by IFAD will be the basis for that, ensuring it guides adaptive long-term planning regarding development work in Yemen. Main anchoring points for knowledge management will be identified, including research institutions, civil society, regional KM networks and specialised service providers.

C. Financial Management, Procurement and Governance

Financial Management and Disbursement[19]

101. **Budgeting**. The programme will receive funding from 5 external sources - IFAD grant, GEF grant; ASAP grant; EU grant: Islamic Development Bank loan. The AWPB will indicate the sources of funds separately and indicate anticipated funding requirements on a quarterly basis. The AWPB will also include cash forecasts on a quarterly basis. To mitigate the risk of delays in provision of counterpart funds Government will place counterpart funds in a separate account at the beginning of each programme year.

102. **Funds Flow and Disbursement Arrangements**. The Programme will use the imprest fund method for the Designated Account advances. The modalities, with respect to imprest fund will be detailed in the Letter to the Borrower (LTB). Advances to the Designated Account (DA), for the Loans and Grants, will be transferred to separate accounts held in USD and EUR at the Central Bank of Yemen (CBY). The diagram in Annex 1 of Appendix 7 details the flow of funds. The NPCU and each Governorate PMU will open operational accounts in Yemini Rials at CAC Bank or another commercial bank acceptable to IFAD. On the basis of the approved AWPBs, the NPCU will request for a transfer of the equivalent of 3-months of expenditure for itself and a Governorate, directly from CBY to the respective operational YER account. On the justification of 75% of the previous advance and 100% of any preceding advances the next 3-month advance may be provided. SOE thresholds will be defined within the Letter to the Borrower and may be subject to change.

103. The NPCU may submit withdrawals for Direct Payment for a single expenditure in excess of USD 250,000 equivalent. The Authorized Allocation of the DA is USD 7,000,000 equivalent. An initial advance will be limited to USD 1,500,000 equivalent for IFAD, GEF and ASAP and USD 1,000,000 equivalent in EUR for the EC which will be deposited when the activities related to the funding start.

[19] The 2012 TI index ranks Yemen 156th of 176 countries with a rating of 23/100. An assessment of the programme's financial management arrangements was undertaken during design. The following documents were consulted: Yemen's PEFA (2008); USAID assessment on the Ministry of Agriculture and Irrigation (2008); USAID assessment on corruption in Yemen (2006).

Further advances will be based on the activities and the cash forecast within the approved annual work plan and budget. Additional advances will also be contingent on the satisfactory financial management performance as indicated during supervisions and in the annual audit reports.

104. Applications for replenishment or reimbursement, documenting expenditures, by the NPCU to IFAD, made from the DA will be submitted, at a minimum, every 90 days or when the expenditures have reached an amount of at least 30% of the Designated Account, whichever is sooner. Direct payments from IFAD may be made to suppliers/ contractors/ consultants as per the instructions in the LTB.

105. The NPCU shall make the proceeds of the Financing available to the Programme Parties upon terms and conditions specified in the Financing Agreement or otherwise approved by the Fund for the purpose of carrying out the Programme. All programme related expenditures, incurred by the coordinating PMU and the Governorate PMUs will be through checks or electronic transfers. Petty cash not exceeding USD 500 equivalent may be maintained securely by the cashier.

106. Expenditures will be borne by the office that has incurred the same, for example all activities under-taken in Dhamar Governorate will be expensed by the Dhamar PMU. It will be the responsibility of the NPCU to ensure that there is no build-up of idle funds in the Governorate accounts.

107. **Counterpart Funds**. GoY will be requested to place at least 6 months of financing in a separate account at the beginning of each programme year.

108. **Accounting System**. The programme is expected to have an accounting system in all PMU offices as well as the NPCU. As it is expected to use the existing resources available at the PMUs in Dhamar and Al-Dhala, a comparable system will have to be purchased for the NPCU and the new PMUs. System modifications will ensure that the accounting systems of the 5 Governorates are linked into the NPCU accounting system. **The setup of the accounting systems and the chart of accounts will be a condition for the first disbursement.** Therefore to facilitate implementation, retroactive financing will be permitted for the same.

109. **Taxation**. As per the Fund's policy, none of the proceeds of its Financing can be utilized for the payment of Taxes during the course of programme implementation. The Government of Yemen will cover the payment of taxes on all procurement (goods, services, works) undertaken by the programme, according to the Financing Agreement.

110. **Internal Controls**. As the PMUs and NPCU will be ring-fenced, the internal control mechanisms will be detailed within the Programme Implementation Manual (PIM). The approval of the PIM will be conditional for the first replenishment of the DA; the first disbursement (advance) may be processed, however subsequent replenishments will be approved after the PIM has been approved.

111. **Staffing**. The NPCU will have one finance manager and two accountants who will be responsible for the coordination and submission of all financial management and accounting related issues. The staff at the coordination unit will also include an Internal Auditor. Each Governorate PMU will be responsible for their financial management and accounting, and will be supported by a qualified accountant. Detailed Terms of Reference of Financial Staff at all levels are included in the Programme Implementation Manual (PIM).

112. **Financial Accounting and Reporting**. The Government of Yemen and all entities maintain their accounts per IPSAS cash basis. The fiscal year for Yemen is January 1 - December 31. The Governorate PMUs will generate quarterly financial reports to be submitted to the NPCU. These consolidated reports, for all the sources of financing will include: (i) statement of sources and uses of funds by category of expenditure; (ii) statement of sources and uses of funds by programme components indicating the funds received, cash forecast, expenditure report comparing actual and planned expenditures by activities; (iii) contracts ledger and contract monitoring forms showing all contracts with amounts committed and disbursed. The NPCU will submit the consolidated reports for each quarter to IFAD and they will contain the information from the Governorates and include the sources and uses of the funds at this level.

113. **Internal audit**. As the inherent risk in Yemen is high and due to the ring-fenced nature of the PMUs and NPCU, an Internal Auditor will be hired on a full time basis at the NPCU. The Internal Auditor will report to the National Steering Committee for the Programme. The Internal Auditor will be hired competitively and the TORs must be cleared by IFAD. The detailed functions of the Internal Auditor will also be defined within the PIM.

114. **External Audit**. The annual audited financial statements of the operations, resources and expenditures related to the Programme for each Fiscal Year, prepared in accordance with IPSAS cash basis, will be submitted to the Fund within six (6) months of the end of each Fiscal Year. The Programme will be guided by the IFAD guidelines in the preparation of their annual financial statements. The financial statements will be audited by an independent private sector auditing firm. The National Steering Committee will be responsible for the recruitment of the auditor based on the World Bank's list of the top-tier auditors in Yemen. A NOL for the TOR and the recruitment of the auditor will be obtained from IFAD. The fiscal year end of RGP will be December 31; therefore, the audited financial statements are due at IFAD no later than June 30 (within six months). The audit report will contain a separate management letter with an opinion on the Internal Control systems of RGP and related audit observations; separate opinions on certified Statements of Expenditure (SOE), the Special Account and the Programme Financial statements; a statement as to the adequacy of the accounting system and internal controls and whether IFAD funds have been used for their intended purpose; a confirmation that SOEs correctly reflect the expenditures incurred; and commencing with the second year audit a follow-up on the implementation of prior year recommendations. Submission of the audit report after the due date, of six months after fiscal year end, may result in suspension of the financing.

115. ***Withdrawals from the Loan Account***. Between the date of entry into force of the Financing Agreement and the Financing Closing Date, the NPCU may request withdrawals from the Loan Account and/or Grant Account of amounts paid or to be paid for Eligible Expenditures. The Fund shall notify the NPCU of the minimum amount for withdrawals. Details of the withdrawal procedures is further clarified in Appendix 7

116. **Retroactive Financing**. The maximum amount that can be withdrawn is USD 400,000 equivalent for the following specific activities: (i) recruitment of the key staff (ii) installation and deployment of the accounting systems; (iii) alternations to LGMIS; (iv) recruitment of a consultant for the preparation of the PIM and (v) mobilization and sensitization of the communities in Dhamar and Al Dhala Expenditures that are Eligible: The above expenditures will only be eligible for retroactive financing and thus reimbursed to the Borrower/Recipient after entry into force of the FA and satisfactory compliance with any conditions precedent to disbursement. The date after which expenditures become eligible for retroactive financing will be after the Programme has been approved by QA and will be defined within the Financing Agreement.

117. To be eligible for retroactive financing, expenditures need to be specifically identified as retroactive financing in the programme Work Plan and Budget for goods, works and services. This will include the related Procurement plan that will provide a detailed description of planned activities, related methods of procurement, quantities, estimated costs and the expected dates of finalization of Procurement activities. Both the specific WPB and Procurement Plan are subject to prior review by IFAD CPM. The expenditures must, of course, fall within the programme description and within one or more of the eligible categories.

118. **Covenants for Financing Agreement:**

- Opening of the DA in USD and EUR by NPCU and all PMUs.
- Recruitment and deployment of key programme staff.
- Installation and deployment of the accounting system at the NPCU and PMUs.
- PIM that has been approved by IFAD.

119. ***Financial Management Risk***. The mission has reached the conclusion that financial management risk is rated high due to inherent country risk. To mitigate this risk the following will be implemented: (i) ring-fenced PMUs and NPCU; (ii) a full-time internal auditor at the NPCU who reports to the National Steering Committee and not to the Programme Director; (iii) procurement and installation of multi-lingual (Arabic/English) accounting software before implementation begins in the PMUs and NPCU; (iv) ensuring that sufficient accounting staff, with appropriate qualifications and experience, are recruited; (v) communities will be involved in all phases of decision-making, planning, implementation and evaluation, as documented in this report and enshrined in the operational modalities of the programme, evaluation and impact assessment will be outsourced to independent institutions to ensure analytical objectivity; (vi) civil works will be verified by an independent consulting firm on an annual basis; and (vii) approval of the PIM by IFAD, which will detail among other things the internal control mechanisms in place, as a condition for first replenishment. Once the above mitigation measures have been implemented, the residual financial management risk will be rated medium.

Procurement

120. The procurement of goods, works and consulting services under the programme will be executed by both the NPCU and PMUs based on the procurement guidelines of Government and the respective financiers; as deemed consistent. For IFAD financing, the following procurement procedures and thresholds will apply:

121. ***Goods:***

- international competitive bidding for contracts over USD 200,000;
- national competitive bidding for contracts over USD 50,000 up to USD 200,000
- national shopping for contracts up to USD 50,000.

122. ***Works:***

- international competitive bidding for contracts over USD 1,000,000;
- national competitive bidding for contracts over USD 50,000 up to USD 1,000,000;
- national shopping for contracts up to USD 50,000.
- Procurement with community participation for small community-based contracts below USD 25,000

123. ***Goods and Works:*** As per Public Procurement Law, direct contracting for contracts up to USD 500 equivalent (YER 100,000).

124. ***Consulting Services*** - QCBS will be the standard method applied unless otherwise approved.

- through Request for Proposals for services estimated over USD 100,000;
- through Request for Quotations if less than USD 100,000;
- WB shortlist to apply for audit firms (international and national);

125. IFAD prior review will be applicable to the following: (i) all tenders under ICB; (ii) specifications, statements of requirements and Terms of Reference for goods, works and consulting services (where pre-approved standard bidding documents/ RFPs / RFQs are used); (iii) 1st two complete tenders for works under each method and all contracts for works estimated to cost USD 225,000 equivalent or more; (iv) bidding documents and award of any contract for 1st five goods' tenders under each method and all contracts estimated to cost USD 200,000 equivalent or more; (v) the solicitation and award of any contract for consulting firms estimated to cost USD 100,000 equivalent or more and all consulting services for individuals; (vi) all foreign contracted training; and (vii) any direct contracting or single-source selection.

126. The NPCU and each PMU will prepare 18-month procurement plans to ensure sufficient advance planning for procurement actions. Each PMUs procurement plan will be approved by its

respective Governorate Steering Committee before being consolidated at the level of the NPCU and submitted to the National Steering Committee and financiers. They will include: contract reference number; contract description; estimated costs; number of bid packages; procurement method; key dates; IFAD/other financiers prior review requirements. It will confirm that all goods, works and services procured will be exempted from duties and taxes.

127. The NPCU will procure goods and services that are common to all governorates (vehicles, equipment, audit services, specific international/national Technical Assistance) while PMUs will procure goods and services directly related to their activities. In that respect, PMUs will favor the integration of governorate-level service providers and will facilitate the development of a strong relationship between the programme, local service providers and communities.

Good Governance Framework

128. IFAD's Anti-Corruption Policy applies a zero-tolerance approach where it has determined, through an investigation performed by the Fund, the borrower or another competent entity, that fraudulent, corrupt, collusive or coercive actions have occurred in projects financed through its loans and grants, and it shall enforce a range of sanctions in accordance with the provisions of applicable IFAD rules and regulations and legal instruments. 'Zero tolerance' means that IFAD will pursue all allegations falling under the scope of this policy and that appropriate sanctions will be applied where the allegations are substantiated. This policy applies to IFAD-funded activities whether supervised directly by the Fund or by a cooperating institution.

129. Programme design includes specific measures to ensure transparency: (i) institutional arrangements: the programme will be coordinated by a NPCU and managed by PMUs based on principles of good governance, transparency, and accountability. Communities will be involved in all phases of decision-making, planning, implementation and evaluation, as documented in this report and enshrined in the operational modalities of the programme; (ii) ethics: a code of ethics will be applicable to, and signed by NPCU director, PMUs managers and employees; (iii) internal audit: the NPCU includes an internal audit unit directly reporting to the National Steering Committee; (iv) independent audit and evaluation: the NPCU and PMUs will be audited annually by a competitively-selected independent auditor, in line with international auditing standards. Evaluation and impact assessment will be outsourced to independent institutions to ensure analytical objectivity; and (v) supervision: IFAD's direct supervision includes modules on fiduciary compliance and the responsibility and accountability framework.

D. Supervision

130. The programme will be directly supervised by IFAD. Direct supervision is perceived and will be applied as a continuous process which requires ongoing communication and engagement with Government and NPCU/PMUs management. Direct supervision will encompass three areas: (i) loan administration, ensuring fiduciary compliance, with focus on legal conditions, financial management and disbursements, and procurement and contracting; (ii) programme supervision, assessing implementation performance, with focus on overall implementation performance and progress towards objectives, programme investments, activities and outputs, statutory requirements (AWPB, monitoring, reporting), steering, management, implementing institutions, targeting and gender mainstreaming; and (iii) implementation support.

131. Implementation support will be applied at three levels: (i) programme level: with focus on providing guidance towards achievement of objectives, supporting adaptation in response to evolving conditions, creating systems for sustainable flow of benefits, resolving operational issues and problems, generating lessons and articulating best practices; (ii) country level: with focus on introducing a broad programmatic view of development investments, influencing policy on the basis of operational experiences, developing systems and institutions for poverty reduction, facilitating financial and operational partnerships; and (iii) IFAD level: with focus on generating knowledge and

lessons, feeding operational lessons into new programme design, creating innovative instruments, investments, pilot activities, and enabling portfolio restructuring to improve outcomes and results.

132. Programme design will invariably be superseded by reality over time, as a result of changing conditions, emerging operational experiences, political and macro-economic changes, exogenous developments and force majeure. The supervision process will guide the programme towards the achievement of strategic objectives and broader poverty reduction outcomes, while ensuring fiduciary compliance and responsiveness to the accountability framework.

133. Supervision missions will be undertaken annually and complemented by short and focused follow-up missions as appropriate. The frequency and composition of supervision missions will be determined in light of actual requirements. In addition, each programme co-financier will also conduct supervision mission on all or part of RGP's activities.

E. Risk Identification and Mitigation

134. The programme's risks have been assessed and mitigated in the design. Residual risk is moderate or exogenous. The programme's design draws lessons from ongoing IFAD investments in Yemen, as well as those of other financiers and partners. The project's to be scaled up (ADCRMP, DPRDP, and CBRIP) were amongst the few projects to successfully continue implementation during the crisis. This was due to the facts that insecurity was mainly in urban areas and the project's themselves actually contributed to improving security in their project areas.

Table 4: Risks and Mitigation Measures

Risks	Possible consequences	Mitigation Measures
Security risks (UNDSS security levels in Yemen: 2 (low) to 5 (high).	Poor security conditions may adversely affect RGP implementation.	Previous programmes have continued to operate despite difficult security conditions. Expansion will be highly flexible in compliance with security issues.
Political instability	May inhibit Government decision making and slow implementation.	PMUs have full autonomy, accountability and independence.
Governance weaknesses	May prevent the public sector from managing and executing the programme.	PMUs operate on private sector principles and aim to develop a network of local private service providers.
Weak capacity of service providers.	Will have adverse effects on implementation, and on programme- supported enterprise performance.	Ongoing projects make extensive use of service providers who have proven their capacity. RGP will regularly assess quality of services through focus group discussion with beneficiaries. Contracts renewed subject to positive assessment.
Flow of funds delays (delayed transfers of funds to NPCU/PMUs)	Will have adverse implications for implementation and credibility with partners.	PIM will describe flow of funds in detail. PMUs will receive 3 months advances and subsequent advance when at least 75% of previous advance accounted.
Fiduciary management risk	May lead to financial, procurement and contract management weaknesses.	A range of fiduciary risk mitigation measures have been incorporated and are described in detail above.
Weather-related production risk	Impact of climate change could negatively affect agricultural activities and income of smallholders	Vulnerability assessment will guide programme interventions; research on drought tolerant crops will scaled-up; resilient infrastructure will support disaster-risk reduction; rehabilitation work will improve NRM. Capacity building on climate adaptation reduces vulnerability.

V. Programme Costs, Financing, Benefits

A. Programme Costs

135. The total programme costs including price and physical contingencies, duties and taxes are estimated at USD 127,4 million (YER 34.8 billion) over the seven-year implementation period as shown in Table 4. Total base costs amount to USD 120.0 million, while physical and price contingencies are estimated to add another USD 7,3 million (7% of the base costs) to this amount.

Table 5: Programme Costs – Per Year

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
A. Community empowerment.								
Al Dhala	836,727.8	1,253,722.7	963,944.3	478,742.6	168,322.8	6,656.8	-	3,708,116.9
Dhamar	836,727.8	1,253,722.7	980,248.6	493,996.8	168,322.8	6,656.8	-	3,739,675.5
Hodeida	908,325.3	1,541,912.8	1,621,861.8	1,215,893.1	590,246.5	90,798.8	-	5,969,038.3
Lahej	910,812.9	1,540,691.2	1,621,861.8	1,215,893.1	590,246.5	90,798.8	-	5,970,304.3
Taiz	851,715.4	1,519,657.0	1,527,475.3	1,142,081.3	597,366.8	-	-	5,638,295.8
Subtotal	4,344,309.2	7,109,706.3	6,715,391.6	4,546,607.0	2,114,505.4	194,911.2	-	25,025,430.8
B. Natural Resources Management and Resilient Infrastructure								
Al Dhala	1,728,107.1	3,254,001.7	3,926,188.9	1,800,499.3	18,056.5	-	-	10,726,853.5
Dhamar	1,728,107.1	3,256,612.4	3,928,761.3	2,181,061.7	18,056.5	-	-	11,112,599.0
Hodeida	159,413.7	2,062,878.9	3,361,671.4	2,863,373.1	906,737.8	19,075.8	-	9,373,150.7
Lahej	170,707.0	2,219,542.7	3,683,709.8	3,147,988.3	1,105,657.1	19,075.8	-	10,346,680.6
Taiz	1,740,705.8	3,312,463.4	3,927,361.5	2,128,957.8	747,512.8	-	-	11,857,001.3
Subtotal	5,527,040.7	14,105,499.1	18,827,692.9	12,121,880.1	2,796,020.7	38,151.6	-	53,416,285.2
C. Agricultural Development								
Al Dhala	1,856,646.8	2,225,097.7	870,488.5	554,000.1	75,235.5	-	-	5,581,468.6
Dhamar	1,551,309.6	2,366,299.9	1,353,618.3	1,076,185.9	75,235.5	-	-	6,422,649.3
Hodeida	860,853.7	3,051,787.1	2,868,004.2	1,639,951.7	195,612.4	-	-	8,616,209.1
Lahej	875,628.1	2,919,805.4	2,734,570.1	1,367,654.2	75,235.5	-	-	7,972,893.3
Taiz	1,249,912.3	2,967,338.7	2,714,412.1	1,785,672.1	75,235.5	-	-	8,792,570.8
Subtotal	6,394,350.6	13,530,328.8	10,541,093.3	6,423,463.9	496,554.5	-	-	37,385,791.1
D. Project Management								
Al Dhala	382,474.6	234,157.1	211,229.6	189,082.8	217,520.9	171,046.4	207,877.8	1,613,389.3
Dhamar	382,474.6	234,157.1	211,229.6	189,082.8	217,520.9	171,046.4	207,877.8	1,613,389.3
Hodeida	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
Lahej	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
Taiz	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
NPCU	480,078.9	594,935.5	617,714.5	875,577.8	327,786.1	244,043.2	312,018.6	3,452,154.6
Subtotal	2,392,451.7	1,765,720.9	1,754,814.3	1,820,991.9	1,415,390.9	1,099,275.4	1,351,407.7	11,600,052.8
Total PROJECT COSTS	18,658,152.2	36,511,255.1	37,838,992.1	24,912,942.9	6,822,471.5	1,332,338.3	1,351,407.7	127,427,559.8

136. Programme Cost by Component. Programme investments are organized into four components: (i) Community empowerment; (ii) Natural Resources Management; (iii) Agricultural development; (iv) Project Management. The detailed costs per components are presented in table 5 below.

Table 6: Programme Costs Summary by Component

	(YER)			(US$)		
	Local	Total	% Total Base Costs	Local	Total	% Total Base Costs
A. Community empowerment.						
Al Dhala	911,970,000.0	935,370,000.0	3	4,053,200.0	4,157,200.0	3
Dhamar	920,970,000.0	944,370,000.0	3	4,093,200.0	4,197,200.0	3
Hodeida	1,475,167,500.0	1,517,332,500.0	6	6,556,300.0	6,743,700.0	6
Lahej	1,431,427,500.0	1,517,332,500.0	6	6,361,900.0	6,743,700.0	6
Taiz	1,350,112,500.0	1,436,017,500.0	5	6,000,500.0	6,382,300.0	5
Subtotal	6,089,647,500.0	6,350,422,500.0	24	27,065,100.0	28,224,100.0	24
B. Natural Resources Management and Resilient Infrastructure						
Al Dhala	1,703,160,000.0	2,103,075,000.0	8	7,569,600.0	9,347,000.0	8
Dhamar	1,757,970,000.0	2,173,275,000.0	8	7,813,200.0	9,659,000.0	8
Hodeida	1,456,596,000.0	1,788,120,000.0	7	6,473,760.0	7,947,200.0	7
Lahej	1,609,794,000.0	1,972,867,500.0	7	7,154,640.0	8,768,300.0	7
Taiz	1,867,140,000.0	2,306,362,500.0	9	8,298,400.0	10,250,500.0	9
Subtotal	8,394,660,000.0	10,343,700,000.0	38	37,309,600.0	45,972,000.0	38
C. Agricultural Development						
Al Dhala	1,216,793,250.0	1,216,793,250.0	5	5,407,970.0	5,407,970.0	5
Dhamar	1,381,680,000.0	1,381,680,000.0	5	6,140,800.0	6,140,800.0	5
Hodeida	1,823,612,400.0	1,823,612,400.0	7	8,104,944.0	8,104,944.0	7
Lahej	1,694,041,200.0	1,694,041,200.0	6	7,529,072.0	7,529,072.0	6
Taiz	1,868,184,900.0	1,868,184,900.0	7	8,303,044.0	8,303,044.0	7
Subtotal	7,984,311,750.0	7,984,311,750.0	30	35,485,830.0	35,485,830.0	30
D. Project Management						
Al Dhala	308,970,000.0	325,372,500.0	1	1,373,200.0	1,446,100.0	1
Dhamar	308,970,000.0	325,372,500.0	1	1,373,200.0	1,446,100.0	1
Hodeida	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
Lahej	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
Taiz	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
NPCU	686,992,500.0	697,927,500.0	3	3,053,300.0	3,101,900.0	3
Subtotal	2,248,717,500.0	2,341,665,000.0	9	9,994,300.0	10,407,400.0	9
Total BASELINE COSTS	24,717,336,750.0	27,020,099,250.0	100	109,854,830.0	120,089,330.0	100
Physical Contingencies	779,616,000.0	974,520,000.0	4	3,464,960.0	4,331,200.0	4
Price Contingencies	6,259,069,524.4	6,808,868,754.3	25	2,856,670.9	3,007,029.8	3
Total PROJECT COSTS	31,756,022,274.4	34,803,488,004.3	129	116,176,460.9	127,427,559.8	106

137. **Programme costs by expenditure categories**. Civil works, vehicles, equipment, TA and services account for 36%, 1%, 29%, 2% and 9% respectively of the total base costs of the Programme. A further 17% is accounted for by the financial instruments. Investments costs represent 94% of the total base costs of the Programme. Recurrent costs represent 6% of the total base costs of the Programme with salaries and allowances accounting for 5% and Operation and Maintenance costs representing 1% of the total base costs of the Programme (table 6).

Table 7: Programme Costs by Expenditure Categories

	(YER)				(US$)			
	Local	Total	% Foreign Exchange	% Total Base Costs	Local	Total	% Foreign Exchange	% Total Base Costs
I. Investment Costs								
A. Civil works	7,796,160,000.0	9,745,200,000.0	20	36	34,649,600.0	43,312,000.0	20	36
B. Vehicles	30,240,000.0	302,400,000.0	90	1	134,400.0	1,344,000.0	90	1
C. Equipment and material	7,822,086,750.0	7,822,086,750.0	-	29	34,764,830.0	34,764,830.0	-	29
D. TA								
National TA	583,200,000.0	583,200,000.0	-	2	2,592,000.0	2,592,000.0	-	2
International TA	-	81,562,500.0	100	-	-	362,500.0	100	-
Subtotal	583,200,000.0	664,762,500.0	12	2	2,592,000.0	2,954,500.0	12	2
E. Studies, trainings and workshops	2,466,135,000.0	2,466,135,000.0	-	9	10,960,600.0	10,960,600.0	-	9
F. Financial instruments	4,488,885,000.0	4,488,885,000.0	-	17	19,950,600.0	19,950,600.0	-	17
Total Investment Costs	23,186,706,750.0	25,489,469,250.0	9	94	103,052,030.0	113,286,530.0	9	94
II. Recurrent Costs								
A. Salaries and allowances	1,293,435,000.0	1,293,435,000.0	-	5	5,748,600.0	5,748,600.0	-	5
B. Operation and maintenance	237,195,000.0	237,195,000.0	-	1	1,054,200.0	1,054,200.0	-	1
Total Recurrent Costs	1,530,630,000.0	1,530,630,000.0	-	6	6,802,800.0	6,802,800.0	-	6
Total BASELINE COSTS	24,717,336,750.0	27,020,099,250.0	9	100	109,854,830.0	120,089,330.0	9	100
Physical Contingencies	779,616,000.0	974,520,000.0	20	4	3,464,960.0	4,331,200.0	20	4
Price Contingencies	6,259,069,524.4	6,808,868,754.3	8	25	2,856,670.9	3,007,029.8	5	3
Total PROJECT COSTS	31,756,022,274.4	34,803,488,004.3	9	129	116,176,460.9	127,427,559.8	9	106

B. Programme financing

138. The programme will be financed by: IFAD resources of USD 15.0 million in the form of a grant (11.8% of total costs); Islamic Development Bank resources of USD 15.0 million in the form of a loan (11.8%); European Union resources of USD 16.0 million equivalent in the form of a grant (12.7%); Global Environment Facility resources of USD 10.0 million (7.9%); Adaptation for Smallholder Agriculture Programme resources of USD 10.0 million (7.9%); microfinance banks/institutions' contribution of USD 17.7 million (13.9%); Agriculture and Fisheries Production Promotion Fund resources of USD 12.7 million (10.0%); beneficiaries' contribution of USD 20.9 million mainly in-kind (16.5%), and Government resources of USD 9.3 million (7.3%). The Government's contribution covers the cost of duties and taxes as well as some investment costs for roads (table 7).

Table 8: Programme Financing Plan (USD '000) - by Component

	IFAD		ASAP		GEF		IDB		EU		MFBIs		AFPPF		The Government		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
A. Community empowerment.																				
Al Dhala	776	20.9	932	25.1	451	12.2	-	-	-	-	889	24.0	-	-	8	0.2	652	17.6	3,708	2.9
Dhamar	844	22.6	932	24.9	415	11.1	-	-	-	-	889	23.8	-	-	8	0.2	652	17.4	3,740	2.9
Hodeida	1,106	18.5	1,567	26.3	723	12.1	-	-	-	-	1,361	22.8	-	-	13	0.2	1,198	20.1	5,969	4.7
Lahej	1,106	18.5	1,553	26.0	723	12.1	-	-	-	-	1,361	22.8	-	-	28	0.5	1,198	20.1	5,970	4.7
Taiz	1,106	19.6	1,547	27.4	483	8.6	-	-	-	-	1,277	22.7	-	-	28	0.5	1,197	21.2	5,638	4.4
Subtotal	4,937	19.7	6,532	26.1	2,796	11.2	-	-	-	-	5,779	23.1	-	-	86	0.3	4,896	19.6	25,025	19.6
B. Natural Resources Management and Resilient Infrastructure																				
Al Dhala	-	-	-	-	636	5.9	2,385	22.2	3,613	33.7	-	-	384	3.6	906	8.5	2,803	26.1	10,727	8.4
Dhamar	-	-	-	-	644	5.8	2,385	21.5	3,613	32.5	-	-	567	5.1	918	8.3	2,985	26.9	11,113	8.7
Hodeida	-	-	-	-	674	7.2	4,336	46.3	2,439	26.0	-	-	-	-	1,343	14.3	581	6.2	9,373	7.4
Lahej	-	-	-	-	852	8.2	3,899	37.7	2,439	23.6	-	-	582	5.6	1,396	13.5	1,178	11.4	10,347	8.1
Taiz	-	-	-	-	695	5.9	2,376	20.0	4,018	33.9	-	-	628	5.3	1,102	9.3	3,038	25.6	11,857	9.3
Subtotal	-	-	-	-	3,501	6.6	15,383	28.8	16,121	30.2	-	-	2,160	4.0	5,665	10.6	10,585	19.8	53,416	41.9
C. Agricultural Development																				
Al Dhala	203	3.6	492	8.8	325	5.8	-	-	-	-	1,856	33.3	1,518	27.2	380	6.8	807	14.5	5,581	4.4
Dhamar	409	6.4	287	4.5	427	6.6	-	-	-	-	2,128	33.1	1,790	27.9	439	6.8	943	14.7	6,423	5.0
Hodeida	234	2.7	454	5.3	994	11.5	-	-	-	-	2,461	28.6	2,630	30.5	587	6.8	1,257	14.6	8,616	6.8
Lahej	234	2.9	454	5.7	879	11.0	-	-	-	-	2,542	31.9	2,163	27.1	541	6.8	1,160	14.6	7,973	6.3
Taiz	577	6.6	454	5.2	379	4.3	-	-	-	-	2,909	33.1	2,530	28.8	599	6.8	1,344	15.3	8,793	6.9
Subtotal	1,657	4.4	2,139	5.7	3,004	8.0	-	-	-	-	11,897	31.8	10,631	28.4	2,545	6.8	5,512	14.7	37,386	29.3
D. Project Management																				
Al Dhala	1,010	62.6	304	18.8	134	8.3	-	-	-	-	-	-	-	-	165	10.2	-	-	1,613	1.3
Dhamar	1,010	62.6	304	18.8	134	8.3	-	-	-	-	-	-	-	-	165	10.2	-	-	1,613	1.3
Hodeida	1,037	63.2	304	18.5	134	8.2	-	-	-	-	-	-	-	-	165	10.1	-	-	1,640	1.3
Lahej	1,037	63.2	304	18.5	134	8.2	-	-	-	-	-	-	-	-	165	10.1	-	-	1,640	1.3
Taiz	1,037	63.2	304	18.5	134	8.2	-	-	-	-	-	-	-	-	165	10.1	-	-	1,640	1.3
NPCU	3,252	94.2	-	-	-	-	-	-	-	-	-	-	-	-	200	5.8	-	-	3,452	2.7
Subtotal	8,384	72.3	1,520	13.1	670	5.8	-	-	-	-	-	-	-	-	1,026	8.8	-	-	11,600	9.1
Total PROJECT COSTS	14,978	11.8	10,191	8.0	9,971	7.8	15,383	12.1	16,121	12.7	17,676	13.9	12,792	10.0	9,323	7.3	20,993	16.5	127,428	100.0

C. Summary Benefit and Economic Analysis

139. **Benefits.** The programme will reduce poverty and food insecurity and increase smallholder climate resilience by stimulating resilient and sustainable rural economic growth. A total of about 176 000 households (c. 1.2 million people) will benefit. The key outcomes will be: (i) households and community resilience to shocks enhanced; (ii) infrastructure and natural resource base made climate

resilient; (iii) improved gender sensitive and climate resilient agricultural practices and productivity; and (iv) rural women and men with increased access to economic opportunities. During implementation actual numbers of investments and balance of activities will derive from the CAPs.

- **Households and community resilience to shocks enhanced:** Implementation of Community Action Plans in each of the 550 target communities, and integrating climate adaptation priorities based on vulnerability assessment will enable them to participate in the planning of their own development. Users' associations with responsibility for operation and maintenance of infrastructure for water harvesting, drinking water, land conservation, roads, and renewable energy will be established.
- **Infrastructure and natural resource base made climate resilient:** Constructing 275 water harvesting structures with a catchment area of 1 340 ha (13 400 households), developing access to drinking water in 120 village units (38 400 households) and restoring 1 150 ha of abandoned terraces to productive use (11 500 households) as well as climate proofing at least 244km of rural roads.
- **Improved gender sensitive and climate resilient agricultural practices and productivity:** Increased agricultural production due to better access to inputs, more efficient drip irrigation systems on 3 338 ha (33 380 households), improved agriculture diversification through greenhouses for 2 6500 households and provision of updated technical assistance by 1 100 VATs (1 male and 1 female in each VU). It is assumed that 70% of farmers and livestock keepers will adopt some improvements to their techniques and technologies benefiting 123 200 households through crop yield increases of around 30% on average, improved fodder production and livestock husbandry.
- **Rural women and men with increased access to economic opportunities:** Around 66 000 individuals (of whom at least 50% women) will develop or expand income generating activities and micro- and small enterprises using skills gained in literacy, life-skills, business management and technical trainings. 100 000 individuals will benefit from enhanced access to financial resources through Saving and Credit Groups and Associations and later through linkages with microfinance institutions. Improved access to drinking water will reduce time and labor women and girls spent in water collection and enable women to focus more on education, training and productive activities. Construction/rehabilitation of at least 244km of village roads benefiting 150 000 people (c. 700 beneficiaries per km) will reduce transportation costs and travel time, improve access to inputs, and increase income.

140. Table 8 shows the estimated cost per HH and per beneficiary for each category of investment. The overall programme cost is estimated at USD 710 per HH or USD 106 per beneficiary, assuming 6.7 people per HH and a total of 120 000 beneficiaries (as per logframe).

Table 9: Cost per beneficiary of different investments (in USD)

Investments	Amount (incl. cont. 000s USD)	# of HHs	Cost per HH USD	# of Beneficiaries	Cost per Benef. USD
Drinking Water	21.954	38.400	572	257.940	85
Off-farm Irrigation	12.078	13.400	901	90.010	134
Land Conservation	4.974	11.500	433	77.248	64
Roads	13.064			150.000	87
On-farm Irrigation	14.299	33.380	428	224.220	64
Greenhouses	13.542	26.500	511	17.801	76.1

Financial and Economic Analysis.

Financial Analysis

141. The objectives of the financial analysis are to: (i) assess the financial viability of the improved technologies and systems promoted by the project and (ii) evaluate the impact of the project's interventions on the cash flow and household incomes of the farmers involved.

142. For the purpose of the analysis several models have been prepared, including: wheat, sorghum (grain and fodder), tomatoes (open air and greenhouse), bananas, potatoes, coffee (new plantation), and lentil. The "without" project situation represents crops with insufficient irrigation or rainfed, the "with" project models illustrate impact of better irrigation on crop yields.

143. Summary of crop budgets, and underlying technical assumptions on which these models are based, are presented in the table 9 below. These budgets indicate that yields are expected to increase by 30% for most irrigated crops and 20% for rainfed crops. Yields of the major crops are projected to increase under irrigated and rainfed conditions compared to the "without" project situation due to increased and more secured water availability, more balanced use of fertilizer and improved farming practices. For rainfed crops, these increases are lower than for irrigated crops because of more limited potential for productivity increases in dry land farming conditions. In addition to the on-farm irrigation systems, the project will provide training to farmers on crop water requirements, irrigation schedule calculations and establishment of WUAs. Detailed crop and livestock models are provided in the Appendix to this Working Paper.

Table 10:Financial crops budgets summary

Financial crops budgets summary					
Crops	Unit	Yields		Incremental net benefits (YER)	Incremental net benefits (US$)
		Without project	With project		
Wheat (1ha)	kg	1,800	2,430	89,119	416
Sorghum grain (irrigated), 1 ha	kg	2,500	3,375	236,688	1,106
Sorghum fodder (irrigated), 1 h	ton	10	13.5	93,278	436
Sorghum fodder (rainfeed), 1 h	ton	9	11	57,636	269
Potatoes (1 ha)	kg	6,000	8,100	273,750	1,279
Tomatoes (1ha)	kg	3,000	4,050	273,000	1,276
Lentils	kg	700	840	39,000	182
Bananas (existing plantation)	ton	8	11	268,666	1,255
Coffee new plantation	kg	0	2,500	2,224,495	10,395

Economic Analysis

144. **Cost Stream.** In order to estimate the project's economic viability, in the form of the Economic Internal Rate of Return (EIRR), the cash flow calculated includes the project base costs (as extracted from the COSTAB tables shown in the Appendix) with their physical contingencies but without taxes and price contingencies (therefore in constant YER). The costs include all investments for all project components as well as their replacement (for transportation, office and computer equipment/materials, etc.) and recurrent costs (mainly operation and maintenance for transportation, equipment and materials). The Cost stream calculation is presented in the Appendix (10) .

145. **Benefit Stream.** The analysis attempts to identify quantifiable benefits related to the activities undertaken following the implementation of the components of the project. The incremental quantifiable benefit stream comprises following elements: (i) irrigation development, with medium and small water harvesting structures and spate irrigation; (ii) improved and facilitated access to drinking water; (iii) terraces rehabilitation and productive use of rehabilitated land; (iv) benefits from agricultural roads construction; (v) rangelands rehabilitation; (vi) greenhouses; (vii) IGAs.

146. **Project Estimated Return.** The base case Economic Internal Rate of Return (EIRR) is estimated at 15%. It has to be noted that the base EIRR includes the costs of all investments for all project components as well as their replacement and recurrent costs; on the benefits side, it includes

exclusively the benefits quantified previously. The base case net present value of the project's net benefit stream, discounted at 10%, is YER 10.8 billion. The summary of the economic analysis is presented in the Appendix. (10)

147. **Sensitivity analysis**. Sensitivity analysis assessed the effect of variations in benefits and costs and for various lags in the realisation of benefits. A number of scenarios were tested to establish the economic viability of the total project in the event of adverse factors. Sensitivity analysis shows (table 10) that this base rate is slightly more sensitive to benefits delays, than to cost overruns or benefits shortfalls of the same magnitude occurring over the same period.

Table 11: Sensitivity analysis

The base EIRR	15%
20% costs overrun	13%
20% benefits shortfall	12%
Benefits delayed (2-years delay)	11%

D. Sustainability

148. **Sustainability**. The sustainability of programme interventions is ensured by the integration of lessons learned during implementation of projects being scaled-up, particularly with regard to: (i) empowering communities to drive planning, implementation and monitoring and evaluation to the extent feasible; (ii) ensuring sustainability of infrastructure investments through effective mobilization, training and regular follow-up of user associations by specialized field staff with a deep understanding of communities in which they work and extensive training in conflict resolution; (iii) linking saving and credit groups to microfinance institutions; and (iv) providing incentives to service providers to improve the quality of services offered to clients through performance-based contracting and supporting private agricultural and livestock extension providers (VATs). The climate financing and integration of adaptive planning will ensure that investments are more sustainable and contribute to vulnerability reduction.

149. **Scaling-up**. The Rural Growth Programme will scale up, to incremental communities and governorates, the successful approaches, methodologies, and activities of three ongoing projects. Scaling up drivers, spaces and pathways emerging from the three projects and from the new political and institutional environment in Yemen are described in the following figure and lay the foundation for further scaling up in future.

Figure 2: Scaling Up Framework

Main Interventions to be Scaled-Up	(i) Community-driven implementation based on Community Action Plans; (ii) provision of basic infrastructure, drinking water, training and access to financial services and markets based on community priorities.
Whose idea	Communities not targeted during the first phases requested support which led to discussions between Government and IFAD on the possibility of scaling-up.
Pilot/test/evaluation	Most of the interventions to be scaled up have already been piloted and evaluated as successful.
Vision/Target Scale	Expansion to all governorates of Yemen.
Drivers	
Champions	Government (MoPIC, MoF, MoAI, MoPWH, Governors), private sector partners, IFAD
External Catalysts	Investment opportunities in sectors with market demand and growth potential; commitments of investment from partners; food and fuel price crisis; climate change and Arab Spring

Local drivers	Political transition; need for economic diversification; declining natural resources; water shortages; poverty, food insecurity and unemployment.
Incentives	Political incentives: Increased commitment of Transitional Government to poverty reduction and development. Economic incentives: Desire for increased incomes and food security incentivizes target groups, local entrepreneurs, and service providers. Social/personal incentives: Communities want a voice to express needs and set own development priorities; women want to be able to read, to work, to run their own business and to control their own finances; young people want employment.
Spaces	
Policy, legal, regulatory space	Government policies on poverty, food security, water and economic growth. Legal and regulatory framework for registration of Community Development Associations and for community contracting.
Financial and fiscal space	Government facing budgetary constraints but prioritizing Programme activities. AFPPF has significant funds available. Existing community development plans are being integrated into public planning and budgetary systems at local, district, and Governorate levels. Significant donor resources committed and scaling up will significantly increase Yemen's aid absorption capacity Yemen. Projects to be scaled up have proven capacity to effectively and efficiently utilize available resources.
Political space	Political transition focused on delivering transparent and accountable governance and equitable distribution of resources and opportunities.
Institutional space/ organizational	NPCU based in Sana'a to facilitate participation in planning/strategy/policy dialogue. Established experience of the PMUs for Dhamar and Al-Dhala. . CDAs provide space at local level and integrated into the public administration.
Natural resource/ environmental **space**	Natural resources weak but investment in watershed management, rainwater harvesting, soil conservation will increase access to water, prevent soil erosion
Cultural space	Traditional views on women an obstacle to scaling-up. Evidence from Dhamar and Al-Dhala shows space needs awareness raising, quotas for women's participation and gender balanced field teams.
Partnership	Mobilization of partners for financing, design and implementation of the Programme ongoing leveraging key long term partnerships.
Knowledge/learning space	NPCU links PMUs into a national web of learning and knowledge sharing. NPCU staff will identify and promote best practices and encourage replication. NPCU in Sana'a will facilitate policy dialogue.
Implementing space	PMUs located close to the field. PMU management and staff recruited competitively and paid competitive salaries. Design not overly proscriptive - this allows for adaptation during implementation based on contexts and needs in different These arrangements proven to enhance resilience to crises.
Pathways	
Time horizon	20 years: (a) Phase 1: Innovation - 2000/2013 (complete); (b) Phase 2: Scaling-up - 2014/2020; (c) Learning – Continuous
Dimensions	(i) Outreach: increase number of beneficiaries (initially up to 1.2 million); (ii) Horizontal: increase geographic coverage (initially from 2 to 5 governorates); (iii) Vertical: move up from Governorate-level PMUs to national-level NPCU; (iv) Functional: focus on areas of proven success
Scaling-up milestones	Appropriate scaling-up indicators will be incorporated in the final logframe, including indicators for policy impact and replication in new Governorates
Role of drivers and spaces	Local drivers provide direction for scaling-up (rural poverty, food security, employment, NRM)
IFAD's role	Financing expansion; replication, adaptation; implementation support; learning knowledge management and dissemination of results; policy dialogue; championing communities.
Impact on scaling-up processes	Significant and sustainable reductions in rural poverty and food insecurity

150. **Exit Strategy**. Accelerating the process of decentralization, including of agricultural and other services, will be a major priority of the Transitional Government. Strengthening of Governorate, District and *uzla* level capacity for planning and implementation of development projects will be essential to its success. The focus of the RGP exit strategy is capacity building of Government structures and agencies at Governorate and district level through their close involvement as implementing partners in the programme and their involvement in steering committees. It is intended that over time PMUs will be increasingly integrated within the Governorate and District level structures but this will not begin until after the completion of the transition period and approval of the new constitution which could significantly impact on this process. This is expected to be completed by the mid-term and developing the exit strategy will be a key focus of the second mid-term review (PY5). The feasibility of establishing an Office for Rural Development Coordination in each Governorate with a structure and functions based on PMUs will be explored during early implementation. The objectives of such department will be to: (i) coordinate efforts and activities related to rural development whether financed by government, the private sector or external financiers; (ii) attract and ensure effective management of resources allocated for rural development; and (iii) ensure that community-driven approaches and methodologies are mainstreamed.

Appendix 1: Country, sector and rural development background

A. Economic, policy, business and regulatory framework

Economy

1. Yemen is a lower middle-income country with a population of about 25 million. GDP per capita is USD 1 367 in nominal terms (IMF, 2012) and GNI per capita is USD 1,110 (WB Atlas Method, 2011) just above the low income/lower middle income country threshold of USD 1,035 per capita.

2. From 1995 to 2000 Yemen implemented an Economic, Financial and Administrative Reform Programme proposed by IMF and World Bank. The programme was fairly successful and resulted in robust GDP growth averaging 5.2% per annum. Since 2000, economic growth decelerated to levels below population growth due to internal security concerns, a slowdown in economic reforms, reduced private sector investment, and declining oil production. Oil and gas represented 66% of Government revenue in 2002, rose to 76% in 2006 and dropped to 70% in 2009. Between 2001 and 2008, official inflation rates averaged 11.1%, and increased to 18.9% in 2009 and 19.5% in 2011, as of early 2013 it had fallen to 9.9% reflecting strengthening of the Yemeni rial, easing of supply problems and stabilization of world food prices.

3. Political upheaval and security issues since the beginning of the 2011 have caused an acute deterioration of economic, financial and monetary indicators and severely affected the livelihoods of millions of people creating a situation which is teetering on the edge of a humanitarian disaster. This situation can be characterized as follows:

- **Weak GDP Growth**. GDP contracted by more than 12% in 2011 and showed only modest growth of 2.4% in 2012; growth of closer to 5% has been predicted for 2013.
- **Weakening Public Finances**. Yemen's public finances are reaching critical levels due to the crisis and the resulting fall in tax and oil revenues. The budget deficit, maintained at about 2% due to oil price increases since 2004, expanded to almost 10% in 2011 due to disturbances to the economy caused by the political instability. Revenues from oil are expected to decrease to zero by 2025 when Yemen's reserves are predicted to be depleted; Yemen is likely to become a net importer of oil by 2016. Gas revenues may replace oil revenues to some extent but part of the incremental deficit must also be covered by rapid development of other sectors with export potential such as coffee, honey, fisheries, natural stone and other manufactures and services if a fiscal disaster is to be averted. A set of financial austerity policies have been implemented with harsh consequences on both the development process and living standards.
- **Inflation**. Price hikes and depreciation of the national currency against foreign currencies have led to soaring prices since 2011 with the interbank rate emerging ranging between YER 235-240 per USD 1, despite stabilization of the official exchange rate at YER 213.85 to USD 1. This increases the price of imports and drives inflation eroding the purchasing power of Yemeni households, particularly with regard to staple foods which are largely imported.
- **Weakening Public Services**. Basic service provision is limited and declining with electrical power covering only 42% of the population, water supplies and sanitation services covering only 26% and 16% of the population respectively, and security, judiciary and local authority services only provided to around one-third of the population.

Policy

4. As a consequence of the change of government in 2011, many policies of the previous government have been terminated or are in the process of being revised by the Transition Government. The major coordinating framework for current Government policy is the ***Transitional Program for Stabilization and Development (TPSD) 2012 - 2014***. Its overarching goal is to '*restore political, security and economic stability and enhance state capacity*'. The TPSD is built around two pillars: (i) political and security stability and state capacity, and (ii) socio-economic recovery. The first

pillar includes two focus areas: (a) implementation of the GCC agreement, and (b) good governance, while the second pillar includes three focus areas: (a) humanitarian, reconstruction, and emergency needs; (b) economic recovery, stabilization and growth foundations, and (c) human development and Millennium Development Goals.

5. In the medium and long-term, the promotion of economic growth to reduce unemployment and alleviate poverty will rely on the six main themes:

- ***Revive economic growth*** through a package of inclusive and equitable policies and programs to create the appropriate environment for promoting productive sectors, with special attention given to gender equality and women's labor force participation, developing the agricultural sector, enhancing food security, achieving the optimum, exploitation of fisheries, reviving the tourism sector and intensify efforts for expanding the exploitation activities for oil and gas. It targets GDP growth of 4.5% during 2012-2014 and an annual increase in the average net per capita income of 1.5%.
- ***Improve infrastructure*** including (a) expansion of production, transmission and distribution of electrical power, including through renewable sources of energy; (b) finalization of roads networks, especially in rural areas; (c) improvement of water resources management with adaptation to climate change and environmental protection; (d) accelerating competition in the transportation sector; and (e) ensuring access to infrastructure development for marginalized groups such as women and youth.
- ***Expand social protection*** including (a) expansion of mechanisms and programmes for financing small and micro projects for poor people; (b) empowerment of poor groups, especially rural women, to access productive assets; (c) favor labor-intensive investments in all economic sectors with special emphasis on women's and youth labor force participation.
- ***Human resources development*** through increased basic education and girls' enrolment, developing training capacities through partnerships between universities and private sector, creation of effective mechanisms for involving civil society organizations, increasing the number and improving services of central hospitals in governorates.
- ***Enhance the role of private sector and improve the business climate*** through continuous improvement of the legislative and institutional framework by enacting and implementing new laws such as the Law on Public Private Partnership in the field of infrastructure; identification of promising economic sectors through an investment map; simplifying business activities with a specific window for businesswomen under a one-stop-shop system; focus on SMEs development as a main vehicle for sustainable growth; enhancement of private sector competitiveness, accountability and transparency, and implementation of a national investment promotion strategy.
- ***Development of good governance*** through on-going civil service and administration reform; enhanced performance of judicial authorities; enhanced transparency, accountability and anticorruption efforts in the public sector; starting the national Local Governance Strategy to support the development process in governorates; implementing a gender-oriented strategy to ensure their political and economic empowerment.

6. The ***National Agriculture Sector Strategy 2011 – 2016*** aims to increase growth, sustainability, and equity, through increased productivity of crop and livestock, increased rural employment, and increased rural incomes, particularly for the poor. This will be achieved through: (i) improving input supply and availability of agricultural credit, increasing efforts to expand rain-fed agriculture, increasing recognition of the role of rural women; (ii) improving marketing efficiency, decreasing post-harvest losses and developing exporting capacities; and (iii) preservation of the environment and natural resources through watershed management, terrace rehabilitation, wadi banks protection and adoption of modern irrigation techniques.

Business and Regulatory Framework

7. In 2012 the World Bank's indicators for "Doing Business" rank Yemen as 99th out of 183 countries; since 2007 Yemen's ranking has ranged between 113th and 98th. Yemen's highest ranking indicator has consistently been in enforcement of contracts (currently 38th in the world) in which it ranks the highest of all countries in the Middle East and North Africa region[20], though costs and time involved can benefit the economically stronger party in a disagreement. Yemen's worst rankings remain in getting credit (159th), protecting investors (133rd), trading across borders (118th), paying taxes (116th), and resolving insolvency (114th). These are also amongst the most significant constraints for the MSME sector.

Table 1: Doing Business indicators 2007 - 2012

Indicator	Rank							
	2007	2008	2009	2010	2011		2012	
					Global	Regional	Global	Regional**
Ease of Doing Business	98	113	98	99	105	9	99	10
Starting a Business	171	175	50	53	57	6	66	5
Dealing with Construction Permits*	39	35	33	50	50	5	35	5
Registering Property	43	44	48	50	53	5	55	6
Getting Credit	117	158	172	150	152	14	159	14
Protecting Investors	118	122	126	132	132	15	133	17
Paying Taxes	89	84	138	148	146	17	116	17
Trading Across Borders	107	128	126	120	123	15	118	14
Enforcing Contracts	37	41	41	35	34	1	38	1
Resolving insolvency ***	82	83	87	89	90	9	114	12

* Called 'Dealing with licenses' until 2008; ** 20 countries in the Middle East and North Africa; *** Called 'Closing a Business' until 2011

B. Rural institutions

Community Organizations.

8. Since the late 1990s, community level NGOs have proliferated throughout Yemen. Their initial emergence was triggered as awareness spread that foreign funding organizations and parastatal institutions, such as the SFD and PWP, were interested in working with local NGOs. Most communities established and many registered these institutions with the primary objective of obtaining funding for social infrastructure such as schools and health centers, as well as other support for their communities. Their level of activity generally depends on the availability of funding; those with funding are very active while others await funding having done little more than establish themselves as formal institutions with a board of management. They are typically initiated by active community members, such as teachers, returned migrants or others with experience of the cities and of development possibilities, or by more traditional, religiously-minded individuals and local traditional leaders. Most of these organizations have the following strengths and weaknesses:

Strengths

- High-level of representativity of the interests and concerns of the community, particularly with respect to social infrastructure.

Weaknesses

- Leadership composed of either traditional or modern 'elite' with low female involvement.
- Low management capacity.

[20] Doing Business Report 2011. Countries in the region are: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, West Bank and Gaza, Yemen,

- Limited democratic governance - formal leadership positions tends to be retained for lengthy periods and changes only with balance of power in community, rather than elections.
- Variable negotiating capacity with outside agencies, depending mainly on the personality and influence of leading individuals.

State Institutions

9. ***Village level***. In rural Yemen, the lowest level of administrative division is the uzla or, in the Southern Governorates, the *markaz*. Both of these have small populations of a few thousand people either living in a single village or in a series of smaller hamlets. These are socially cohesive, containing members of a broad extended tribal family as the core inhabitants. They may also have a few members of lower social status groups among the population.

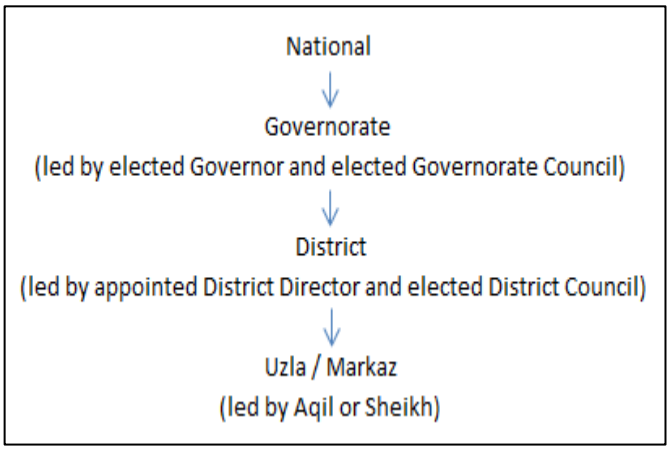
10. The representative of the State in villages or uzla is the *aqil*. These are often local community leaders such as a *shaykh*. The *shaykh* is commonly a senior villager, often from one of the families present in the village for many centuries, and also one of the wealthier villagers, probably the largest or one of the largest landowners of the community. The *shaykh* is recognized by government at the district and governorate level. Other than the *aqil* and/or *shaykh*, there are rarely any other government or state representatives at village level.

11. ***District***. The District is the level at which staff from all main line ministries should be present, though that is often not the case in reality. The District Director is appointed by Central Government. There is usually at least one staff person from one or more of the security institutions, and often a representative of the Ministries of Health and Education, who are responsible for ensuring that the agencies depending on their ministries are functioning as they should. Agricultural Extension staff are often found at District level, particularly where donor funded projects have built Extension Centers. These centers normally include housing for the staff and families. There are no women extension staff at this level. In addition to civil servants, the district is also the lowest level of political representation. Local District Councils are formed of elected members with responsibility for agreeing local budgets and setting expenditure priorities. They have extremely limited resources.

12. ***Governorate***. The Governorate is the main administrative unit below national level. It is the location of state presence outside the capital. The 20 Governorates have elected councils who are responsible for allocating budgets, though their income is extremely limited, and most activities are financed by Central Government through the Ministry of Finance and Treasury. The Governorate Councils meet regularly and are composed almost exclusively of men, most of whom are tribal and other community leaders. In each governorate capital there are representatives of all relevant ministries, including Planning, Finance, Public Works, Education, Agriculture, Health, Social Affairs and Labor, and the Ministry of Interior. Each have staffed offices, though their efficiency, equipment and commitment vary with some functioning more efficiently than others. The main constraints are the inadequate devolution and availability of financing which is not sufficient given the financial responsibilities of the Governorates.

13. Each of the 20 governorates of Yemen [in addition to the capital, Sana'a] has a Governor who, since 2009 has been elected by the Governorate Council. The introduction of elected Governors came in response to the high levels of dissatisfaction of citizens with the process of decentralization. Although the Decentralization Law came into effect in 2002, in practice the lack of finance available to Governorates has been a major hindrance to its implementation. Governorates have been given responsibility without the means to implement it. Lack of finance remains a problem under the Transitional Government, but addressing decentralization is one of the many important issues that will be discussed during the National Dialogue. It is expected that significant changes will be made with regard to decentralization and the operation of the Governorate administrations during the implementation period of the RGP.

Figure 1. Structure of Administration



C. Agriculture

14. Yemen has four main agro-ecological zones: (i) the highland zone (covering 44% of cultivated land and 60% of farms); (ii) the eastern plateau (26% of cultivated land and 19% of farms); (iii) the Tihama zone (26% of cultivated land and 10% of farms); and, (iv) the coastal zone (4% of cultivated land and 10% of farms). Arable land is estimated at 1.45 million hectares, but land under cultivation varies annually due to rainfall fluctuations. About 51% of cultivated land is rainfed, 30% is irrigated using groundwater pumped from wells, 10% is under spate irrigation, 6% is irrigated from dams, and 3% is irrigated by other sources. In 2009/2010, about 94% of arable land was cultivated (1.31 million hectares), of which cereals accounted for 52.0%, fruits and vegetables 13.8%, fodder crops 12.5%, qat 11.7%, other cash crops (coffee, cotton, sesame, tobacco) 6.7% and legumes 3.3%. Grazing land is estimated to extend over 20 million hectares. The groundwater irrigated area was 420 000 ha (almost 11 times from 37 000 ha in the 80's) while the rainfed cultivated area was 695 388 hectares (from 1.06 million ha in the 80's)[21]. The remainder was flood/spate irrigated.

15. From 2000 to 2005, agriculture was the main source of income for 74% of the population, constituted 21% of GDP, employed 31% of the labor force, and accounted for 57% of non-oil exports[22]. In addition, the agriculture sector also accounts for significant employment in the transport, processing, and trading sectors that may raise the percent employed by the agriculture sector up to 54%. In 2012 the share of agriculture in GDP is1990s when it accounted for 30%. Agriculture consumes about 90% of the country's water resources.

16. Agricultural production is constrained by the weak technological base of the sector, resulting in modest growth of less than 4% p.a. between 2003 and 2007. The productivity of Yemeni agriculture (particularly crop and livestock sub-sectors) is at least 50% lower than in other Middle Eastern countries with comparable environments[23]. Post-harvest losses due to poor handling, packaging and transport are estimated to affect about 20-30% of crop output. Irrigation systems are inefficient, resulting in significant waste of water, estimated to be in the range of 50% to 65%. Livestock are a major element of all rural households. Animal traction is still the main mechanism for land ploughing and leveling in most of the programme areas, and these assets are owned by individuals in the villages who use them on their own land as well as rent out their animals and equipment to neighbors who don't have their own. While mechanized agriculture is important on the large plain landholdings of Hodeida Governorate as well as some parts of Lahej Governorate, overall the small size of holdings and the mountainous terrain mean that use of tractors is both impractical as well as being expensive.

[21] Source: Estimated data from Ministry of Agriculture and Irrigation (updated figures from 2008).
[22] Yemen's Development Plan for Poverty Reduction, 2006-2010.
[23] A World Bank Country Study: Economic Growth in the Republic of Yemen, World Bank, 2002, p.23.

17. Agriculture and fisheries are the most important non-oil exports. Fisheries account for 43% of the value of non-oil exports while agriculture accounts for approximately 38% (tea and coffee (5%), tobacco (2%), honey (1%), other food and fruits (30%).

18. ***Land Rights***. There are four types of traditional land ownership: (i) communal land - *al bilad* (the land); (ii) private land - *milk khaas*; (iii) state land - *aradi al-dawla*; and (iv) religious endowment land - *aradi waqf*. Communal land used for grazing is the most common. As so little arable land exists and communal land is extremely important to rural livelihoods as source of income and protein. Ownership of communal land is defined by tribal boundaries as agreed by the tribes within their informal but strong legal system - *Urf*. A local elder, often the village *imam*, is also the *Sayyid*, who implements the *Urf* and maintains records of land ownership. Rural people typically have handwritten records describing the land they own. In the highlands operation of numerous landholdings at different altitudes (i.e. coffee over 1 800m, maize at 1 300m) is a crucial aspect of livelihood diversification. A farmer may have several fields at different altitudes to reduce vulnerability resulting from uncertain rainfall at different altitudes. Traditional claims of ownership sometimes conflict with constitutional and legal provisions for land ownership as there is no strong mechanism being implemented for registration of ownership of rural land.

19. ***Environment Protection and Natural Heritage***. Law No. 26 of 1995 on Protection of the Environment has as its objective the protection of the environment, combating pollution and protecting natural resources, society, human health and living beings from activities that damage the environment. It requires the performance of an Environmental Impact Assessment for all projects proposed by Government, public, private and cooperative agencies. The Environment Protection Authority (EPA, under the Ministry of Water and Environment is responsible for enforcing the Environmental Protection Law and reviewing the EIA for projects which may have adverse impacts on the environment, together with the responsible authority in the relevant ministry. The EPA can issue a qualified or unqualified opinion, or can reject a project for environmental reasons. However the requirement to undertake EIAs is not fully enforced. The Water Law No. 33 of 2002 establishes legislation for managing and protecting surface water and aquifers from pollution and to prevent activities that may lead to degradation or pollution of water quality. EIAs are also required under this law to study impact of proposed industrial activities.

D. Challenges for the Agriculture Sector

20. ***Land Tenure and Small Landholdings***. Smallholder agriculture is the dominant form of agriculture throughout Yemen, though many holdings are cultivated by tenants or share croppers. In mountainous areas, the agricultural plots consist of small terraces, and seemingly impossible slopes are farmed. In the coastal plains (the Tihama, which covers the vast majority of Hodeidah governorate), the land tends to be owned by large land holders; small farmers are interspersed among large farms and the majority of rural poor people work as casual daily laborers as well as tenants and sharecroppers. Many of the landless poor find work on large commercial farms. Small scale animal raising is also practiced by the landless, and many households have their own milk cow for household milk consumption. Tenant farmers face particular difficulties, in that they cannot improve their perennial horticultural production (fruit trees, coffee) without approval of the land owner, which limits their ability to invest in better production techniques or varieties. In general, subsistence farmers in Yemen all suffer from the lack of effective organizations.

21. ***Limited Water Resources***. Water availability per capita is amongst the lowest in the world at 150m3 per capita per annum and national utilization of water is at approximately 135% of renewable resources. Availability of water is the main constraint to development of agriculture sector in all parts of Yemen though already 90% of available renewable freshwater is used for agriculture. Yemen relies on two main sources of water: rainwater and groundwater as Yemen has little permanent surface water. The average annual rainfall ranges between 200-800mm, while the rainfall in the three governorates of Ibb, Al-Mahweet and Hajjah is about 1 200mm. Much water is extracted from deep wells which are being drilled ever deeper as water tables sink, pumping facilitated by subsidized

diesel prices. Highland groundwater basins are experiencing rapid declines in the water table as competition for this dwindling resource is fierce. At the current rate of pumping, groundwater levels are declining 1-4 meters per year (and up in some basins to about 7 meters per year). Once this resource is depleted, there is no replacement and the continuation of farming, and even possibly habitation, may be in doubt. Coastal areas are also utilizing ground water at an unsustainable rate, and salinity is becoming a serious problem. A report in 2010 estimated that groundwater reserves currently supplying Sana'a will be fully depleted by 2025. Furthermore 750 000 jobs in agriculture could be lost over the next decade due to decline in water availability.

22. The Ministry of Agriculture and Irrigation implemented several investment projects aimed at improving water resources use and management and increasing irrigation efficiency through introduction of modern irrigation and water saving technologies. In 2010, the area covered by water-saving technologies reached 36 500 hectares (8.7% of the total area irrigated by groundwater). This has largely been achieved with subsidies of up to 70% of the cost of these technologies, accompanied by irrigation extension services, organizing farmers in water users associations and groups and technical and institutional support. The main problem facing irrigation infrastructure is operation and maintenance.

23. ***Increasing Qat Production***. *Qat* production is increasing in Yemen, displacing food crops, and utilizing limited groundwater. *Qat* cultivated area was estimated at 153 000 ha in 2009 (from 7 000 ha in 1970), representing about 22.5% of irrigated area. *Qat* production consumes more than 40% of agriculture water and is mainly cultivated in the highland where water scarcity is critical. *Qat* consumption is also considered to have a negative impact on society as whole, as low income families spend a high percentage of their financial resources on qat consumption. It is estimated that between 70 percent and 80 percent of Yemeni adults chew *qat*, with nearly 15 million person-hours per day spent in chewing *qat*. The daily *qat* for one person requires about 500 liters of water for production, hence rapidly diminishing ground water supplies. However *Qat* production, trade and consumption account for 20% of GDP, provides employment to about half a million people, contributes almost one-third of value added in the agriculture sector, and rewards producers with high incomes. Farmers favor *qat* cultivation for its high returns - more than four times that of fruit.

24. ***Marketing and Promotion of Yemeni Products***. Marketing of agricultural products in Yemen has many challenges. Small scale farmers have little access to extension that will provide them with advice on markets for their products, and an effective Market Information System (MIS) is not operating in Yemen. Small farmers are also disadvantaged by limited marketing opportunities provided by traditional retail and wholesale markets, and the lack of associations and organizations. Markets for agricultural products are inefficient, and most products are not consistent with international specifications. The value chain is not well developed for many products, as the processing, packaging, and storage industries are at a low stage of development. Markets operate freely with little government intervention. Additional support is needed in the areas of extension, rules to strengthen farmer cooperatives and associations, setting and enforcement of grades and standards to improve quality, and provision of credit to support the growth of the processing, packaging and storage industries.

25. ***Insufficient availability of credit***. Demand for financial services in rural areas is generally unmet. In the absence of microfinance institutions and considering the stringent requirements from banks to access loans (in particular, the collateral requirement), rural households mostly rely on family/relatives loans or on loans extended by money-lenders. Such a limited access to loans with affordable conditions hinders investments and contributes to the stagnation of the rural economy. To develop their activities in line with market demand, small farmers and entrepreneurs require: working capital loans and investment loans at affordable interest rate (around 10%) and with fine-tuned terms and conditions to meet the cash-flow and production cycles of their production; leasing as a substitute financial instruments for long-term loans which will reduce the risk for the lending institution and the burden for the farmer; equity financing for small and medium enterprises that in rural areas are generally family-owned and are under-capitalized; hence limited access to bank loans.

26. The Yemeni Government provides credit, grants, and interest free loans through the Agriculture and Fisheries Production Promotion Fund (AFPPF) to many individual farmers or members of agricultural cooperatives that are registered with the Agricultural Cooperative Union (ACU). However, to be registered with the ACU, cooperatives need to demonstrate significant capital resources and have a minimum number of members, who in turn need to have access to a minimum land size. Therefore, this source of loans and grants is only available to medium to large farmers, and not to many small farmers or to smaller cooperatives not registered with the ACU. The Cooperative & Agricultural Credit Bank (CAC Bank) has recently made its transition into a full service commercial bank. CAC Bank still provides a variety of products for the agriculture sector, with interest rates set by the government of Yemen. However, all loan products are available only to land owners, thus leaving landless and tenant farmers, who are among the poorest, out of consideration. Although limited in outreach, microfinance banks have recently started to finance agriculture but their combined rural networks are still insufficient to cover all rural governorates, their operating costs are high and lead to high service fees which are not affordable for poorest farmers. In general, availability of credit appears to be a significant constraint for poor and/or landless farmers, while larger farmers and commercial ventures appear to be able to access credit and grants.

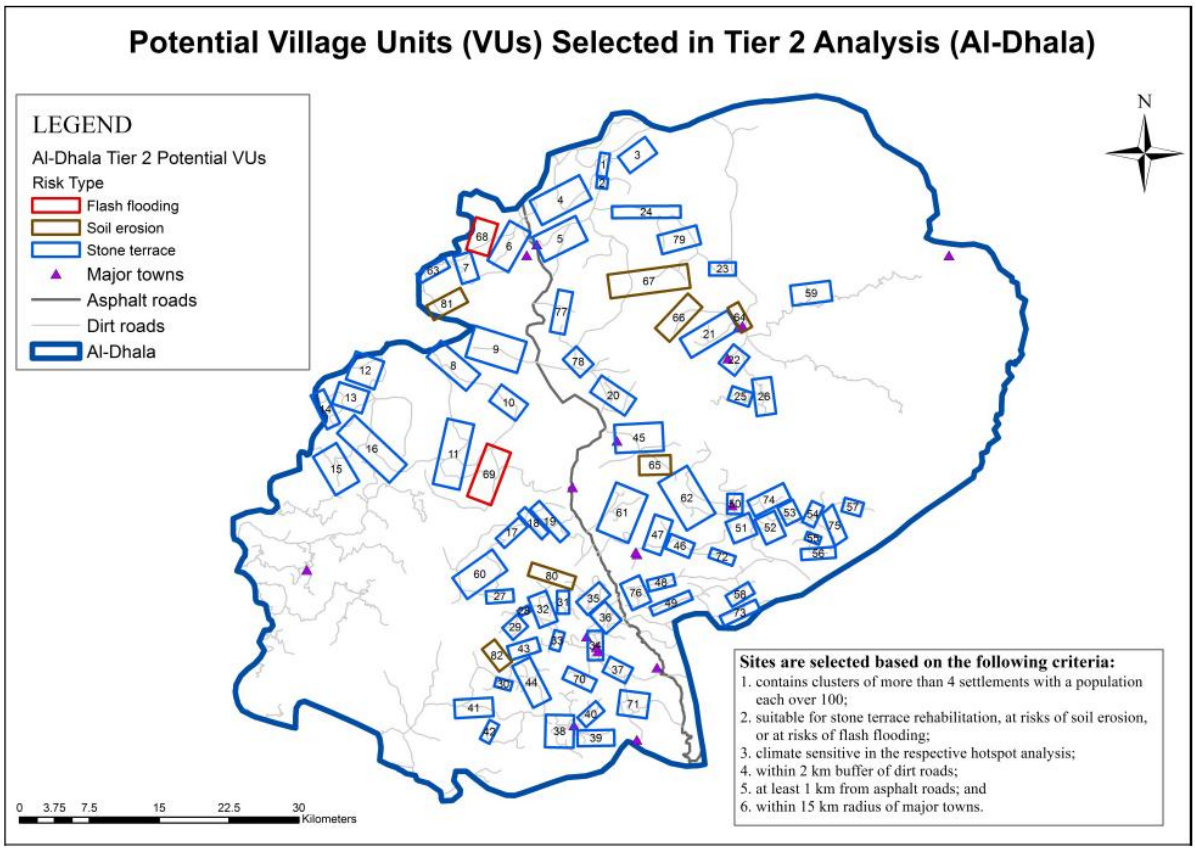
27. ***Limited knowledge and technology transfer to farmer***. Although important to improve productivity and incomes, farmers have limited access to improved technologies and inputs as well as to advisory services due to the lack of funds for operations for the agricultural extension services as well as years of neglect of these services. Production technologies as well as harvesting, storing, processing, and transportation have not been kept updated, nor are improved agronomic, business and management techniques widely disseminated. Farmers' knowledge of their land and how to farm it is generally high, but there does not appear to be a system in place to provide them with the best crop production knowledge, advice on improved techniques, market opportunities, or improved high yielding and drought resistant varieties. While there are some functioning cooperatives and associations, overall the level of organization of agricultural and livestock producers is limited.

28. ***Neglected role of women***. Women have always played an important role in agriculture, undertaking a wide range of activities relating to food production, processing and marketing. The key role played by women in agriculture is largely unacknowledged in government statistics and decision-making. Some of the important challenges faced by women in agriculture include: (i) agriculture extension and other services not provided to rural women; (ii) low level of land ownership by women, although the 2002 poverty reduction strategy acknowledges the need to improve women's access to land, no legislation has been proposed to address this issues; (iii) limited access to credit; and (iv) social norms and tribal traditions limiting women's participation in development projects, associations, cooperatives, and in directly marketing their products.

E. Profiles of targeted governorates

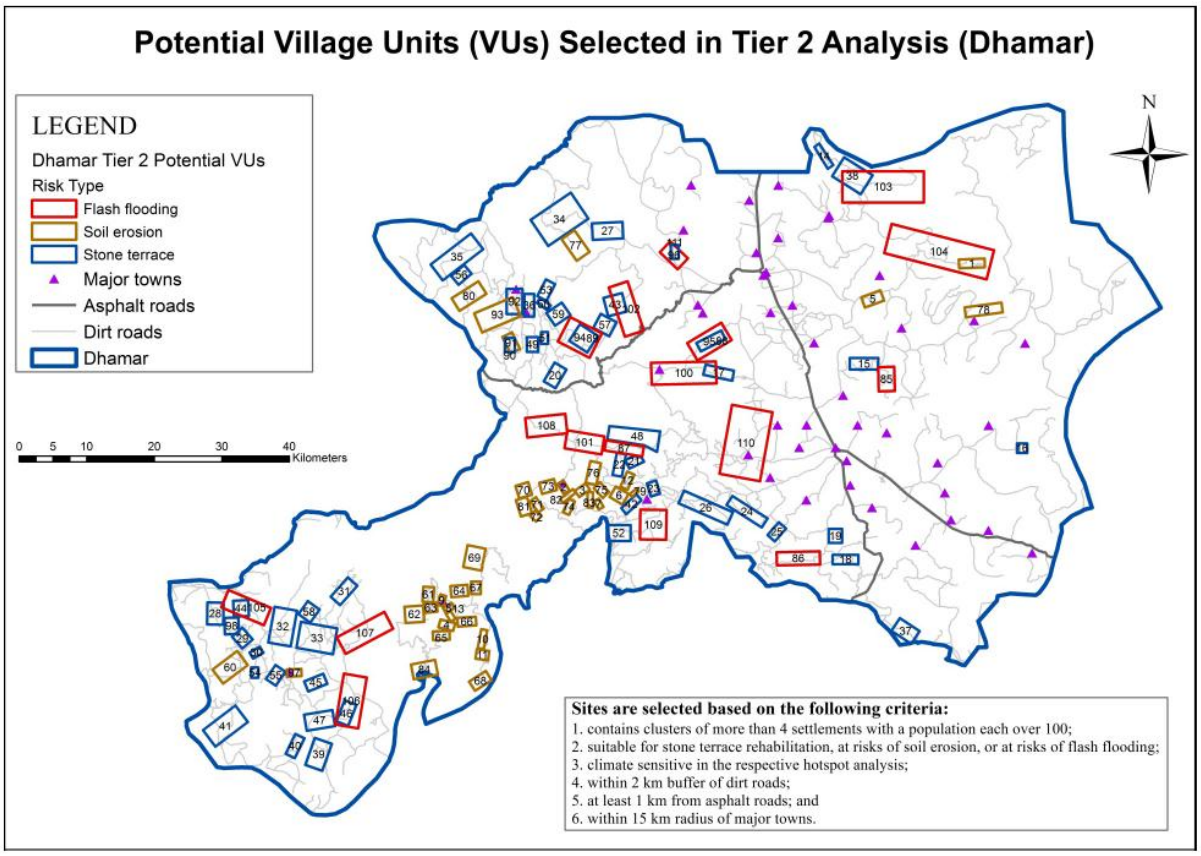
29. ***Al Dhala Governorate*** is in the mid-altitude of the country, with most of it mountainous with some plains; it is almost exclusively rainfed and has limited groundwater for supplementary irrigation. While 63% of households have access to land, the average landholding is only 0.6 ha with 61% of land exclusively rainfed, the rest benefiting from some irrigation; 48% of households cultivate their own land, 5% rent and 7% sharecrop. The main crops are also sorghum, maize and millet cultivated by most farmers, with 64% of them also cultivating some qat. Main income sources are the following: 19% of households have the production of qat as first source of income, 13% its sale, 12% agricultural wage labor, and 16% government salaries and remittances from abroad are the main source of income for only 6% of households. Here 73% of households are indebted, 54% of whom have borrowed for food purchases, and 19% for medical expenses. Households borrow from shopkeepers (51%), and family and friends (48%); 50% had been unable to buy food in the previous week.

30. The climate vulnerability assessment identified 82 VUs in Al Dhala with one or more area of vulnerability: 75 were vulnerability hotspots with regard to changes in cropping potential, 72 where there is high potential for stone terracing, 15 with a risk of flash flooding, and 28 threatened by soil erosion.



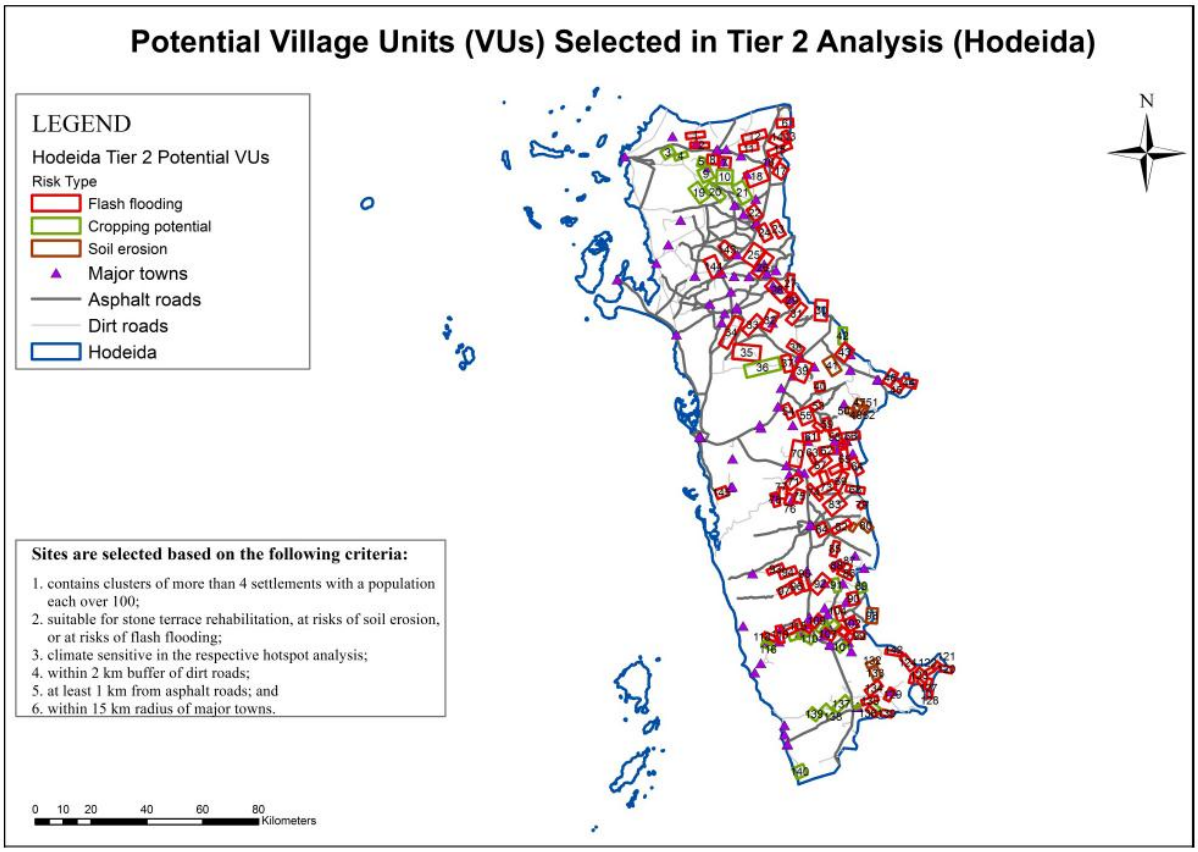
31. ***Dhamar Governorate*** has a wide range of agro-ecological conditions, ranging from the foothills of the hot Tihama plain bordering on Hodeida Governorate to the highlands with over 2000 m altitude. Half its households have access to agricultural land, with average landholdings of 0.4 ha, 76% of which is exclusively rainfed. Forty percent of households cultivate their own land while 9% work as sharecroppers and only 2% rent land. Most people cultivate maize, sorghum and wheat, while 44% have some qat. This governorate is also known for its potatoes and some other vegetable and fruit. In Dhamar production and sale of qat are the main sources of income for 10% of households, while 6% depend on agricultural wage labor and 9% on non-agricultural wage labor while 32% are primarily dependent on government salaries and 15% on services provision and 8% on remittances from abroad. A good indicator of living conditions and poverty is the necessity to borrow: in Dhamar 74% of households are indebted, including 41% for the purchase of food and 31% to cover medical expenses; people have borrowed from friends and family (68%) and shop keepers (30%). A further indicator of stress is found in the number of households who have not been able to buy food in the past week: 60% reported this as a problem.

32. The climate vulnerability assessment highlighted soil erosion as the major threat in Dhamar (94 VUs), particularly in the west of the governorate, but with a large area of high potential for stone terracing (80 VUs). There are also a number of hotpots for flash flooding (44 VUs) and a large number threated by changes in cropping potential (48 VUs). Dhamar also had the highest number of VUs identified as hotspots on all four variables (23 VUs).



33. ***Hodeida Governorate*** is located in the west of the country along the Red Sea and is almost entirely composed of the vast Tihama plain in which the country's main seasonal rivers flow. It also has some of the largest spate irrigation systems [mostly along *Wadis Zabid* and *Mawr*] which ensure good yields in the upper reaches of these river beds. With the prevailing heat and lack of rain, agriculture is very specialized and focuses on cash crops, such as bananas and mangoes. However the Tihama is also the area with the most skewed land tenure system: the majority of the fertile land is owned by a small group of landowners, either members of the current political elite or descendants of earlier ones; most of them live elsewhere. The lands are cultivated by tenants and sharecroppers as well as casual laborers, who work on very unfavorable terms. As a result the poverty rate in that Governorate is very high. In 2011, 84% of people had no access to agricultural land [CFSS 2012], while the average landholding is 1.2ha [one of only 2 governorates in the country with such a high average] but this covers the fact that there are some very large landholdings. While the main income generating activity was provision of services (20% of respondents), the next most important is government salaries [16% of respondents] followed by agricultural and non-agricultural wage labor [10% each] and remittances from abroad (8%). Here 69% of households are indebted, of whom 52% have borrowed to buy food and 26% to cover medical expenses; lenders are primarily family and friends [64%] followed by shop keepers and money lenders (29%); other sources of loans are insignificant. 58% of households had been unable to buy enough food in the week prior to the survey.

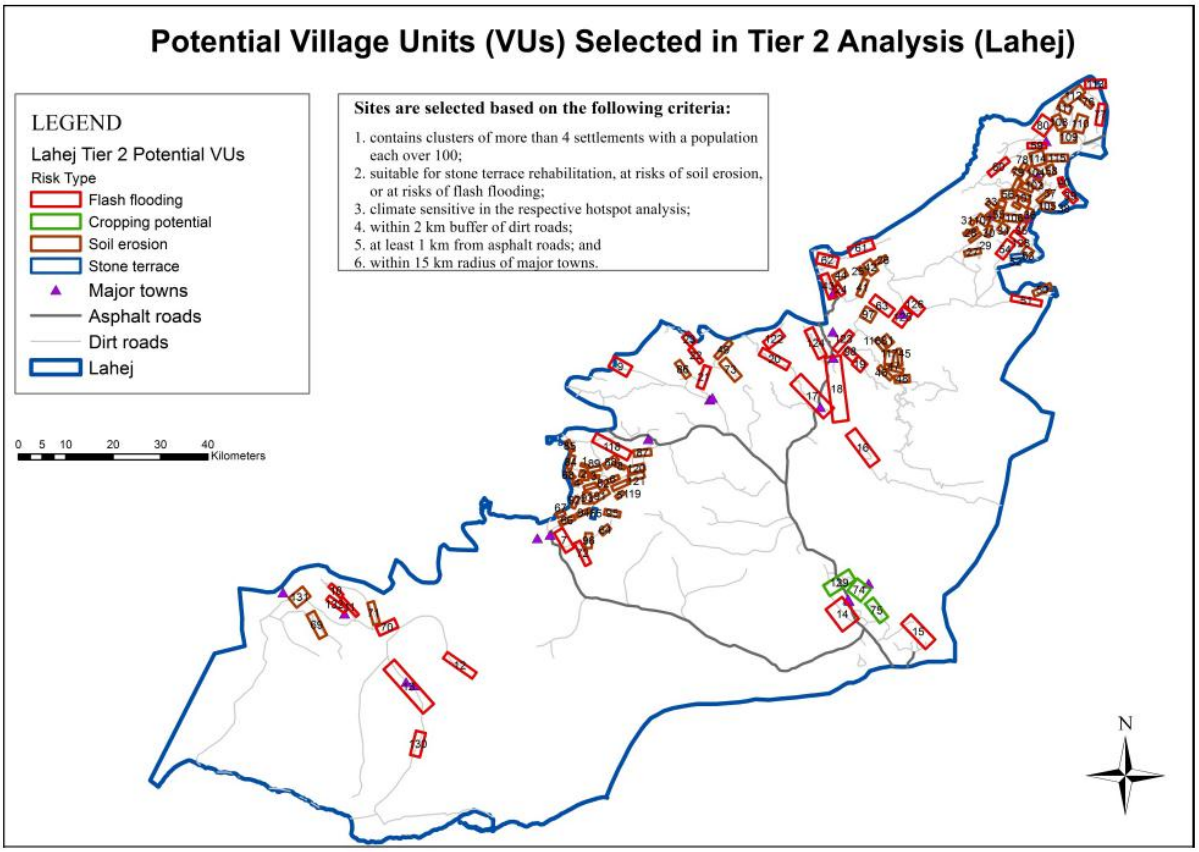
34. In Hodeidah the major sources of climate vulnerability are changes in cropping potential (136 VUs), flash flooding (107 VUs) and soil erosion (107 VUs). Given the different terrain – mainly low lying coastal plains, stone terraces are not a key concern. The vulnerability with regard to cropping potential is a major concern as the Tihama is a major area of agricultural production in Yemen, particularly high value fruit and vegetables. The majority of vulnerable locations are along the eastern border of the Governorate where the highlands meet the coastal plain and where there are the most extreme seasonal floods.



35. ***Lahej Governorate*** has a greater variety of agro-ecological zones, ranging from the coastal plain which is largely arid and lacking the regular rain-flows found in the Tihama, with only a few smaller watersheds bringing rainwater on a more irregular scale and in smaller quantities. The Lahej plain area is mainly used as grazing land for goats and occasional cultivation of sorghum/maize in small basins which have retained some water. Further east, the governorate has the spate irrigated areas of Wadi Tuban, which include some large scale diversion structures, and some middle altitude mountainous regions, in which some qat is grown alongside the usual sorghum, millet and maize on smallholdings. Overall 65% of its population have no access to land, 28% cultivate their own land, while 2% rent land and 4% sharecrop. With landholdings averaging 1.1ha, 90% is rainfed and the rest is either irrigated or occasionally benefits from supplementary irrigation. About 10% of farmers cultivate some qat. This southern governorate has been less affected by the changes in land tenure brought about by unification in 1990 than some others. While in theory most land was returned to its former landowners, in practice many beneficiaries of the land reform have stayed on their lands and are cultivating them as before. The main problem is that the rehabilitation of the large spate irrigation network has been of primary benefit to the landholders upstream and those further downstream have problems of water supply; there is practically no rainfall in their area. Immediately after unification landowners started drilling wells throughout the area in the hinterland of Aden where spate irrigation water was limited, but at low altitude. The situation is that there is considerable saline intrusion now and that the water is increasingly saline and gradually becoming unusable. With respect to the importance of income, government salary is the main one for 36% of households, followed by service provision (13% of households), remittances from abroad (12%), and non-agricultural labor (9%). Here 74% of households are indebted, 68% of whom have borrowed to buy food and 15% to cover medical expenses, mostly to shopkeepers and money lenders [66%] as well as family and friends [33%]; 54% of households reported not having had enough money to buy food.

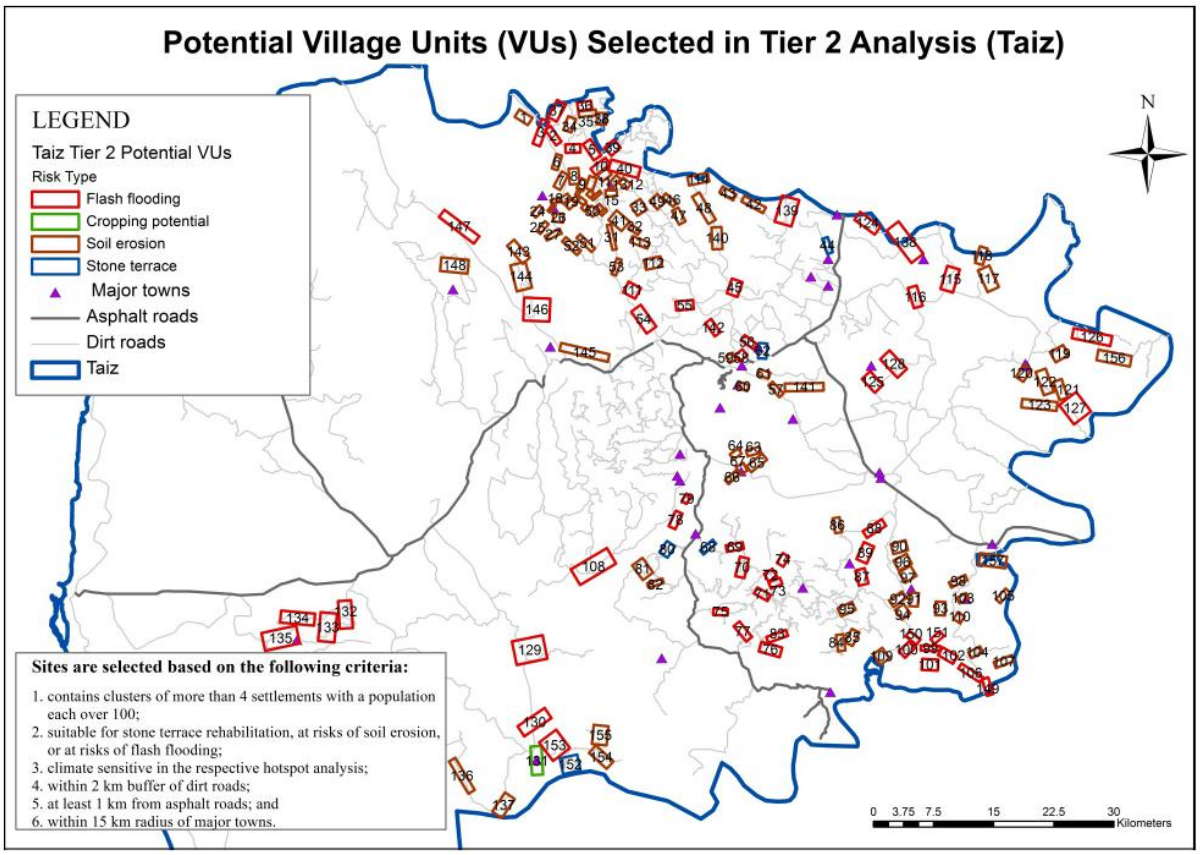
36. In Lahej the climate vulnerability assessment identified changes in cropping potential (132 VUs) and soil erosion (123 VUs) as the major threats. Flash flooding is also a concern in 43 VUs along the

main wadis where rains rush down from the highlands to the coastal plains. There is potential for stone terracing in 60 VUs in the more mountainous upland parts of the Governorate.



37. ***Taiz Governorate*** lies in the south-western corner of Yemen, around 265 km south of Sana'a. Taiz is divided into three geological areas (i) coastal in the west along the Red Sea covering Bab Al-Mandab and Al-Mokha districts, (ii) low land between the coastal and mountain and highland governorates covering Maqbaneh, Mawza and Al-Waziyah and (iii) rocky mountain and highland districts in the middle and eastern parts of the governorate covering the rest the districts. Agriculture and livestock are the main activities practised by the majority of the population. The number of farmers is Taiz governorate is 155,505 and the average landholding is about 0.4 ha. About 50% of agricultural land is irrigated and 50% is rainfed. Taiz produces cereals, vegetables, and fruits. Animal raising is the second important activity in Taiz where 209,417, 345,671, 479,007 heads of cattle, sheep, goats and camels, respectively, exist with sizeable meat and milk production. Apiculture is an important activity and source of income for landless households. Rainfed agriculture land is shrinking overtime due to expansion of irrigated agriculture of qat in mountain and highland and onion in low and coastal areas. Rainfed agriculture crops are sorghum and millet which have very low production cost and low water requirements but good returns in grain for food and forages for animals.

38. Taiz emerged with the largest number of vulnerable VUs (157), mainly in the north and east of the country, but for the vast majority the main and only threat is soil erosion (137 VUs). Smaller number of VUs are vulnerable to flash flooding (58 VUs), changes in cropping potential (30 VUs) and with possibility for stone terraces (15 VUs).



E. Transport, basic services and communication infrastructure

39. In Yemen around 50% of the total population have access to electricity, compared to a regional average of about 90%. It is estimated that 52% of small enterprises, 79% of medium enterprises and 91% of large enterprises own a generator to avoid losses as a result of the average of 192 power cuts per year. Investments in industrial activities therefore have to budget for power generation taking into account predicted declines in diesel subsidies. Mobile telephone networks cover most of the inhabited parts of Yemen, even remote areas and there are almost 8.5 million mobile phone users. Less than 20% of communities have access to safe drinking water from public water supply projects, 60% of settlements rely on unprotected springs and wells and 20% on cisterns, streams and tanks. Where available, centralized state supplies of water are erratic.

40. Yemen's roads infrastructure is relatively weak but improving: around 15 350 km of its 71 000km of road is asphalted. However it is continuously being upgraded with an additional 1 235km of road asphalted since 2008; a good road running along the entire coast from the Saudi Arabian to Omani border has recently been completed. However in country transport is expensive and phasing out of fuel subsidies which began in 2010 will result in further increases in transport costs. Industries establishing operations away from main roads have to budget for construction of feeder roads.

Appendix 2: Poverty, targeting and gender

A. Poverty

1. ***Population***. In 2012, Yemen's population is estimated at around 25 million, of which 68% (or 17 million people) live in rural areas. Although life expectancy at birth has risen to 65.5 years, the majority of the population is still extremely young, with a median age of 17.4 [HDR 2011]. With over 50% of the population under 18, and 35% aged 15-34, the issue of finding income generating and employment opportunities for the current youth bulge is a major challenge, which will not be reduced in coming years due to the population pyramid.

2. Yemen's population is still one of the fastest growing in the world, with considerable implications for the country's socio-economic development in general and children in particular. According to UNICEF [stats 2010] the population growth rate was 3.3% overall for the period 1970-1990, rising to 3.9% for the period 1990-2000 and has now dropped to 3.2% for 2000-2009. In 2012, it is estimated at about 3%. These figures are clearly compatible with what continues to be a very high total fertility rate: even though it has dropped from 8.6 children per woman in 1970 to 5.1 in 2009, this shows a low annual reduction [0.3% between 1970 and 1990 and a much higher rate 2.4% between 1990 and 2009] [UNICEF stats 2010]. Life expectancy has risen dramatically during this period, starting at 38 in 1970, rising to 54 in 1990 and reaching 63 in 2009. With about 25 million people in 2011, these factors combined mean that the population is likely to be close to 50 million in 2030.

3. Due to these same trends, it is clear that Yemen's population pyramid is very skewed towards younger people. With a total population of over 25 million in 2012, there were over 13 million under 18, and almost 5 million under 5 years old [based on UNICEF stats 2010]. 45% of the total population is under 15 years of age. Geographic distribution of the population is clearly related to the availability of natural resources and the ability of households to earn a living. The desert areas are almost empty and the highest population densities [outside cities] are found in the western highlands where rainfall is heaviest and rain fed agriculture is most productive. The coasts have small settlements of fisher folk. While urbanization has increased rapidly in recent decades, it has now barely reached 30, still leaving over 70% of the population rural. Urban growth was 5.5% per annum between 1970 and 1990, rising to 6.2% between 1990 and 2000 and dropping to 4.8% in the decade 2000-9.

4. ***Human Development***. Yemen ranks 154th in the UNDP's Human Development Index with a value of 0.462, compared to the Arab states average of 0.641, and a Gini coefficient of 37.7. According to the UNDP Human Development index 2011, i.e. based on data prior to the crisis of 2011, over 11 million people or 44.4% of the population were already living in poverty with 32% living in severe poverty. Only 32% of the population had access to clean water and 26% to sanitation, while 28% of the population used modern fuels. Over 32% of the population lived on degraded lands. Overall perception of well-being was rather low, with a value of 4.4 out of 10.

5. ***Employment***. Official unemployment rose from 12.0% in 2000 to 16.5% in 2006 and to around 25% in 2013. The low labor force participation rate (42%) suggests that real unemployment is much higher and underemployment is a major problem in rural areas, especially for youth, with much employment being on a casual basis with businesses owned by extended family members. Unofficial data show unemployment reaching 35% with a peak up to 60/70% in rural areas. Graduate and youth unemployment rates are above 60%. Age groups 15-24 and 25-39 are particularly exposed to unemployment with respectively 52.9% and 44.4%. Field visits and meetings with rural communities in the programme area during the design process have confirmed these estimates. Although women are increasingly joining the labor force to counteract declining real household incomes, the official labor force participation rate of women over 15 years of age remains low at only 19.9%; of the total population in full-time employment just 8% are female. Women of course have many duties and responsibilities which are not considered work and for which they receive no financial compensation.

6. ***Poverty***. Poverty in Yemen has been increasing in the past decade. After a reduction in the first half of the last decade, reaching a low of 34.8% in 2006, poverty increased again due to a number of

factors. According to the WB and IFPRI (2012) it reached 42.8% in 2009, a figure widely considered an underestimate at the time, due to the financial crisis and food and fuel price crises, and has now risen to 54.4% (IFPRI 2012), as a result of the economic disturbance caused by the 2011 revolution during which most economic activity ground to a halt due to a combination of insecurity and collapse of electricity and fuel supplies. As a result the vast majority of the rural population, largely dependent on diesel for irrigation and the labor of men in the towns [mostly in building and services] found themselves without income. The very limited support provided to an equally limited number of poor households by the Social Welfare Fund was inadequate to compensate for loss of income resulting from the crisis and, as a result, poverty increased very significantly. About 18% of the population live below the international extreme poverty line of US$ 1.25/person/day. All sources agree that many more people are liable to fall into poverty should any additional problem occur, i.e. droughts, floods, other natural crises, or further price rises

7. ***Food Security and Nutrition***. A major indicator of poverty is the percentage of household expenditure going on food, the poorer the people, the higher the percentage. For rural Yemen, in the 2005/6 Household Budget survey, overall 45% of household expenditure went on food, while in urban areas it was 29%. The poorest governorates had the highest percentage expenditure on food: al Baidha, al Jawf, Hajjah, Hadramout, Hodeida, Mahweet, Amran all had over 45%. The Comprehensive Food Security Survey (CFSS 2010) points out that imports cover over 80% of total food requirements, leaving the country extremely vulnerable to international market price volatility. With 96% of the population net food buyers, price is the main factor affecting levels of consumption for the poor.

8. A recent WFP study found that 61% of Yemeni children under five are malnourished (compared with 57.9% in 2006). Overall 51% of the rural population are food insecure [WFP 2012] as a result of the combination of crises which affect the population: (i) recurrent droughts; (ii) rises in price of basic food commodities as well as of fuel; (iii) drastic reduction of income generating opportunities; (iv) political and security crisis in 2011/12, and (v) shortages of electricity reducing enterprises' ability to operate. The highest levels of food insecurity are found in the dry highlands [47%] and the temperate highlands [57%]. Food insecurity is exacerbated by the following factors which lead to higher levels of food insecurity: (i) size of households: smaller households are more food insecure than larger ones; (ii) women-headed households; (iii) uneducated households; (iv) households whose main sources of livelihoods are welfare of family support and dependence on wage labor; (v) poorer households, and (vi) households in debt for food items.

B. Gender and youth

9. ***Women***. Yemen's position in the gender index is a tragedy, holding the 146th and last position in the UNDP classification, with a value of 0.769. Yemen still has a maternal mortality rate of 210/1000 and a very high adolescent fertility rate of 78.8. Women hold 0.7% seats in parliament and only 7.6% of young women have achieved secondary education, while only 20% of women participate in the labor force. While the Total Fertility Rate is claimed to have dropped to 4.9 in 2011, the contraceptive prevalence rate is only 28%. [HDR 2011]

10. Women's illiteracy levels are still exceptionally high by international standards [at 77 %] and the fact that only 63% of school age girls are enrolled in primary school and have a very high drop-out rate indicate that the problem of adult female illiteracy is not about to be eradicated.

11. Malnutrition of women and children is high in Yemen. In 2009, 51% of non-pregnant women suffered from anemia. The CFSS 2009 (p 79) found 25% of women acutely malnourished, with no notable improvement since 2003. The main factors causing malnutrition are poverty, inadequate diets, lack of access to safe drinking water, inadequate sanitation, low access to health facilities and low education among women.

12. **Youth.** Almost 80% of the population is under 35 years old. With overall low levels of education, the situation of youth employment and opportunities is a major challenge. Overall the population have

an average of 2.5 years of schooling [HDR 2011]. Young people's overall level of qualifications and training are very low. Despite the construction of many vocational training institutes, very few students graduate, and among the thousands who graduate annually from the universities, few find employment suggesting that a focus on investment in job creation and improved labour market intermediation is needed rather than untargeted training. Rural youth in particular remain largely uneducated or with very low levels of education, and very few girls reach any reasonable educational standards.

13. **Challenges** concerning the integration of youth in the national economy are the following: (i) very large number of entrants in the labor market annually; (ii) low level of skill of these entrants resulting from low educational standards; (iii) limited opportunities in all sectors: with agriculture having mostly small holdings and insufficient openings for casual labor, few industrial institutions most of them being in larger cities, civil servant recruitment being theoretically frozen, and the services sector unable to absorb more than a minority of entrants; (iv) limited migration opportunities; (v) poverty preventing many from furthering their education; (vi) little attractiveness of educational establishments due to the high level of unemployment of graduates, and (vii) discouragement.

C. Rural livelihoods

14. **Dimensions of Rural Poverty**. Yemen is still an overwhelmingly rural country. However nationally, 44% of rural households have less than 1 ha and 40% of rural households are landless with 25% of these landless livestock owners (a further 10% are estimated to be fishermen and 5% government employees or involved in some kind of off-farm income generating activity). This limited access to land means that even with dramatic increases in agricultural productivity most smallholdings are simply too small to provide sufficient income. Combined with the very limited presence of micro and small enterprises in rural areas, the vast majority of rural families are largely dependent on the income obtained by their younger males from casual labor in towns and cities each year. Over the past decade urban casual labour has become the major source of income for increasingly large numbers of rural households. While male casual labor is usually a first step in rural-urban migration of the whole household, cultural factors as well as urban costs of living and housing conditions are slowing the process of urbanization in Yemen.

15. **Typology of Rural households**. Rural Yemen has a variety of types of rural households, some of whose characteristics are shared. Common characteristics of rural households in Yemen are: (i) relatively large size usually including three generations; (ii) part-time absence of young adult males working in the cities and sending remittances home; (iii) involvement of most male and female adults in agriculture and livestock husbandry; (iv) limited access to drinking water or electricity; and (v) living mostly in solid stone or brick houses. Women play a major role in household economy, doing much of the work in cultivation as well as almost all animal husbandry activities.

16. Around these common characteristics, the following typologies can be defined according to main variations in the household asset base and livelihood. Whilst some households might not fit easily within one or another of the categories these 5 typologies are relatively comprehensive:

- **Comfortable Households (a minority in their community, c. 5% of households)**:
  - **Physical Assets**. These households own a reasonable amount of land [either over 5 feddan rainfed or over 3 feddan benefiting from reasonably reliable spate irrigation, or 2 feddan of irrigated land]. They have cattle [1 cow in highlands, maybe 3 in the Tihama] as well as 20 or more small ruminants. They would cultivate some high value cash crop, most likely qat. They would have a vehicle which might also be used to generate income as taxi service to a local market, and might also own a generator which provides electricity to other village households.
  - **Human/Social Assets**. They would have at least one adult male working on a reliable government regular salary [civil service or military] and may also benefit from remittances from a relative abroad. They would send all their sons to school and even possibly to secondary and tertiary education as well as their daughters to primary school [and

possibly secondary school if nearby or willing to allow them to live with relatives in the towns]. Such households are likely to include influential and powerful villagers and may include the shaykh, or other recognized authority. Their priority is to ensure continued well-being of the extended household and this include strategies designed to ensure continuation of their influence within the community. This may involve either a predatory approach to external resources or, on the contrary, efforts to retain support of other villagers through support for assistance to the poorer and less privileged within the community. With respect to opportunities, their position gives them a higher likelihood of obtaining employment and advantages, however the size of the household and expansion of the younger generations are challenges, given the limited resources particularly land. Such households can be a major support to the programme, provided they can be persuaded that increasing well-being of all the villagers, including the poorer, would enhance their status rather than reduce it.

- **Households just above poverty (considered average, c. 30% of households)**:
  - **Physical Assets**. Such households own smaller land areas [3 feddan rainfed, 2 feddan with reliable spate or 1 feddan irrigated]. They might have one cow and less than 10 small ruminants. If they have irrigated land or high rainfall, they would cultivate qat, otherwise they would cultivate staples or in the highlands might have some fruit trees. Should they have a vehicle, it would be very old and be used as an income generating item, but they are unlikely to have a generator.
  - **Human/Social Assets**. They would have one adult male permanently employed in government or the private sector, but no remittances from abroad. Income would come equally from their crops and from the remittances from their urban worker. They would send their sons to school, possibly up to secondary level, and at least some of the daughters to primary school, but would not be able to afford to send them to live in town for secondary education. Their main livelihood system is a combination of cash from wages [locally in agriculture and from men in the towns] and cultivation and livestock. They would be able to finance basic expenses in education [uniforms, books] and health [basic consultation costs and limited quantities and quality of medication]. Their main strategy would be to increase income, mainly through additional employment in towns and they would actively seek to obtain government employment for younger men, which would be perceived as the main opportunity. The main challenges faced would be retaining an acceptable living standard and they would fear a deterioration of living conditions through any number of possible shocks, ranging from climatic to personal health or other. Such households would be expected to take a leading role in participating in programme activities, seeing the programme's potential to assist them in improving their living conditions.
- **Borderline Households (considered average, c. 30% of households)**:
  - **Physical Assets**. These households either own a very small amount of rainfed or spate irrigated land [under 2 feddan], or work as sharecroppers or tenants on larger areas [up to 4 feddan]. They would have a few ruminants but no cattle, nor would they be cultivating qat. They would not have a vehicle but would buy electricity from those with a generator or from the network to operate lights and TV, possibly also a refrigerator [the latter particularly in lowland hot areas].
  - **Human/Social Assets**. They would have one or two men in the towns and cities seeking casual labor employment and finding work for about 15 days a month, but no regular salary. They would send their sons to primary school but not beyond as they would expect them to start trying to earn as soon as possible; they are unlikely to educate daughters unless they are particularly enlightened about the value of girls' education. These households would also be seen as average by other community members, with a similar livelihood system based on a combination of wage labor and cultivation and

livestock. Their ability to finance basic expenses in education and health would be weaker and their sensitivity to shocks greater. Their main strategy would be to try and increase their income and develop a higher level of income security allowing them to address daily expenses with greater confidence. The highest ambition would be to have a household member join government service, but this would be unlikely. Their main challenge would be to keep above the poverty line and ensure adequate nutrition, clothing and other basic needs for the family. They are likely to drop below the poverty line at the slightest hint of a shock, whether natural or human. These households are trying hard to improve their conditions and would be a primary target group for programme interventions.

- **Households below the poverty line (considered poor, c. 25% of households)**:
  - **Physical Assets**. These households are likely to own very little rainfed land or work as sharecroppers or casual laborers in agriculture. They might have 10 or less small ruminants, whose health is weak. They might have a donkey for water carrying and might be able to pay for a light or two in the house but are less likely to have a TV.
  - **Human/Social Assets**. They would not have an adult male in the cities and might feel compelled to send a male child to work in towns to provide some income. They would try and send at least one son to school, but no daughter. Women headed households are likely to be within this category. The more generous among the wealthier in the village would try and give them some assistance. They are likely to have limited vision of opportunities and would seek any kind of local opportunities to reduce their vulnerability and rise above poverty. Even without any shocks they are likely to be hungry and unable to ensure adequate nutrition to all household members. These households are clearly part of the programme target group, but might be unable to participate due to the difficulties of their circumstances and the fact that wage labor would be a priority over training and learning, as well as lack of confidence to consider developing their own micro or other enterprise.
- **Destitute households (considered very poor, c. 10% of households):**
  - **Physical Assets.** They would be landless and might own one or two small ruminants. Their household assets would be extremely limited and even their housing is likely to be of inferior quality.
  - **Human/Social Assets.** There households would usually have a particularly high dependency ratio with few adults able to work either as casual laborers in agriculture or elsewhere. Some of these households might be composed primarily of older people and they would also be of smaller size than average. They would be very dependent on charitable and other support from relatives and neighbors. Those households with children are unlikely to have the funds to educate them. Their main challenge is to ensure basic survival and they would be unable to sustain any but the most essential expenditures, and their primary ambition would be to eat an adequate diet and be able to educate their children as well as pay for medical expenses and adequate clothing. Those households including younger adults might be able to participate in some programme activities.

17. **Vulnerability context: shocks, their effects, coping mechanisms**. The most recent data on vulnerability from the CFSS 2012 clearly shows the impact of the 2011 crisis on the daily life of most households: 33% of rural households are often concerned about their ability to provide enough food and 25% are often unable to eat preferred foods. The main shocks which affect rural Yemenis are: high food prices [66% of households], high fuel prices and lack of rainfall (7% each), and high levels of indebtedness (5%).

18. Families have developed a variety of coping strategies to address poverty and in particular to deal with the unpredictability of the weather. For an average poor rural household, the main coping strategies to address worsening economic conditions and shocks are the following:

- Subsistence production of cereals and legumes and the sale of crops, particularly cash crops such as qat and coffee;
- Animal production for sale is a major coping strategy for the poor even the landless;
- In-country migration and casual labor;
- Borrowing, in order of priority and potential, first from relatives, then from friends, local shop keepers and others further away;
- Appeal to charitable individuals or organizations;
- Reduction of quantity and quality of food consumed: first meat and fish are given up, then fruit and vegetables and finally pulses. The most destitute survive on bread and sweet tea;
- Final strategy to address poverty and emergency food and other needs is to sell family's assets, starting with their land and finishing with their household consumer durables.

19. The 2011 crisis has worsened poverty significantly due to the fact that most standard coping strategies, in particular income from casual labor, ceased to be available. While droughts have always been a feature of life, it is only recently that their frequency has been such as to make it exceedingly difficult for people to cope in the above usual ways.

D. Targeting and Gender mainstreaming

20. **Target Groups**. The programme target groups are poor rural men, women and youth in the 5 governorates covered by the programme. They will be involved in the programme through their community level associations which will give priority membership to poorer people and which will be led by 'boards' including young people, women, as well as men. All efforts will be made to address the development needs and concerns of the different social and age groups. The table below presents the proposed target population and expected number of beneficiaries. It is based upon the following assumptions:

- Population increase is 3.2% per annum since the most recent statistics.
- Number of households on basis of governorate average household size as per the Census 2004.
- Poverty ratios from CFSS 2009 [none are provided in 2012]; given developments in 2011 and international and national price rises, this can be assumed to be an underestimate of the current situation by approximately 10%.
- Food insecurity ratios from CFSS 2012.
- As selection of VUs will give priority to the poorest communities it is assumed that poverty rates in targeted VUs will be around 75%.

Table 1: RGP Target Population

Governorates	Total Rural Population		Poor Rural Population	
	HHs	Individuals	% of poor	Individuals
Al Dhala	67 113	531 463	56.3	299 214
Dhamar	205 980	1 489 233	34.6	515 275
Hodeida	307 891	1 817 668	49.0	890 657
Lahej	128 344	859 904	61.6	529 701
Taiz	372 356	2 417 637	61.9	1 496 517
Total	**1 081 682**	**7 115 905**	**52.4**	**3 731 364**

21. As discussed above, poor people are found in large numbers throughout Yemen. It is only in some specific areas producing high value qat and some other cash crops that poverty levels are slightly lower. However as most producers are smallholders, they are also mostly affected by poverty. This programme is meant to be a complementary programme to follow on the DPRDP and the ADCRMP, both of which focus in particular on poor areas of their relevant governorates. While Dhamar officially has a relatively low poverty ratio (30%), 46% of its people are food insecure and the western part of the governorate has extremely high levels of poverty; while many of these areas have been covered in the DPRDP, there are still communities which have not been included, often because of accessibility issues; however roads have been built in recent years thus making them more accessible. Al Dhala has over 50% poverty ratio and close to 67% of its people suffering food insecurity and only 100 VUs have been covered there, leaving many other areas in poverty; although the targeted beneficiaries add up to more than the official poverty rate, this is not likely to be a problem due (a) to increases in poverty, and (b) the fact that even a few people above poverty are still highly vulnerable.

22. The new governorates chosen are also extremely poor, either with very large numbers of rural poor: Hodeida has close to 800 000 people in poverty, most of whom are in rural areas and landless. Lahej has an extremely high poverty rate [57% in Lahej] and is a governorate with a very low level of urbanization. Overall, with respect to agro-economic zones, programme activities will focus on village units with reasonable economic potential [outside of qat producing areas] and high levels of poverty.

23. ***Targeting Mechanisms***. Geographical targeting will be the main targeting mechanisms, through the selection of Village Units with the highest level of poverty, with respect to all major factors affecting poverty: access to communications and infrastructure, economic development and availability of social services.

- *Poverty ratios at the Village Unit level* established on the basis of national data [SFD poverty ranking at uzla level, combined with information from the 2002 Agricultural census, and the 2004 National Population Census] which will be compared to specific poverty analysis at the Governorate level implemented by an experienced national consultant assisted by programme mobilization staff;
- *Climate vulnerability assessment* will identify hotspot locations most vulnerable to flooding and soil erosion, most suitable for stone terrace rehabilitation and most vulnerable to shifts in cropping potential. A total of 627 VUs with an estimated population of 1.15 million have already been identified and mapped of which 48 are hotspots for all variables and others which are hotspots for at least one. The vulnerability profiles of each Governorate vary and are discussed in Annex 1.
- *VU inhabitants' willingness to participate* in the programme, contribute their share [in materials, cash and management time] and work in established associations;
- *Sufficient social cohesion with the VU to ensure cooperation and avoid conflicts* [this is particularly important in some areas where housing is very dispersed and the VU may cover a large number of very small hamlets]; while conflicts may arise anytime in any community, programme staff will also be willing to try and help solve and mitigate conflicts arising after selection of a community. However the selection process should identify existing conflicts and tough decisions may have to be made to ensure that areas of existing conflict are avoided, regardless of statements to the contrary;
- Accessibility: while isolated areas are poorer, it is also important that the programme staff and contractors can actually get there or very near in vehicles; hence while good roads will not be a pre-condition for inclusion, the access tracks have to be practicable without excessive danger, and staff should not have to walk more than 1 hour to reach participating communities.

24. Overall programme implementation mechanisms will focus on increasing involvement and empowerment of poor individuals and groups within the targeted communities, giving them the

potential to develop their economic activities and increase their income which, in turn, will improve their level of participation and empowerment within the community.

25. ***Women's Empowerment and Gender Strategy***. Women's situation in rural Yemen makes it extremely difficult for them to fully participate in activities. While strong gender segregation is a feature of life in most programme areas, this by itself is not necessarily a hindrance to women's participation. However the following factors strongly militate against women's participation, let alone equal participation, in programme interventions and must be addressed during implementation:

- Extremely high levels of illiteracy which result in lack of confidence.
- Low levels of education, even for the few younger women who have been educated.
- Large numbers of children, often very young and needing considerable care.
- Heavy workload in domestic responsibilities, in particular water and [often] fuel collection, as well as in housework, cooking and child care; these take time and energy which are not available for income generating and other activities.
- Responsibility for livestock husbandry, including care for cattle [which in the 'traditional' system need to be force fed by hand, a task usually carried out by older women].
- Heavy agricultural workload during the cultivating season.
- Social restrictions which restrict their inclusion in community decision making processes; in particular qat chewing sessions are major decision-making occasions and these are sex-segregated. It will be important to work out mechanisms to ensure that women's as well as men's priorities are taken into consideration on these occasions.

26. The programme has a number of interventions designed to overcome these difficulties, as well as to address climate change impacts which are likely to magnify the above existing patterns of gender disadvantage, and ensure that women are fully included in all activities. These interventions fall into two categories: (i) reducing women's workloads; and (ii) building women's capacity and creating opportunities.

Reducing women's workloads

- Significant investment in domestic water which will reduce the time spent by women in fetching water.
- Support to micro-enterprises marketing gas [reducing the amount of time spent in fuel gathering as well as protecting the environment].

Building women's capacity and creating opportunities

- Training in gender awareness for all community members, designed to improve men's understanding of the importance of treating women as equals.
- Mechanisms in village planning which will ensure that the priorities of women are given equal attention with those of men, and that final decisions on programme-supported investments prioritize women's needs but are agreed by the entire community and do not take place during qat-chewing sessions.
- Literacy and life skills training for adult women which will enable them to read and write and thus have direct access to information [whether medical, religious or any other], as well as basic numeracy helping them manage and run their own businesses.
- Establishment of Savings and Credit groups which will strengthen solidarity between women as well as provide capital for a variety of village based micro and small enterprises.
- Technical training in animal husbandry and in crop management, thus improving their skills, confidence and even yields and consequently household food security.
- Training in a variety of skills to help them start some off-farm micro enterprises including management skills.

- Training women equally as village animal health and agricultural extension workers.

27. **Youth Strategy**. Yemeni youth suffer from a variety of serious constraints in their efforts to become economically autonomous individuals. While issues of youth un- and under employment have given rise to considerable analysis and study, the problem remains enormous. There are 8.5 million young (15-34) adults in Yemen [35%] of the population. Overall they suffer from the constraints discussed above which prevent them from achieving adequate livelihoods. Despite this they are currently major contributors to household and family survival through the income they earn in the towns and cities in their unskilled and sometimes skilled work. The programme proposes to try and contribute to a partial solution to this massive problem through the following interventions:

- Provision of training in technical and managerial skills to help young people to establish micro and small enterprises and gain employment in existing enterprises.
- Training in community organizational skills, enabling them to participate more effectively in their community decision making and to have a stronger voice and representation of their concerns among their elders;
- Support in accessing credit to finance start-up enterprises;
- Technical training in agriculture and livestock related activities, to help young people in each community to become service providers for the agriculture and livestock sector, i.e. CAWs).

Appendix 3: Country performance and lessons learned

A. IFAD Country programme

1. IFAD has supported 22 development projects in Yemen valued at USD 727.4 million, of which USD 232.9 million financed by IFAD and the rest covered by external financiers and domestic resources. It has reached an estimated 580,000 households.

2. The current RB-COSOP 2007 - 2013 indicates that IFAD's response to rural poverty challenges will focus on three strategic objectives (SO):

- SO 1: empower rural communities;
- SO 2: promote sustainable rural financial services & pro-poor SMEs development;
- SO 3: enhance rural household food security.

3. The ongoing country programme includes five projects: the Al Dhala Community Resource Management Project (ADCRMP); (ii) Rainfed Agriculture & Livestock Project (RALP); (iii) the Economic Opportunities Programme (EOP); (iv) the Fisheries Investment Project (FIP); and (v) the Rural Employment Programme (REP). The ADCRMP and RALP are both focused on rainfed agriculture and livestock, area based participatory rural development and rural infrastructure. The EOP, FIP and REP are focusing, respectively, on pro-poor agricultural value chain development (coffee, honey, and horticulture), sustainable fisheries resource management and value chain upgrading, and the creation of sustainable rural employment opportunities through provision of financial and non-financial services to SMEs with market growth and employment generation potential. The EOP, FIP and YIREP are managed by the Economic Opportunities Fund (EOF); a public-private partnership created under the EOP. The RALP is managed by the Social Fund for Development (SFD) and supervised by the World Bank. The ADCRMP is managed by a semi-autonomous PMU with the Ministry of Agriculture and Irrigation as the Lead Project Agency. The Dhamar Participatory Rural Development Project (DPRDP) and Community-Based Rural Infrastructure Project (CBRIP), which, along with the ADCRMP are being scaled up by the RGP, both completed and closed during late 2012 – mid 2013.

Table 1: IFAD-Yemen 2010-2012 Country Programme

Project	Executive Board	Signed	Effective	Costs and Financing					
				IFAD	IsDB	EU	WB	Local*	Total
Al Dhala Community Resource Management Project (ADCRMP)	Sep. 2004	Mar. 2005	Feb. 2007	14.3	-	-	-	8.65	22.95
Rainfed Agriculture and Livestock Programme (RALP)	Sep. 2007	Jun. 2008	Feb. 2009	16.5	-	-	21.3	5.97	43.77
Economic Opportunities Programme (EOP)	Apr. 2010	Jun. 2010	Dec. 2010	12.9	10.5	9.7	-	5.5	38.6
Fisheries Investment Project (FIP)	Dec. 2010	Nov. 2011	March. 2012	9.1	13.3	5.3	-	5.2	32.9
YemenInvest Rural Employment Programme	Dec. 2011	Nov. 2012	Feb. 2013	9.1	21.3	-	-	17.8	48.2
Total 2010-2012				**61.9**	**45.1**	**15**	**21.3**	**43.12**	**186.4**

*Local includes Government, beneficiaries, private investors, financial institutions and the EOF

B. Portfolio performance

4. The country portfolio review undertaken in June 2013 resulted in the upgrading of the performance assessment of many aspects of the ongoing projects from moderately satisfactory to satisfactory, while no downgrades were imposed on any of the ongoing projects. This positive assessment reinforces evidence from the recent rapid increase in disbursement that overall portfolio performance is satisfactory and continuously improving. As mentioned above implementation of the

EOP has encountered some delays as a result of political instability but has made significant progress on institutional objectives.

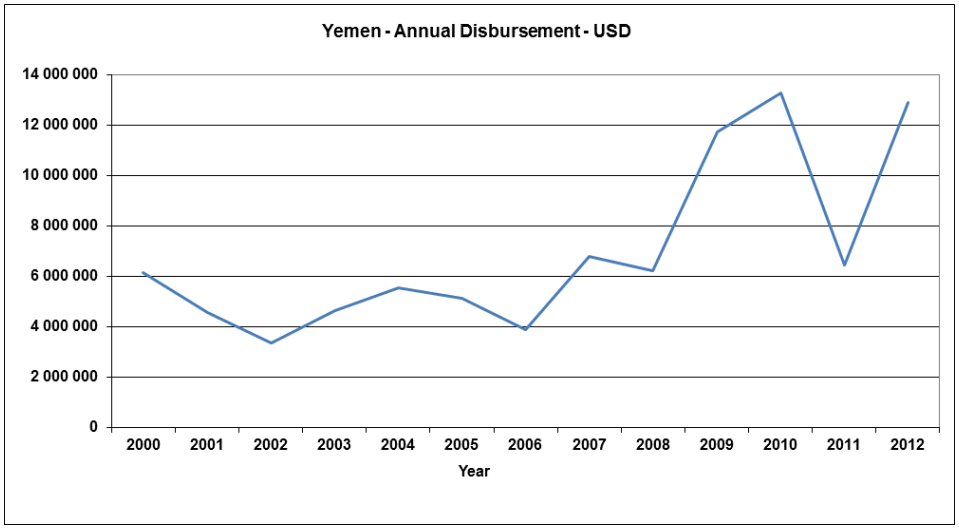
Table 3: Summary of Project Status Reports - Ongoing Portfolio

Project	PAR Value	Overall Assessment			
		Physical/Financial Assets	Food Security	Overall Implementation Progress	Likelihood of Meeting Objectives
DPRDP	Completed	5	5	5	5
ADCRMP	Not at risk	4	4	5	5
CBRIP	Completed	5	4	5	5
RALP	Not at risk	4	4	4	4
EOP	Not at risk-	4	4	3	4

5. A Country Programme Evaluation was undertaken in 2010 but the report has not yet been approved and submitted. The MTRs of the including the DPRDP (May 2010), CBRIP (July 2010) and ADCRMP (October 2010). The MTRs found the projects to be generally good and well-managed, well suited to the challenging social and physical environment and with potential to change the food security and income generating capacity of many households through increased agricultural productivity, access to finance, basic infrastructure and improved water supply and community empowerment. Significant achievements had been made in meeting institutional objectives, building trust with local communities, mobilizing and empowering community groups and establishing savings and credit groups. Weaknesses included M&E, targeting, quality of civil works in some cases and failure to follow a market-demand driven, value-chain approach to developing income generating activities which led to limited success in this area. Efforts are currently underway to reorient implementation of such activities to follow the value-chain approach of the projects developed under the 2010-2012 country programme. These lessons and others have been integrated into the following section on lessons learned. No formal supervision of the Economic Opportunities Programme has yet been undertaken.

6. Despite the political instability in Yemen since 2011, programme implementation has continued, though there were some disturbances during 2012 as reflected in the sharp decline in disbursement. However implementation rebounded impressively in 2012 as projects sought to make up for lost time and several of the newer projects moved into full implementation. As can be seen below overall disbursement performance has increased sharply since 2008.

Figure 1: Annual Aggregate IFAD Loan/Grant Disbursement to Yemen, 2000 - 2012



7. In terms of the portfolio performance in contributing to IFAD 9 priorities of outreach and cofinancing performance has been strong.

- ***Cofinancing***. While the ADCRMP had no external cofinancing and the RALP is a World Bank initiated project cofinanced by IFAD, performance in leveraging cofinancing improved dramatically during the 2010 – 2012 PBAS cycle. Combined the EOP, FIP and REP included an IFAD contribution of US$31.1 million which has leveraged cofinancing from other donors amounting to US$ 60.1 million (IsDB and EU), and contributions of US$ 28.5 million from local sources (government, participating financial institutions, private sector investors and beneficiaries). With regards to international donors' contributions, both EU and IFAD are in the form of grant while IsDB contribution is in the form of a highly concessional loan. Since beginning implementation the Saudi Fund for Development have provided an additional US$ 5 million in cofinancing for the EOF and several other donors have expressed interest in providing additional cofinancing. The RGP design process has been the most successful to date in terms of cofinancing, building on the partnerships developed since 2010.
- ***Total Outreach***. The total outreach of IFAD-financed country programme includes: ADCRMP – 15,600 HHs, RALP – 185,000 HHs, EOP – 14,540 HHs, FIP – 48,790 HHs, YIREP - 28,670 HHs for a total of 292,600 HHs, or approximately 2 million individuals. The addition of the RGP will increase the outreach to approximately 3.2 million individuals or almost 20% of the rural population.

C. The knowledge base lessons from previous/ongoing projects

8. The operational experiences of Government and financiers including IFAD in Yemen have generated lessons which have been considered in the Programme design and execution. The key lessons of relevance considered in the design are outlined below:

- ***Rural infrastructure***. Weak infrastructure is a major constraint to the development of dynamic rural economies. Construction of access roads is essential to facilitate and encourage investment in rural areas and can have a transformative effect on rural communities, particularly for women. Roads construction using local materials, local labor and community contracting is a relatively low cost and effective solution to infrastructure needs in remote mountainous areas. The effectiveness of participatory processes for rural roads development and maintenance has been well demonstrated by the CBRIP. The importance and utility of community infrastructure, particularly drinking water, as an entry point for a programme to engage and build trust with communities in remote areas should not be underestimated.

- ***Eligible activities***. Projects should provide assistance, support, investments and services to communities on the basis of their demand formulated in Community Action Plans. Projects should assist communities to liaise with the appropriate public/private sector institutions when their demands are off-project limits. Projects should strengthen the capacity of communities to elaborate Community Action Plans that include demands related to non-productive and productive activities. The higher the quality of the Community Action Plans, the easier to finance them through other public/private sector institutions or projects.
- ***Project management and staff***. The quality and motivation of project management and staff is a key factor in project performance. Relatively independent PMUs, managed by staff selected on a competitive basis and committed to participatory approaches and gender mainstreaming have proven to be the most effective.
- ***Community participation***. Community involvement in planning and implementing development projects from the outset is essential for their success, future ownership and sustainability. The ADCRMP, DPRDP and CBRIP are recognized as models for community driven development in Yemen and similar approach has already been implemented outside the sphere of these programmes. Appropriate guidance during participatory planning process by trained facilitators is a key factor of success for project activities.
- ***Community-level organizations***. Enthusiasm for community-driven approaches to development has been successfully demonstrated in the ongoing programmes. Appropriation by well-trained communities of their Community Action Plans, infrastructure and productive investments is a guarantee for long-term sustainability. Community–level organizations should be developed with a simple mandate and single purpose to avoid confusion. All community-level organizations should be then supervised by a Community Development Association that would ensure the inclusion of every household of the community and a harmonized implementation path among all activities.
- ***Sustainability***. Decentralized PMUs tying up relationships with the governorate-level network of local administration, SMEs, service providers, and producers' associations have proven to facilitate the maximization of projects impact and benefits to a wider population than the projects' target one. PMUs gradually included in the governorate-level Agriculture and Irrigation Office increases chances for sustainability and improvers coordination with governmental policies. Legal registration of Community Development Associations (CDAs) under the Civil Associations Law gives community associations the greatest capacity to act effectively to support development in their communities by allowing them to engage with and accept funding directly from any local official entity, non-official entity, or foreign entity.
- ***Conflict resilient implementation arrangements***. Arrangements which increase ability to continue programme implementation during periods of political crisis include: (i) decentralized PMUs which are not embedded within public organizations; (ii) extensive use of private sector service providers and community contracting, and (iii) investment activities in rural areas.
- ***Financial services***. Access to appropriate financial services by the rural poor is essential for adoption of improved technologies and establishment of micro-businesses in rural areas and fundamental for economic growth and poverty reduction. The current urban focus of the banking sector constrains the delivery of financial services. SCAs are effective, low cost, and popular mechanisms to provide access to basic savings and credit products in rural areas. However effective mechanisms for linking SCAs to microfinance institutions are required for longer-term sustainability and access to larger amounts of credit. In addition, linkage with microfinance institutions will also facilitate graduation mechanism of most successful clients requiring large loans than SCAs can extend. Finally, to facilitate sustainability of rural activities financed, grants are an unavoidable element without which profitability and impact on entrepreneurs' income cannot be fully reached.
- ***Targeting***. Territorial approach to the lowest possible community level will ensure the inclusion of all households of the communities in the projects activities, including the poorest households.

Non-financial services should be provided to all members of the communities while financial services should be extended to economically active poor with bankable projects which will lift up the other members of the communities. It is preferable to ensure inclusion of the poorest rather than exclusion of the slightly better off. Earmarked co-financing is a valuable direct targeting tool for specific priority target groups. Value chain approach and financing have also proven to be an efficient way of increasing income of poorest households by including them in structured value chains securing their access to improved inputs and markets. Community Development Associations' governing bodies should be composed of representatives from the various strata of the community to ensure their effective inclusion in all projects' activities.

- ***Women's empowerment***. Certain investments have a positive impact on women's empowerment as the incremental spare time gained can be used to develop income-generating activities or to attend literacy classes, life-skills and technical/managerial training. Specific activities targeting women (WSCAs, income generating activities, training, agriculture and livestock activities) will ensure social and financial women empowerment.
- ***Climate-change resilience and social impact***. For sustainability in both the short- and long-term, negative environmental and social impacts of development activities must be avoided. This requires rigorous ex-ante assessment of the potential environmental and social impacts of project/programme activities and the development of appropriate plans and measures to mitigate environmental risks as well as the adoption of positive measures and actions with regard to climate-change resilience.

9. **Key Areas for Improvement**. With respect to the first phases of DPRDP, CBRIP and ADCRMP, it is recognized based on the lessons learned that there are a number of key areas for improvement in the RGP including: (i) strengthening linkages between Community Development Associations and local administration; (ii) ensuring financial link between Saving and Credit Associations and licensed financial institutions; (iii) promoting climate-change resilience in all activities; (iv) sustainably increasing use of improved agricultural inputs; (v) increasing focus on economic infrastructure, especially soil and water conservation measures (water harvesting and storage, spate and drip irrigation, wadi bank protection, terrace rehabilitation), while developing appropriate partnerships to support social infrastructure in targeted communities; (vi) reducing cost for infrastructure works through increased use of local materials and designs and learning from best practices; (vii) structuring value chains and ensuring inclusion of smallholders and poor households; (viii) standardizing approaches to cost-recovery across all programmes for the provision of services, and (ix) strengthening monitoring and evaluation frameworks and impact measurement.

Appendix 4: Detailed programme description

A. Programme area and target group

1. **Programme area**. The programme will support rural development and poverty reduction and increase climate resilience by scaling up successful activities implemented under the Dhamar Participatory Rural Development Project (DPRDP) and the Al-Dhala Community Resources Management Project (ADCRMP) within Dhamar and Al-Dhala governorates to reach additional communities, before expanding to Hodeida, Lahej and Taiz governorates. These five governorates have relatively high population density, substantial rural poverty, and serious food insecurity and all have large areas identified as hotspots of climate change vulnerability. The programme will expand into additional governorates as additional financing becomes available.

Table 1: Demographic and Socio-Economic Indicators for Selected Governorates

Governorates	Rural Population (#) 2012 act.	Rural poor (#) 2012 act.	Rural Poverty Incidence	Food Insecurity
Al-Dhala	531 463	299 214	56.3	56.6
Dhamar	1 489 233	515 275	34.6	46.1
Hodeida	1 817 668	890 657	49.0	33.3
Lahej	859 904	529 701	61.6	58.0
Taiz	2 417 637	1 496 517	61.9	56.9
Total	**7 115 905**	**3 731 364**	**52.4**	**50.2**

2. **Target groups.** The programme's target group will consist of poor food insecure rural households living in selected communities with a specific focus on women and youth[24]. However, other households will also benefit from the programmes investments in public goods and civil works such as roads and community schemes for drinking water. Transparent targeting procedures, based on mechanisms applied by ongoing projects will be implemented. Efforts will be made to ensure the involvement of women in decision-making and leadership positions in community organizations. At full development, the programme is expected to directly benefit around 1.2 million individuals, of whom around 0.8 million live below the poverty line (table 2).

Table 2: Target Population and expected beneficiaries

Governorates	Total Rural Population		Poor Rural Population		Previous progr. cumul. Individuals	Remaining poor rural population	Targeted Beneficiaries			
	HHs	Individuals	% of poor	Individuals			VUs	HHs	Individuals	Poor Ind.
Al Dhala	67.113	531.463	56,3	299.214	144.760	154.454	80	25.600	202.726	144.543
Dhamar	205.980	1.489.233	34,6	515.275	121.481	393.794	80	25.600	185.088	91.804
Hodeida	307.891	1.817.668	49,0	890.657		890.657	130	41.600	245.591	157.178
Lahej	128.344	859.904	61,6	529.701		529.701	130	41.600	278.720	213.500
Taiz	372.356	2.417.637	61,9	1.496.517		1.496.517	130	41.600	270.101	207.708
Total	**1.081.682**	**7.115.905**	**52,4**	**3.731.364**	**266.241**	**3.465.123**	**550**	**176.000**	**1.182.225**	**814.732**

Source: Central Statistic Organization (2004) updated by a coefficient of 3.2 per year.

3. **Village Unit formation process**. The programme will be implemented in the poorest and most climate vulnerable districts of the five selected governorates (on the basis of the latest UNDP poverty assessment and the climate vulnerability assessments undertaken during design). To maximize the impact of programme's activities and avoid geographically scattered interventions, the programme's

[24] The national poverty line will be used as the definition of poor.

intervention unit will be the 'Village Unit' (VU) composed of around 3 to 5 settlements, each having around 75 to 100 households (i.e. around 600 inhabitants per settlement). The VU selection process will give greater emphasis to remote, mountainous areas within each district where living conditions are significantly more difficult and poverty most accurate. Agreements will be required from communities: (i) not to utilize programme support for existing qat farms or to increase the area under qat cultivation, and (ii) to establish, as required specific user groups to manage all programme constructed infrastructure and the land and water resources utilized by the VU. As explained in the following figure, the Village Unit formation process will consist of the following two steps:

- Step 1: Identification of eligible settlements;
- Step 2: Formation of Village Units.

Figure 1: Village Unit formation process

Actions	Village Units Formation
Methodology	(a) Participatory Poverty Mapping undertaken by the Programme (b) Field visits (c) Verification of PPM's results with existing data (GoY; UNDP; IFAD-financed-programmes)
Eligibility Criteria for Settlements	- No asphalted access road - Not targeted by another donor/project offering similar support - Avg. household plot size < 0.5 ha - Social cohesion: existence of operational associations or willingness to operationalize/form associations and special interest groups - Consent to prioritise poorest households in Programme implementation - Commitment not to utilise programme support for existing qat production and to not to expand qat production
Responsibility	PMUs Gender and Community Development Specialists, Field Managers and Community Facilitators assisted by local TA
Steps	(a) Identification of eligible settlements (b) Formation of VUs of +/- 300/350 HHs based on 3-5 eligible settlements within 1 *uzla*
Outcome	List of VUs: (a) 80 VUs formed for both Dhamar and Al-Dhala governorates (b) 130 Vus formed for Hodeida, Lahej, and Taiz governorates

4. To ensure adequate targeting of the most climate vulnerable VUs, the identified hazard 'hotspots' in the climate vulnerability assessment are used to identify those VUs respectively: (i) most suitable for stone terrace rehabilitation; (ii) most vulnerable to soil erosion; (iii) most vulnerable to flood risks; and (iv) most vulnerable to changed cropping potential. This ensures that project activities address the most pressing needs of selected VUs in a comprehensive manner.

5. **Phasing of Village Units**. The following table illustrates the phasing of Village Units inclusion in the Programme considering the phasing of its expansion in new governorates. This will be done slowly in order to allow time for learning, partnership building, and adjustment of implementation approach and methodology to new Governorates. The Programme will envisage to form and support approximately 550 Village Units including 176 000 households. Each Village Unit will receive a package of intensive support to be implemented over 3 years with 1 year of additional follow up and support to ensure sustainability.

Table 3: Phasing of Village Units

Governorates	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
Al-Dhala	40	40						80
Dhamar	40	40						80
Hodeida	30	60	40					130
Lahej	30	60	40					130
Taiz	30	60	40					130
Total	170	260	120	-	-	-	-	550

6. **Phasing of activities**. PMUs will be operational in each governorate at programme inception. In all locations the initial focus will be on identification of target communities, establishment and strengthening of CDAs, development of CAPs and then key entry-point activities including domestic water supply and literacy training. NRM and civil works investments will be implemented following initial capacity building and training of the users' association which will be responsible for their management. In new Governorates there will also be a phase of training and capacity building of the PMU management and field staff.

B. Programme development objective

7. The programme's goal is to reduce poverty and food insecurity in rural areas and increase smallholder climate resilience. Its development objective is to stimulate sustainable and resilient economic growth for women and men in rural communities.

8. The programme's expected outcomes are: (i) household and community empowered to manage own development and engage in income generating activities; (ii) natural resource management improved and focusing on climate resilience, and (iii) improved, climate resilient agricultural practices and technologies adopted.

C. Detailed programme description

9. The programme consists of three technical complementary and mutually reinforcing components in addition to the programme management component: These are: (i) Component 1: Community Empowerment and Livelihoods Diversification; (ii) Component 2: Natural Resources Management and Resilient Infrastructure; (iii) Component 3: Agriculture Development; and (iv) Programme Management.

10. Within these components, the specific range of activities to be implemented in each Governorate will depend upon the specific socio-economic context, agro-ecological conditions and community demand, as captured in the CAPs. The CAPs are therefore considered the backbone for the identification and implementation of the specific programme activities. While CAPs are expected to be based upon the activities described below, the programme will consider support to other relevant and innovative activities proposed by the CDAs such as piloting alternative energy sources and new crops and cropping systems.

Component 1: Community Empowerment and Livelihoods Diversification

11. The outcome of this component is: households and communities empowered to manage their own development and engage in income generating activities. It consists of four sub-components: (i) community institutions building; (ii) women's empowerment and life-skills training; (iii) microfinance; and (iv) income generating activities.

Sub-component 1.1: Community Institutions Building

12. The programme will support the establishment/strengthening of Community Development Associations (CDAs) and CDA registration under the Ministry of Social Affairs and Labor. Registration will provide the legal and regulatory framework for CDA operations as well as for the use of

community contracting. The programme will train all members of each CDA executive committee (5-11 members) in organization and management, accounting, bookkeeping and conflict resolution, enabling them to manage implementation of development activities and to train office bearers of specific sub-groups such as water users associations. The programme will ensure that CDA executive committees include at least one-third of female members. Each community will be assisted to undertake a participatory diagnosis of their development issues and constraints. Investments and activities to overcome these constraints will be identified through a participatory process and incorporated in Community Action Plans (CAPs). A particular focus of this training will be on environmental sustainability, climate change adaptation and disaster risk management to ensure CAPs include climate risk management measures. Volunteers within each community will be trained to assist in this process.

13. The primary tasks of the CDAs will be the following:

- Prepare a Community Action Plan through a fully participatory process involving separate meetings of women, youth and adult men, ensuring that proposals of the poorest are included. The CAP will be comprehensive including communal as well as household-based activities including infrastructure investments such as access roads, drinking water and irrigation, as well as activities related to agriculture, livestock, off-farm income generating activities, microfinance support, community capacity building, and women's development.
- Participate actively in the implementation of this plan, and in particular ensure that community participation in its implementation is as high as possible from design and supervision of contractors, to actual labor provision. Labour intensive construction methods will be used.
- Represent their communities in negotiations with other institutions, whether state, parastatal or private to advocate for investment resources. The CDA will also be responsible for ensuring that CAPs are included in relevant ministries' policies and plans at both the district and Governorate levels, and that additional funds from other sources are made available whenever possible.
- Negotiate and link up with the district and governorate elected and administration staff of all relevant ministries.
- Supervise and monitor activities of interest and user groups established in each village unit for the management and maintenance of infrastructure and natural resources including rangelands and ensure they are functioning effectively.
- Conflict mitigation and dispute resolution within the VU.

Sub-component 1.2: Women's Empowerment.

14. The objective of this sub-component is to ensure that women have with the basic knowledge, skills and capacity to engage in planning and implementation of development activities in their communities and to benefit from opportunities available for income generation and employment. This will be achieved through the provision of literacy and life-skills training.

15. Two levels of literacy courses, each lasting one year, will be provided by women selected from within the communities themselves. These women will receive Training of Trainers instruction, a small, performance-based salary and all required equipment and materials. Life-skills training will be provided over a period of one year and will include core issues of concern for women and their families such as hygiene and sanitation, healthcare, nutrition, legal rights, and environmental issues.

Sub-component 1.3: Microfinance.

16. Building on the successful implementation of Savings and Credit Groups (SCGs) under DPRDP and ADCMRP, the main objective of this sub-component is to promote the creation of one grass-root level SCG in each selected VU, federated at district or governorate level within a Saving and Credit Association (SCA). SCAs will provide services to affiliated SCGs (mainly control and supervision of SCGs activities as well as capacity building of SCGs members), and will act as financial intermediaries for licensed microfinance institutions (MFIs) to which they are linked, thus

providing SCG members with access to larger resources and more diversified financial products. The linkage between SCAs and MFIs will ensure the attractiveness and sustainability of SCGs. The Programme foresees to have at least 100,000 of the target group to be members of SCGs with at least 80% of them being women.

17. Potential partner MFIs include: (a) Al-Amal Microfinance Bank; (b) Tadhamon Microfinance Unit, and (c) Al-Khuraimi Islamic Microfinance Bank. Both Al-Amal Microfinance Bank and Tadhamon Microfinance Unit want to open fully integrated new district-level branches while Al-Khuraimi Islamic Microfinance Bank wants to transform its money transfer outlets in rural areas into microfinance points of services. These MFIs want to integrate SCAs as part of their network as financial intermediaries especially in rural areas where points of services or branches will not be sustainable. Such a development will: (a) reduce operating costs for MFIs when operating in rural areas; (b) increase microfinance outreach; (c) reduce transaction costs for communities, and (d) enable rural households, especially women and youth, to finance their income generating activities and/or micro- and small enterprises, thus increasing their income and improving their livelihoods.

18. Through awareness campaigns and support from PMU field staff, the programme will assist communities to create and register SCGs and SCAs and elect their governing bodies. Support provided by the programme to SCGs/SCAs will include: (a) subsidy to offset losses so as to ensure SCAs sustainability during the first years of operations, (b) financial instruments to ensure SCGs sustainability including seed capital from the programme; and (c) training and capacity building of SCGs/SCAs' governing bodies, managers and accountants covering preparation of their manual of procedures, financial, accounting and legal management, risk assessment, roles and responsibilities of members of governing bodies, financial reporting, portfolio monitoring, credit and savings operations, and checks and balances.

19. Subject to excellent performance after the first 2 years of each SCG's operations (non-performing loans at 0%, repayment rate at 100%, portfolio-at-risk at 0%, increase in resources mobilized from members of at least 30% per year), the selected MFI will provide to SCAs additional lending resources in the form of short/medium-term revolving loans, the amount of which will be defined by the MFI based on: (i) unmet demand from SCA members; (ii) SCA capitalization; and (iii) the MFI's prudential ratios.

20. Resources mobilized by SCAs (savings, matching grants and refinancing loans) will be used to extend short and medium term loans to members (no restriction will be put on the use of loan proceeds, but SCAs will ensure that borrowing members have the capacity to pay back their loans). Loans extended by SCAs to their members will average USD 250 and repayment will be rigorously enforced.

21. Capacity building support will also be provided to SCGs and SCAs created under the DPRDP and ADCRMP. This assistance will mainly comprise of training, capacity building and review/adaptation of current procedures, accounting system, products and services proposed as well as their terms and conditions similar to that of the selected MFI.

22. It is estimated that each SCG established in a village unit (320 households) will have after 4 years around 180 members (of whom 80% should be female) and contributions from members will amount to USD 21 200 after 7 years. Seed capital provided by the Programme will amount to USD 2 400 (extended over the first two years of SCA operations) while it is estimated that refinancing lines extended annually (or bi-annually) by the selected MFI will amount to USD 4 400 per year. At the end of SCA year 7, around 460 loans will have been disbursed averaging USD 250 each.

Sub-component 1.4: Livelihoods Diversification.

23. The main objective of this activity is to promote in a sustainable manner young and women-managed farm and off-farm micro and small enterprises as well as income generating activities as a means for resilience to shocks. . Specific business opportunity analyses will be carried out by NPCU Business Development/Rural Finance Specialist to identify youth and women-focused farm and off-farm opportunities that have comparative advantage, growth potential and market demand and can be

promoted in the programme area. Main support will consist in: (a) provision of specific training in both technical and financial management to ensure profitability and sustainability - (b) matching grant (on a 1:1 basis with beneficiary's contribution).

24. The NPCU Business Development/Rural Finance Specialist will liaise with NGOs, consulting firms, training centres or institutions competitively selected by the NPCU to ensure the strengthening of entrepreneur's technical skills through appropriate training while he/she will provide the entrepreneur with financial management courses. Training will also include environmental and climate change adaptation issues provided by the NPCU Environment and Climate Change Specialist.

25. Matching grants will be extended by the NPCU from a Financial Facility for MSEs (FIFAMSEs). A FIFAMSEs Investment Committee composed of the NPCU Business Development/Rural Finance Specialist, the Governorate-related PMU Manager and the Gender and Community Development Specialist will decide on the level of grant for each investment. The grant will match the entrepreneur's contribution (which must be at least 10%) but will not exceed 30% of the total investment cost. A manual of procedures will be developed at programme inception to comply with IFAD matching grant policy. The NPCU Business Development/Rural Finance Specialist will assist entrepreneurs to liaise with a financial institution for additional financing (to avoid freezing SCGs resources for a few projects over a long period). Disbursement of the grant will be subject to: (i) entrepreneur having the necessary funds to finance the project (either own resources or borrowed funds), and (ii) entrepreneur having started to attend his/her technical skills and financial management training programme.

26. In addition, as the absence of energy is a hampering factor for developing income generating activities (such as small processing units, storage facilities, or small production units), the programme will also finance in the form of a grant the necessary energy equipment required by entrepreneurs for their activity. In that respect, the programme will promote renewable energy investments such as solar panel. Each request for an energy grant submitted by an entrepreneur will be reviewed by a specialized local engineer contracted by the NPCU. The decision of the FIFAMSEs Investment Committee to extend a grant will be based on the local engineer's feasibility study and financial projections. The energy grant, which will complement the matching grant, will be capped at USD 10,000 per project and will fully finance the necessary equipment (solar panels, batteries) and installation as well as technical assistance provided by the supplier. Communities will experience indirect benefits such as: job creation, additional services provided and additional marketing channels for the local production. In addition, suppliers and PMUs will promote the establishment of maintenance/repair shops where such solar systems are implemented.

27. It is estimated that around one-quarter of all households in each VU (around 90) will develop an IGA/MSE requiring financing up to USD 500 (averaging around USD 150) leading to at least 50,000 beneficiaries by the end of the programme. It is also expected that around 5 entrepreneurs per governorate will benefit from an energy grant.

Component 2: Natural Resources Management and Resilient Infrastructure

28. The expected outcome of this component is: natural resource management and infrastructure improved and climate resilient. Investments considered under this sub-component will focus on: (i) soil and water conservation; (ii) rangeland rehabilitation and management; (iii) drinking water; and (iv) construction/rehabilitation of quaternary roads.

Sub-component 2.1: Integrated Water Management and Soil Conservation

29. The objective of this sub-component is to support off-farm agricultural production in selected VUs through land conservation works and enhanced efficiency in water harvesting in order to restore agricultural land and increase its productivity and fertility. During the CAP development process, a number of locations will be selected as suitable sites for specific interventions. These interventions will take into consideration principles of the integrated watershed management. Interventions will be based on the extent of resource degradation, their feasibility, potential benefits and minimal risks of damage and conflict to other communities within the watershed. These interventions will be guided by

the studies already undertaken on the vulnerability of VU sites based on present and future climate change risk scenarios[25].

30. Investments considered will include medium and small surface water harvesting and spate irrigation infrastructure, reservoirs and conveyance networks up to field edge aiming at increasing security of crops during droughts and enhancing crop-productivity. Emphasis is also given to reducing water losses in irrigation schemes (water canals with cement base and covers and other structures reducing evaporation) and enhancing the efficiency of rainwater use for irrigation (improved water collection and storage). In Al-Dhala, Dhamar and Taiz governorates, water harvesting infrastructures will mainly include small and medium dams with conveyance networks up to field-edge while in both Hodeida and Lahej governorates, infrastructure will mainly be focusing on spate irrigation and conveyance networks up to field edge. Investments in small and medium dams will always be linked with the promotion of modern water-saving irrigation systems to ensure enhanced on-farm water use efficiency and increase in yields and production (see Sub-component 3.2). The programme will also include in selected VUs rehabilitation of existing water harvesting infrastructures, also complemented with promotion of modern irrigation systems. Linkages will be made with the National Irrigation Programme to assist in implementing on-farm irrigation technology.

31. Under this sub-component, activities will further include terrace rehabilitation, wadi bank protection and reforestation. The soil protected by terraces will act as natural water storage and retain soil moisture adequate for rainfed agriculture. They will also mitigate flash flood impact. In combination with terrace rehabilitation, the programme will promote reforestation activities of hillsides. Seedlings used for reforestation activities will be procured from local public or private nurseries. *Sub-*

component 2.2: Rangeland rehabilitation.

32. The objective of this sub-component is to increase rangeland productivity by improving carrying capacity and enhancing vegetation growth. Based on CAPs and on a preliminary study carried out by the Department of Forestry and Rangelands (assessing the status of rangelands in terms of carrying capacity, biodiversity, water resources and soil erosion situation in the target areas), investments considered will include reseeding of indigenous herbaceous leguminous and cereal species and perennial forage crops, micro-catchment water harvesting, as well as soil conservation and stock water provision. Seeds for reseeding of the rangelands will be procured by community members through programme-supported input supply stores, from available national seed multiplication institutions or organizations, including research centres (ICARDA or AREA), or when needed procured from neighbouring countries with similar agro-ecologies. Perennial forage shrubs will be obtained from national public and private nurseries. Since this sub-component is a community-managed pilot area, capacity building to local communities will also be provided by the programme. Rehabilitated rangelands will be managed through rotational exclusion for 1-2 years to allow for the improvement of the carrying capacity of the land. Management plans will be developed by the relevant CDA and their Rangeland Management Associations (RMAs), to be established by CFs and trained by the NPCU Environment and Climate Change Specialist as well as by the Department of Forestry and Rangelands. Resulting from the programme's interventions, community will benefit from better and sustainable grazing resources combined with an added value of quick return and environmental benefit, thus contributing to climate resilience e.g. honey production. *Sub-component 2.3: Drinking water*.

33. The objective of this sub-component is to provide communities with reliable and safe access to drinking water during the dry season. The programme will support both individual household and community drinking water schemes including roof rainwater harvesting structures, protected shallow wells, and gravity-fed springs based on sustainable use of locally available resources and more resilient to changing climatic conditions. Water user associations (WUAs) will be established to manage and maintain community systems. Based on the needs for provision of drinking water

[25] Mapping climate change impacts on smallholder agriculture in Yemen using GIS modelling approaches - IFAD - January 2013

identified during CAP preparation, feasibility and cost assessment studies will be undertaken for each of individual and community drinking water systems identified. This will be a priority activity implemented as one of the first interventions in each community.

Sub-component 2.3: Drinking water.

34. The objective of this sub-component is to provide communities with reliable and safe access to drinking water during the dry season. The programme will support both individual household and community drinking water schemes including roof rainwater harvesting structures, protected shallow wells, and gravity-fed springs based on a locally available resources and climatic conditions. Water user associations (WUAs) will be established to manage and maintain community systems. Based on the needs for provision of drinking water identified during CAP preparation, feasibility and cost assessment studies will be undertaken for each of individual and community drinking water systems identified.

Sub-component 2.4: Construction/Rehabilitation of Quaternary Roads.

35. The main objective of this sub-component is to improve the quality and climate resilience of roads infrastructure to provide improved and reliable access to markets and supply of services and to open up communities in highland areas. In that respect, the Programme will enhance technical sustainability of existing earth/gravel quaternary roads through: (i) introduction of necessary erosion protection works, including through tree/shrub plantation; (ii) introduction of climate resilience in design and structures in roads; (iii) emphasis on road maintenance, and (iv) community involvement. Furthermore the project will also investigate how roads can contribute to climate resilience of local communities through e.g. incorporating measures for water harvesting and livestock drinking water structures. The Programme will adopt least-cost design standards in view of the expected continued low volume of traffic on the selected roads in the immediate future. The roads will be upgraded to an improved road standard and include climate resilient specifications (flood water collection, water harvesting, erosion risk reduction), wherever required. This will comprise (a) upgrading existing tracks with passing places providing for year-round access with traffic volumes averaging at least 10-20 vehicles/day and an average travel speed of 10 km/h; (b) constructing anti-erosion protection walls and side ditches, as well as (c) building small road structures (Irish bridges, barrage), when required.

36. The list of quaternary roads to be upgraded under the Programme will derive from: (a) the current list of roads to be rehabilitated identified by the Community Roads Unit (CRU) under the Ministry of Public Works and Highways, and (b) Community Action Plans. All identified road works will be ranked according to specific indicators by PMU Rural Engineers and PMU Gender and Community Development and Environment and Climate Change specialists. These indicators include: (i) poverty status of the communities serving as top priority; (ii) distance with main road/market/main city; (iii) economic potential of the area (iv) population served; (v) avoidance of negative environmental impacts; (vi) responsiveness of the community to participate in the investment costs and to take full responsibility for routine maintenance and contribute to periodic maintenance, and (vii) estimated total cost per km and per beneficiary. Road works will be selected according to their ranking up to the total amount of the allocated budget.

Component 3: Agriculture Development

37. The expected outcome of this component is: Improved climate resilient agricultural practices and technologies adopted. This will include enhanced on-farm water use efficiency and soil fertility regimes for food and feed crops, agricultural diversification, reduction of postharvest losses, and improved livestock feeding and health. Investments under this component include: (i) extension support and inputs provision; (ii) irrigation efficiency; (iii) agriculture production diversification, and (iv) research and development.

Sub-component 3.1: Extension support and inputs provision

38. The programme will train several lead farmers within each community as Village Agriculture Technicians (VATs) who then will act as resource persons to provide extension and advice to local

farmers. In each VU, the programme intends to train 8 farmers (4 men and 4 women) per community, identified by CDAs, who are known within their communities as good, progressive and respected farmers, knowledgeable, and literate to be trained on good agricultural production and animal husbandry practices. The training programme will focus on: (i) provision of veterinary services and guidance to implement good practices in animal husbandry including simple animal health treatment, vaccination, disease detection and reporting, as well as livestock feed regimes, crop residues, improved housing, and improved flock management practices, and (ii) the provision of services to improve yield and quality of agricultural production including soil conservation and fertility management (including crop rotation, organic and non-organic fertilization, agro-forestry), enhanced irrigation practices and technologies (including modern irrigation and water saving technologies), pest and disease management and, postharvest loss reduction. Special training will be provided on protected cropping including greenhouses or simple tunnel net-shade system. Care will be taken that environmental sustainability and projected climate change impacts are fully integrated in the VAT's training and in extension services.

39. The VATs will provide technical advice for their fellow farmers for free during the first year (in return of training and recognition of the status as VATs within their communities) after which and depending on the quality of services provided, as evaluated by the AREA and farmers, they can start charging fees in the second year. During the first years, a control mechanism will be set up through CDAs to ensure financial affordability of services for farmers but also to ensure financial sustainability for VATs. Extension support to farmers by the trained VATs will be carried out through field visits and discussions with the VATs as well as through the establishment of demonstration farmer's fields. The programme will ensure linkages between VATs and the Agriculture Research Extension Authority (AREA), MoAI Agricultural Offices, Directorate General of Animal Resources and the Central Veterinary Laboratory.

40. The programme will support the establishment of a small local input supply shop in each village unit managed by one trained VAT, identified by the CDAs, who is willing to invest his/her own funds. The shop will facilitate access of farmers to equipment (irrigation, sprayers and related protection material), enhanced post-harvest handling material (drying, packing, and storage material and equipment), seeds of local or climate adapted varieties and other agricultural inputs (fertiliser, pesticides and needed veterinary products). Financing of the VATs-owned inputs supply stores will be through VATs' contributions, a matching grant from the programme and a loan from a commercial bank partnering the programme.

Sub-component 3.2: On-Farm Irrigation Efficiency

41. This sub-component aims at improving irrigation water use efficiency through dissemination and promotion of proven technological packages for water saving and on-farm environmental modification and control. Modern irrigation systems will be promoted by the programme in each VU where water harvesting structures (small and medium dams, water retention barriers and farm ponds) have been implemented or rehabilitated under the programme, so as to extend the benefit of community water management to each individual. .

Sub-component 3.3: Agriculture Production and Diversification

42. Diversification of agricultural production for enhanced resilience will be promoted in various ways. The programme will promote protected vegetable production by piloting the use of low-cost greenhouses and simple tunnel net-shade low systems. Five greenhouses per village unit will be financed through beneficiaries' contribution, a subsidy from the AFPPF and a credit extended by a commercial bank. The Programme will also liaise with: (i) UNDP/SMEPS project aiming at developing nurseries in each governorate with young agronomists (the Programme will assist farmers and seedlings producers to enter into a contractual agreement); (ii) USAID project that has developed a low-cost greenhouse development programme as well as technological package for greenhouse adapted production, and (iii) with EOF-managed programmes for the establishment of small enterprises that could produce low-cost greenhouses locally (based on experience piloted by SMEPS

and by the Agricultural and Fisheries Production Promotion Fund with the assistance of Indian companies for the transfer of technology and know-how).

43. Agricultural diversification would also be promoted by enhancing the crop-livestock integration. The programme will demonstrate first and eventually promote such systems as sorghum-clitoria fodder under spate/well irrigation and rainfed conditions, depending on the available source of irrigation. This aims at providing an improved source and quality of animal feed and the introduction of crop rotation to restore soil fertility. The cost of demonstration phase such as inputs and extension services will be entirely met by the project.

Sub-component 3.4:Applied Research for Vulnerability Reduction

44. Through this sub-component, support will be provided by the programme to AREA to conduct several research trials in each governorate based on their specific agro-ecological conditions and projected impacts of climate change on local agriculture. These will aim at testing appropriate technologies, techniques and management practices that will enhance climate change resilience and risk mitigation. The programme will support research for the identification of crop alternatives at both the varietal and species level, by establishing and evaluating pilot demonstration plots of alternative crops established in selected VUs. Priority research in crop improvement includes: i) identifying new crop varieties tolerant to multiple stresses: drought, floods, heat, humidity, salinity, pests and diseases; ii) testing new crop species, resistant to harsh climatic conditions (especially drought and soil fertility), and with potential market or household benefit. Tested crops (species) could be those introduced from other regions within the country, or imported from other countries. The selection of the crops and the location of the demonstration testing plots will be guided by the GIS analysis that will be undertaken to identify a subset of VU in which new crop alternative opportunities would have the highest benefit, as per the various climate change scenarios.

45. Research trials could also include post-harvest loss management, testing alternative crops in qat production areas, improved productivity in greenhouses, development of non-conventional water resources for agricultural production, growing date palm under saline and re-used water, improved farming practices for increased climate resilience including multiplication of date palm and coconut, testing and genetic improvement of climate-change resilient/tolerant varieties. The programme support however, will remain flexible to incorporate additional relevant topics with focus on those which contribute to building climate resilience and adaptation.

Appendix 5: Institutional aspects and implementation arrangements

A. Organizational framework

Management

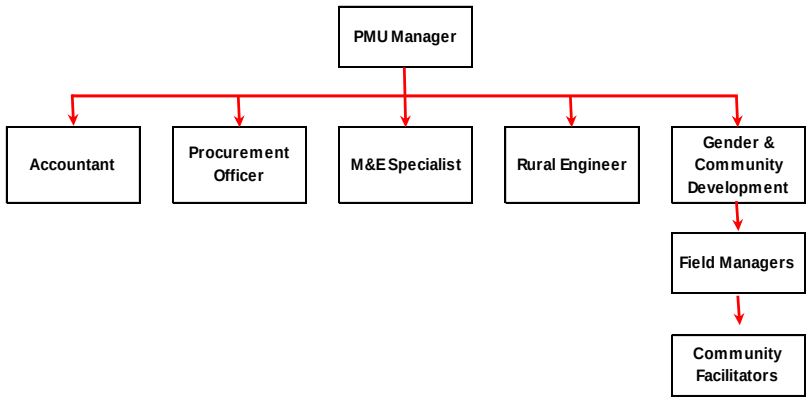
1. In line with the community-driven development approach, CDAs at Village Unit level will be considered the first level of programme planning and implementation. At each governorate level, the coordination of programme planning and implementation will be the responsibility of the Programme Management Unit (PMU) reporting to a Governorate Steering Committee (GSC). Overall coordination at national level and support for cross-cutting issues will be provided by a National Programme Coordination Unit (NPCU) located in Sana'a and reporting to a National Steering Committee.

2. **Programme Management Units**. In each governorate, PMUs will operate with a minimal staff and implementation will be contracted out to specialized public and private service providers, based on the model established under the ADCRMP and DPRDP. The PMUs main role will be in procurement and supervision of service providers, contract management, and mobilizing and managing relationships with target communities. PMUs will coordinate closely with the Governorate, District and Uzla administration to ensure that planning at VU-level feeds into District and Governorate development plans. In addition, each PMU will play an active role in the capacity building of the local administration. The programme will use the competent staff of the existing PMUs in Dhamar and Al Dhala while new PMUs will be established in each of the new governorates. All staff members will be recruited on a competitive basis in compliance with IFAD's procurement guidelines. Existing staff will be re-interviewed for their roles based on updated job descriptions. All staff contracts will be for an initial probationary period of six months compliant with Yemeni labor law, with the possibility of extension subject to satisfactory performance.

3. To ensure sustainability and ownership by the local population and continuity of activities after RGP completion, the RGP will ensure that each PMU is gradually integrated within the Governorate administrative structure. The RGP Mid-term review will assess feasible options for this integration, based on the outcomes of the ongoing National Dialogue and transition process and its impact on the decentralization process.

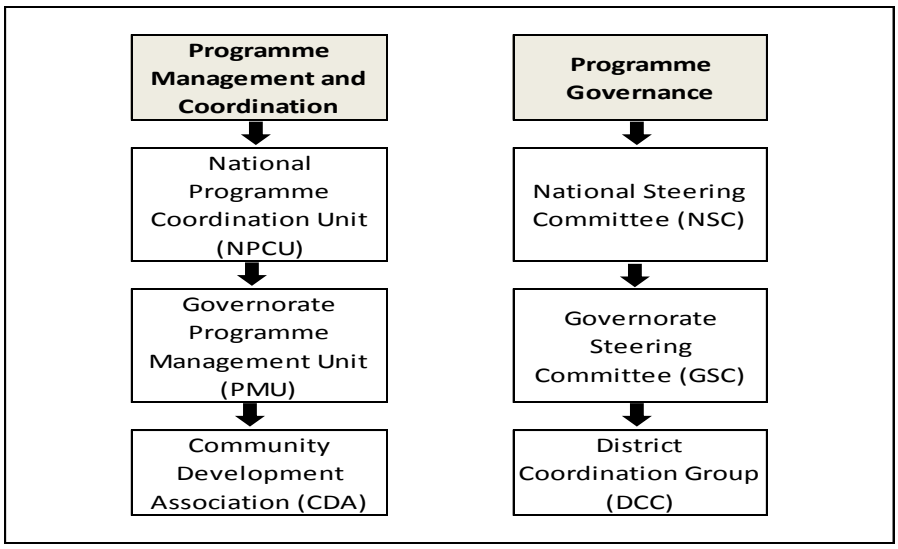
4. *Structure.* Each PMU will be headed by a Programme Manager (PM) with expertise in agriculture/rural development and staffed with a small team of professionals: (i) an accountant; (ii) a procurement officer; (iii) an M&E officer; (iv) a rural engineer; (v) a gender and community development officer, and (vi) two field managers supervising community facilitators operating at VU level. In addition, support staff (secretary, drivers and guards) will be recruited by each PMU. All staff positions are considered for the whole duration of the programme, except that for the rural engineer and the gender and community development specialist whose positions are ending after 5 years.

Figure 1: PMU's organizational chart



5. **National Programme Coordination Unit**. A light National Programme Coordination Unit (NPCU) will be implemented in Sana'a within the Agriculture and Fisheries Production Promotion Fund (AFPPF) which is co-financing the programme. This NPCU will provide PMUs with services related to cross-cutting and cross-governorate issues. Its staff will be competitively recruited. The NPCU will include the following positions: (i) Programme Director; (ii) Finance Manager; (iii) Internal Auditor; (iv) Consolidation accountant; (v) Senior M&E and KM specialist; (vi) Senior Procurement Officer; (vii) Environment and Climate-Change Specialist; (viii) Business Management/Rural Finance specialist; (ix) Secretary, and (x) support staff.

Figure 2: Programme Management, Coordination and Governance



Governance

6. The programme's governance will be threefold: (i) District Coordination Groups; (ii) Governorate Steering Committees; and (iii) a National Steering Committee.

7. **District Coordination Groups**. Located in each district selected under the programme and headed by the General Secretary of the District Council, they will also include: (i) executive members of the Local District Council; (ii) the President of each Community Development Association supported by the Programme in the district; (iii) the PMU Gender and Community Development Specialist, and (iv) two community facilitators (one man and one woman). The main responsibilities of each District Coordination Group will include:

- review of CAPs;
- coordination between stakeholders and local partners from the public and private sectors;
- conflict resolution.

8. **Governorate Steering Committees**. Governorate Steering Committees (GSCs) will be established, chaired by the Governor. They will also include: the General Secretary of the Local Council; the General Manager of the Agriculture and Fisheries Department of the MoPIC; the General Manager of the Loan and Grant Department of the MoF (in charge of loans and credits); the General Manager of the Planning Department; the General Manager of the Women Development Department and the General Manager of the Project Department of the MoAI; the Agriculture and Irrigation Office Manager, and the PMU Manager. The main responsibilities of each GSC will include:

- approval of Governorate Annual Work Plan and Budget;
- ensure coordination between all stakeholders;
- ensure coordination with Governorate development plans;
- review progress reports and performance of programme's activities;

- resolve any implementation issues;
- provide guidance to the PMU.

9. **National Steering Committee**. A National Steering Committee will be established at Sana'a and chaired by the Minister of Agriculture and Irrigation. Its members will include the Deputy Minister of each line ministry (MoPIC; MoAI; MoF; MoPW, and MoLA) and each PMU Manager. Its major role will be:

- to provide strategic and policy guidance for programme implementation;
- to approve the overall AWPB;
- to recruit the audit firm and approve its report;
- to review the recruitment process and endorse selection of PMU Managers and key staff;
- to review progress reports and performance;
- to resolve implementation problems not resolved at lower levels.

Implementation arrangements, responsibilities and partnerships

Component 1: Community Empowerment and Livelihoods Diversification

Sub-component 1.1: Community Institutions Building

10. In all governorates, the recruitment and training of Field Managers and Community Facilitators (CFs) will take place 3 months prior to starting operations in these governorates. Their training, carried out by the PMU Gender and Community Development specialist, will focus on poverty analysis, climate change adaptation, disaster risk reduction, gender and development, participatory planning processes and organization as well as on management of community organizations. Two Field Managers (one man and one woman) will be recruited by each PMU to supervise CFs teams. CFs teams will consist of one man and one woman contracted by the Programme for a period of maximum 3 to 4 years, in line with the integration of new governorates in the Programme.

11. In selected village units and based on the same successful methodology and model developed under the ADCRMP and the DPRDP, teams of Community Facilitators (CFs) together with PMU Field Managers will: (a) mobilize communities; (b) assist them with the registration of their Community Development Associations (CDAs); (c) build capacity of CDAs' members through training on action plan elaboration, association management, role and responsibilities of CDAs members, and conflict resolution, and (d) provide support to CDAs for the elaboration of their Community Action Plans (CAPs). The PMU Gender and Community Development Specialist and the NPCU Environment and Climate Change Specialist will assist CFs and Field Managers. Prior to their approval by District Coordination Groups and Governorate Steering Committees, all CAPs will be reviewed to ensure sufficient attention to climate risks and incorporation of specific adaptation measures.

12. Each CFs team will work with 8 new Village Units per year. They will also provide advisory services on request to 8 VUs inducted into the Programme in previous years. Overall, the assistance for each VU will last for 36 months. In addition to CF fees, the programme will finance their training and equipment (laptop, training material and vehicle).

Sub-component 1.2: Women's Empowerment

13. The NPCU will launch a national tender, inviting service providers to bid for the delivery of literacy and life-skills training programmes, by the same or different organizations (Adult Literacy Organization (ALO), specialized NGOs, training centres) in each of the targeted Governorates. The selected literacy service provider(s) will be responsible for: (i) selecting, together with the PMU Gender and Community Development Specialist, women from the communities to become village literacy trainers; (ii) training the selected women; (iii) supervising implementation of training courses; (iv) paying salaries of village literacy trainers, and (v) certifying both trainers and trainees. Literacy training will be complemented with the distribution of post-literacy materials, at the appropriate level,

integrating information on new techniques and technologies for agriculture, livestock, health, nutrition, environment as well as general cultural reading in order to ensure that literacy skills are maintained. Life-skills training will be implemented directly by the selected service provider(s) and will include issues of concern for women and their families such as healthcare, nutrition, legal rights, and environmental issues.

14. Provision is made for 100 women in each VU to receive both levels of literacy training and life-skills training (following completion of the first year's literacy training). Selection of trainees will be undertaken by the CDAs and PMU field staff based on poverty targeting criteria.

Sub-component 1.3: Microfinance

15. At programme inception, the NPCU will launch a Call for Expression of Interest for the selection of a MFI among those that are already licensed by the Central Bank of Yemen (Al-Amal Microfinance Bank, Tadhamon Microfinance Unit and Al-Khuraimi Microfinance Bank). The signature of a Memorandum of Understanding (MoU) between the selected MFI and the Programme will be subject to a positive assessment of the MFI based on a due diligence exercise carried out by a local audit firm contracted by the NPCU. The MoU will regulate the relationship between the selected MFI and SCGs/SCAs with regards to capacity building and to refinancing. In particular, the MoU will state the necessary indicators to be met by a SCG in order to access refinancing loans from the selected MFI.

16. PMU's Community Facilitators will be responsible for supporting the creation of SCGs in target communities, based on the model developed under the ADCRMP and DPRDP. Technical assistance will be provided to SCGs (governing bodies' members, manager, and accountant) by an international expert contracted by the NPCU. The selected MFI will also provide technical assistance to SCGs and SCAs especially with regards to: (i) fine-tuning SCAs/SCGs loans terms and conditions with that of the selected MFI, and (ii) elaborating their manual of procedures.

Sub-component 1.4: Livelihoods Diversification

17. Consulting firms, NGOs and training centres competitively selected by the NPCU will provide technical capacity building and regular coaching to groups of micro-entrepreneurs, mainly youth and women. NPCU Business Development/Rural Finance Specialist will identify and assess business opportunities and provide financial management training to micro-entrepreneurs. Climate change related training will be provided by the NPCU Environment and Climate Change Specialist.

18. Matching grants will be approved by the NPCU-based FIFAMSEs Investment Committee as described in Appendix 4. A list of potential beneficiaries for activities to facilitate market access will be submitted by each PMU (on the basis of a list elaborated by community facilitators and field managers) while the final selection will be made by the FIFAMSEs Investment Committee.

Component 2: Natural Resources Management and Resilient Infrastructure

Sub-component 2.1: Integrated Water Management and Soil Conservation

19. Based on CAPs, the PMU Rural Engineer and the PMU Gender and Community Development Specialist will rank all potential VUs according to the following indicators and criteria: (i) *social criteria*: number of households below the poverty line, their percentage in the VU, absence of drinking water schemes and the willingness to form groups of interest; (ii) *economic criteria*: command area (current and incremental) and current average income per crop/ha, and (iii) *investment criteria*: cost per ha/per HH of the three types of investments. To evaluate that last criteria, the PMU Rural Engineer will undertake a pre-feasibility study (design of the scheme) inclusive of an environmental impact assessment of the proposed integrated scheme (together with the NPCU Environment and Climate Change Specialist), an investment cost analysis and crops financial projections, as well as a household budget. Communities will be involved in the study as well as in the design of the integrated scheme and required infrastructure. In addition, two pre-conditions will have to be agreed upon by communities: (i) CDAs will formally commit to not install irrigation schemes for existing *qat* farms or increase the area under *qat* cultivation, and (ii) communities agree to set up a Water Users'

Association (WUA) that will be responsible for the maintenance and monitoring of water infrastructures.

20. Water harvesting works will be implemented by the World Bank-supported Public Work Project (PWP) contracted by the NPCU. The World-Bank PWP will be responsible for:

- finalizing the preliminary studies, investment estimates, financial projections, environmental impact assessment;
- preparing tendering documents;
- launching a regional tender (national tender if required);
- selecting the contractor;
- supervising the contractor, and
- authorizing payments.

21. Land conservation works will be implemented directly by the CDA contracted by the relevant PMU. CDAs will contract a local firm and manage community contracts for small civil works to execute soil conservation works following the regional tender process and relevant procurement threshold and under the supervision of the NPCU Environment and Climate Change Specialist, the PMU Procurement Specialist and the Village Agriculture Technicians.

22. The PMU Gender and Community Development Specialist and CFs will assist communities to create/strengthen their WUAs and Land Management Associations (LMAs). He/she will provide them with training to ensure proper maintenance of rehabilitated or constructed structures together with PWP (for water harvesting structure) and contracted firms, AREA, the Governorate Agriculture and Irrigation Offices (for land conservation).

23. Communities will contribute to the land conservation investment costs a minimum of 50% of the total cost (in-kind contribution) while the Agriculture and Fisheries Production Promotion Fund (AFPPF) will finance the balance.

Sub-component 2.2: Rangeland Rehabilitation

24. This sub-component will be implemented jointly by the DFR and the CDA. The PMU will subcontract DFR to undertake the initial rangeland assessment while providing technical assistance and the needed capacity building. Technical assistance will be provided in all needed areas of activities to ensure that sufficient future capacity is available within the DFR. DFR will support CDAs in the preparation of the rangeland management plans, their implementation and monitoring. The PMU Gender and Community Development Specialist and community facilitators will assist communities to create their Rangeland Management Associations (RMAs) and provide them with training to ensure proper management and protection of rehabilitated rangelands. Whenever applicable, communities will contribute to the investment costs a minimum of 20% of the total cost (in-kind contribution) while the Programme will finance the remaining balance.

Sub-component 2.3: Drinking Water

25. Based on the needs identified during CAP preparation, preliminary studies (including water availability projections), system design and estimates of investment and operating costs will be prepared by the relevant PMU Rural Engineer. Individual household systems (roof-harvesting structures) will be constructed by local contractors contracted by the relevant PMU on the basis of a competitive bidding process. Community drinking water systems (based on boreholes, wells and spring) will be implemented by the World Bank-supported Public Works Programme. The World-Bank PWP will be responsible for:

- finalizing the preliminary studies, investment estimates and financial projections;
- preparing tendering documents;
- launching a regional tender (national tender if required);
- selecting the contractor;

- supervising the contractor, and
- authorizing payments.

26. The PMU Gender and Community Development Specialist together with specialized service providers will assist communities to form their WUAs and will train their committees in group management, conflict resolution, and financial management while specific training will be ensured by the contractor with regards to technical management and maintenance of infrastructure constructed and machinery installed. The NPCU Environmental and Climate Change Specialist will train communities and WUAs bureaus in all aspect related to climate change adaptation and efficient water usage. Appropriate mechanisms will be devised to ensure that women, who have a keen interest in the functioning of the system, are full participants in WUAs. WUAs will fall under the supervision and monitoring from their relevant CDA.

27. For individual drinking water schemes, households will contribute a minimum of 50% in the investment cost (in-kind contribution) with the programme financing the balance of investment costs. For community water schemes, the community will contribute a minimum of 20% in the investment cost (in-kind contribution) with the programme financing the balance of investment costs.

Sub-component 2.4: Construction/Rehabilitation of Quarternary Roads

28. Once VUs have been identified, PMU Rural Engineers will carry out the preliminary design of road works inclusive of specific climate-resilience requirements. CDAs will participate in that preliminary design. The road rehabilitation and construction work in each governorate will be contracted out by each PMU on a competitive basis (service providers could include PWP, CRU or any local engineering firm). The contracted service provider will:

- finalize the preliminary technical feasibility study including an environmental impact assessment and the financial projections;
- issue tendering documents, including climate resilience specifications where appropriate;
- launch a regional tender;
- select the contractor;
- supervise the local contractor;
- authorize payments;
- train communities in road maintenance;
- identify and train in each community one local community supervisor, and
- assist communities to form their Road Maintenance Groups (RMGs) under the supervision and monitoring of the CDA.

29. The PMU Rural Engineer and the NPCU Environment and Climate Change specialist, where appropriate, will approve the final design of the road and the related tendering documents. Training provided by the contracted service provider to RMGs members will include technical aspects on road maintenance as well as management and budgetary aspects. Payments will be authorized by the selected service provider on the basis of reports issued by the local community supervisor.

30. Programme will finance the upgrading of between 25 and 56 km of quarternary roads in each governorate. In-kind contribution from communities will amount to 10% of the total cost of the civil work.

Component 3: Agriculture Development

Sub-component 3.1: Extension Support and Inputs Provision

31. The selection of individuals to be trained as VATs will be done by CDAs. Training of VATs will be designed and provided by the Agricultural Research Extension Authority (AREA), governorate Agricultural Office staff, and universities subcontracted by the NPCU. AREA will undertake the initial and refresher courses and will provide any special training that may be required based on the needs

identified by communities, and will provide on a regular basis the necessary advisory services and capacity building to VATs. The Programme will also liaise with the AREA to identify areas of possible improvements and innovations, new varieties, inputs and production and postharvest material and equipment to be promoted. From programme year 2, at least one VAT per village unit will be selected to be the owner of an inputs supply store financed through VAT's contribution (30%), project grant (30%) and debt financing from a partner microfinance institution (40%). The programme will assist VAT's store owners with management training courses. VATs will be formally linked to public extension services for crops and livestock and will record services provided and submit reports on crop and livestock disease and pest outbreaks.

Sub-component 3.2: Irrigation Efficiency

32. Alongside the construction/rehabilitation of off-farm water harvesting structures, PMUs will support introduction of modern irrigation systems on-farm in line with the modalities of the National Irrigation Programme (NIP). In addition, based on CAPs, VUs will be selected for the implementation of modern irrigation schemes independently from water harvesting investments, using poverty level, agriculture potential and diversity, as well as proportion of smallholders willing to adopt modern irrigation schemes indicators. Once selected, a specific survey study will be undertaken by the relevant Governorate Agriculture and Irrigation Offices to identify the proper modern irrigation system, its design and its cost/benefit for each beneficiary. Based on the study outcomes, the relevant PMU will procure the necessary equipment. Specialized training on the use, installation and O&M of modern efficient technologies such as GR drip irrigation and bubblers will be provided by VATs assisted by representatives from the NIP and the Governorate Agriculture and Irrigation Offices. On-farm investments in modern irrigation systems will be financed through beneficiaries' contribution (20%), AFPPF (as a grant of 40%) and a loan from a commercial bank (40%).

Sub-component 3.3: Agriculture Production and Diversification

33. This sub-component will be implemented by VATs who will be trained on such a technology through AREA. Technical support will also be provided by SMEPS and other relevant partners active in this area including UNDP and USAID. CDAs will identify potential beneficiaries for the greenhouses on the basis on their experience, their skills, the availability of land and their willingness to finance and manage a greenhouse.

34. FMs and CFs supported by PMUs Gender and Community Development Specialist and the NPCU Environment and Climate Change specialist will select VUs in each governorate willing to pilot demonstration plots so as to introduce new climate change resilient crops/species, technologies and best practices. Selection criteria for VUs will include: poverty level, land availability, and agro-ecological characteristics. Demonstrations will be piloted by VATs with the support of AREA. Through advisory services, VATs will also encourage farmers to adopt demonstrated climate-change resilient crops/species, and technologies.

Sub-component 3.4: Applied Research for vulnerability reduction

35. This sub-component will be implemented by AREA with the support of MoAI Agriculture and Irrigation Offices. Trials will be implemented in each governorate based on their agro-ecological conditions. In addition, one fully equipped greenhouse (including drip irrigation) will be allocated to each AREA center (4 governorate as Al-Dhala governorate is covered by Dhamar AREA center) to develop adapted technological packages for production under greenhouses. At the end of each trial, AREA will issue a leaflet summarizing the findings and outcomes of the trial and the conditions for its scaling up in all programme governorates. AREA will also organize a one-day workshop per year for VATs, staff of MoAI Agriculture and Irrigation Office to disseminate knowledge and lessons learnt on trials, and quarterly one-day exchange visits for farmers for enhanced interaction and information and knowledge sharing. This subcomponent will work closely with the GEF project being developed through which different GIS models for the vulnerability and suitability of various crops under different climate change scenarios will be developed.

Appendix 6: Planning, M&E and learning and knowledge management

A. Planning

1. Each year an annual work plan and budget (AWPB) will be prepared by each PMU on the basis of CAPs prepared at community level. A consolidated AWPB will be issued by the NPCU including the five governorates and the NPCU's activities. The AWPBs will be prepared through a participatory approach with stakeholders, incorporating information from NPCU's and PMUs' M&E system and recommendations by IFAD supervision and implementation support missions. PMUs AWPBs will be submitted to the relevant Governorate Steering Committee (GSC) while the consolidated AWPBs will be submitted to the National Steering Committee (NSC) for approval. Following its approval by the NB, approved AWPBs will then be submitted to Government, IFAD and co-financiers for concurrence.

2. Each PMU will seek to ensure maximum synergy is achieved between different activities implemented in the governorate as well as synergy with governmental projects and other ongoing projects and programmes, particularly those of the Programme's financiers. Same synergy will be sought at national level and between governorates. A consolidated implementation matrix will be prepared annually based on PMUs Annual Work Plan and Budgets to ensure synergies and complementarities are identified and exploited and to facilitate field-level coordination of implementation.

3. Each PMU will convene quarterly or semi-annual meetings with participating organizations to ensure that its strategic and operational agenda is driven by the concerns of the target groups.

B. Supervision

4. The programme will be directly supervised by IFAD. Direct supervision will encompass three discrete processes: (i) loan administration; (ii) programme supervision; and, (iii) implementation support. Direct supervision is perceived and will be applied as a continuous process which requires ongoing communication and engagement with Government and NPCU/PMUs management. Key supervision processes which will be applied are outlined below.

Loan administration: ensuring fiduciary compliance:

- legal conditions;
- financial management;
- procurement and contracting.

Programme supervision: assessing implementation performance:

- overall implementation performance and progress towards objectives;
- programme investments, activities and outputs;
- statutory requirements (AWPB, monitoring, reporting);
- steering, management, implementing institutions;
- targeting and gender mainstreaming.

Supporting implementation: programme level:

- providing guidance towards achievement of objectives;
- supporting adaptation in response to evolving conditions;
- creating systems for sustainable flow of benefits;
- resolving operational issues and problems;
- generating lessons and articulating best practices.

Supporting implementation: country level:

- introducing a broad programmatic view of development investments;
- influencing policy on the basis of operational experiences;
- developing systems and institutions for poverty reduction;
- facilitating financial and operational partnerships.

Supporting implementation; IFAD level:

- generating knowledge and lessons;
- feeding operational lessons into new programme design;
- creating innovative instruments, investments, pilot activities;
- enabling portfolio restructuring to improve outcomes and results.

5. Programme design will invariably be superseded by reality over time, as a result of changing conditions, emerging operational experiences, political and macro-economic changes, exogenous developments and force majeure. The supervision process will guide the programme towards the achievement of strategic objectives and broader poverty reduction outcomes, while ensuring fiduciary compliance and responsiveness to the accountability framework. Several instruments will be applied to influence implementation: ongoing policy dialogue with Government; adjustment of annual work plans and budgets; revision of implementation manuals; undertaking of supervision and mid-term review missions, and legal amendments as appropriate.

C. Results based monitoring and evaluation

6. The Programme's M&E system is designed to offer comprehensive and reliable information to improve planning and decision-making for results-based management. Considering the extent to which programme impact depends on Community Action Plans and related infrastructure investments, improved crop, livestock, income generating activities and MSEs competitiveness, the system will be participatory and decentralized, actively involving target groups and executing partners. The logical framework will constitute the basis for results-based M&E, and include an initial list of indicators to track progress and achievements. All M&E data, analysis, and reporting will be disaggregated by gender. All M&E activities will be based on the IFAD Guide for Project M&E.

7. The M&E system will have a three-level structure:

- Output monitoring - will focus on physical and financial inputs, activities and outputs. Data will flow directly from records at different management levels (PMUs and NPCU, ministries, programme-supported MSEs, private sector, MFIs, service providers) and from periodic management reporting. Simple indicators will be agreed at start up and monitored quarterly. They will include relevant first-level indicators of IFAD's Results and Impact Management System (RIMS). AWPBs will provide the targets for first level monitoring.
- Outcome monitoring - will assess the use of outputs and measure their benefits at beneficiary, enterprises and value chain levels. At beneficiary level, it will focus on the accessibility of programme outputs and the extent to which they provided benefits to the target groups in terms of access to finance, services, secure/remunerative markets. It will also include MSEs' achievements in terms of returns, added value, direct and indirect job creation, and prospects for sustainability.
- PMUs Monitoring and Evaluation officers, NPCU Senior Monitoring and Evaluation Officer as well as PMUs FMs and CFs will be responsible for data collection and participatory data analysis. PMUs officers and NPCU Senior Officer will develop templates and methods for data collection and analysis. Data collection will be periodic while participatory analysis and reporting will be annual through workshops, with results fed into AWPBs and progress reports. Annual workshops will be undertaken with stakeholders for participatory evaluation purposes. This will enable the assessment of progress towards objectives, enabling the Programme

management, beneficiaries and stakeholders to take any appropriate corrective measures. The data will be cross-checked with activity reports issued by programme-contracted service providers and transmitted to each PMU M&E officer and/or to the NPCU M&E Senior Officer. Participatory community-based monitoring will be an important part of the overall M&E approach in generating learning. Involving community members in identifying how they view and judge the activities and impact will be a valuable learning exercise for the Programme and its partners. It will also participate in the empowerment of communities, by helping them to better understand the Programme, while also helping the Programme to better appreciate their expectations. It will also help other stakeholders to fine-tune services and products to these expectations, and will provide a foundation for a participatory approach to reviewing performance.

- Impact assessment - will assess programme impact for the target groups in comparison with objectives. It will focus on higher level impact indicators such as household incomes, gender equality, communities' poverty status, and changes in the resource base. It will be based on a sample of households/settlements selected in the Programme targeted governorates that will remain constant during the programme life. Economic multiplier analysis will be applied to assess the wider impact on the rural economy generated by the Programme especially when considering infrastructure investments. The NPCU and each PMU will, together with stakeholders and beneficiaries, conduct a formal impact assessment in the Programme's final stages which will include an assessment of achievements, capturing of lessons learnt and best practices and analysis of prospects for sustainability.

8. Ad hoc surveys, qualitative case studies and thematic reviews will be outsourced to independent institutions to verify results and draw lessons on themes such as market access, community empowerment, social cohesion, operation and maintenance, and micro- and small enterprise development. Specific studies will be undertaken on the impact of pilot projects (renewable energy and greenhouses) as a way to measure its performance, impact and replicability.

9. The NPCU and governorates PMUs will conduct, at the Programme outset, a Start-up Workshop, with the aim of sensitizing NPCU and PMUs staff, service providers and beneficiaries regarding Programme objectives and scope. The Programme's logical framework will be reviewed and M&E indicators defined at this workshop. The workshop's timing and agenda will be agreed between Government and cofinanciers.

10. As M&E is concerned with changes in the beneficiary situation over time, it involves making comparisons to assess changes taking place during the programme life. At the beginning of implementation an initial general Baseline Survey will be conducted by each PMU in selected locations to assess the physical and socio-economic status of the village units and their households and to define their benchmark status. Village Units will be sampled considering the different infrastructure investments under the Programme. Surveys will be undertaken by contracted service providers and will focus on collecting data related to the selected M&E indicators.

11. Two Mid-Term Reviews will be undertaken in PY3 and PY5 covering: (i) physical and financial progress in comparison with AWPBs; (ii) performance assessment of service providers; (iii) changes in communities empowerment, and (iv) overall progress towards the achievement of programme objectives.

12. At the end of the Programme, a Programme Completion Report will be undertaken through a formal survey by an agency without previous involvement in implementation. It will examine the overall performance of the Programme taking into account a broader and longer term perspective.

13. ***Reporting***. Three reports will be produced: (i) a quarterly progress report by each service provider and executing partner in each governorate; (ii) a semi-annual progress report, and (iii) an annual progress report. The Programme logframe includes the draft indicators against which programme performance will be monitored and the sources of data to be used; these indicators will be discussed and agreed at programme start-up. Each PMU will issue the set of three reports that will be

reviewed and approved by each relevant GSC prior to its submission to the NPCU that will consolidate them before submitting them to the National Steering Committee for approval and then to IFAD, the Government and co-financiers.

14. Overall the responsibility for programme M&E activities will rest with the NPCU M&E Senior Officer and PMUs M&E Officers. PMUs M&E Officers will be supervised by the NPCU M&E Senior Officer while reporting to PMUs Manager. The PMUs M&E Officers will also be responsible for collecting and analyzing data gathered from service providers in each governorate on the basis of an agreed reporting format and timeframe. A reporting system to track physical/financial performance and emerging impact will be implemented in each governorate (PMU) and for the Programme (NPCU).

RIMS indicators

15. Since 2004, IFAD has promoted RIMS as a standardized system of reporting results and impact which all IFAD-funded operations must adhere to. RIMS is intended to measure programme results at the three levels of the logical framework concerned with outputs, effects and impact. It relies on specific indicators as instruments to measure results at each level. The Programme's M&E system will include appropriate first, second and third level RIMS indicators (taken from the standard list compiled by IFAD) depending on the nature and scope of the Programme. IFAD requires each programme to report on RIMS indicators annually each March; there is a specific reporting format, and reports should be compiled from data contained in the M&E reports and sent to IFAD. The inclusion of RIMS indicators in the M&E system will facilitate the computation and reporting on RIMS at the end of each year. All indicators utilized will be socially and gender sensitive and disaggregated by gender and socio-economic category to ensure that the programme is reaching its intended target beneficiaries. Selection of appropriate First, Second and Third level indicators will be finalized at Programme start-up by the NPCU and PMUs' M&E team.

16. ***First-Level Results***. First-level indicators measure quantitative financial and physical progress. First level results are reported annually starting from the end of PY1. The following RIMS indicators are of relevance to the Programme and may be reported on:

- Total Programme Outreach
- Individuals, households, groups and communities receiving programme services
- Programme Activities
- People trained in infrastructure management
- Groups (and people in groups) managing infrastructure formed/strengthened
- Groups managing infrastructure with women in leadership positions
- Land under irrigation schemes constructed or rehabilitated
- Rainwater harvesting systems constructed or rehabilitated
- People trained in NRM
- Groups (and people in groups) involved in NRM formed/strengthened
- NRM groups with women in leadership positions
- Environmental management plans formulated
- Land under improved management practices
- Other productive infrastructure constructed/rehabilitated
- People trained in crop production practices and technologies
- People trained in livestock production practices and technologies
- People accessing advisory services facilitated by the Programme
- Households receiving facilitated animals health services
- Savings and Credit Groups (and people in groups) formed and/or strengthened

- Savings and credit groups with women in leadership positions
- Financial institutions participating in the Programme
- Staff of financial institutions trained
- Voluntary savers
- Value of voluntary savings
- Active borrowers
- Value of gross loan portfolio
- People training in financial services
- People trained in post-production processing and marketing
- Roads constructed/rehabilitated
- Storage, processing facilities constructed or rehabilitated
- People trained in Income Generating Activities
- People trained in business and entrepreneurship skills
- Government officials and staff trained
- People trained in community management topics
- Community workers trained
- Village/community plans developed
- People accessing development funds (grants from the Programme)
- Drinking water systems constructed/rehabilitated

17. ***Second-level results***. Second-level indicators measure improved functionality or behavioral change, namely the effectiveness of interventions in terms of delivering the expected benefits and the likely sustainability of these benefits in the longer term. Second-level results are more qualitative and take longer to realize. They are reported starting from mid-term. The actual ratings are reported in terms of effectiveness or sustainability; the rating for effectiveness and sustainability is arrived at by analyzing a number of supporting indicators some are first-level RIMS indicators, some are part of the M&E system, and some are second-level indicators that can be reported when data is available. Effectiveness and sustainability ratings may also require data from special studies, surveys or existing secondary sources.

- Programme activities.
- Likelihood of sustainability of groups managing infrastructure formed/strengthened.
- Effectiveness of productive infrastructure [by type].
- Likelihood of sustainability of productive infrastructure [by type].
- Likelihood of sustainability of NRM groups formed and/or strengthened [by type].
- NRM and conservation programme.
- Improved performance of the service providers.
- Improved agricultural and livestock production.
- Likelihood of sustainability of the Credit and savings groups formed/strengthened
- Improved access of the poor to financial services
- Improved performance of financial institutions
- Producers benefiting from improved access to markets
- Likelihood of sustainability of roads constructed/rehabilitated
- Likelihood of sustainability of processing, marketing or storage facilities
- Creation of employment opportunities

- Likelihood of sustainability of enterprises
- Promotion of pro-poor policies and institutions

Community development

- Likelihood of sustainability of the community groups formed and/or strengthened
- Social infrastructure
- Likelihood of sustainability of social infrastructure formed/strengthened

18. **Third-level results.** Third-level indicators measure Programme results or impact on the target beneficiaries (impact is the combined effects of first- and second-level results). Third-level results are quantitative and measured at specific points during the Programme life (e.g. at baseline, mid-term, completion). These results will be reported at mid-term and at completion by comparing data gathered from the baseline survey with data from repeat surveys at tri/mid-tem and completion.

Economic Infrastructure - Specific Monitoring Considerations

19. National regulations. Infrastructure investments will be subject to the legal framework for design approval, issuance of construction permits and environmental impact assessment. The latest updates of Environment Protection Law No. 26 of 1995 (EPL) define the thresholds and steps of the formal EIA, including public consultation and information disclosure. The PMUs Rural Engineers and NPCU Energy Engineer as well as contracted service providers such as Community Development Association, Community Roads Unit Project and Public Works Project will be responsible for compliance with all relevant environmental and construction regulations.

20. Mitigation measures. The PMUs Engineers will ensure that investments have in-built environmental enhancement features and that the technological mitigation measures identified in the environmental studies are included in the detailed design. The PMU Field Managers and Community Facilitators will ensure that social impact mitigation measures are being adequately implemented and that local communities through their groups of interest and Community Development Associations approve of the investments and of the measures being put in place to ensure they benefit from them.

21. Monitoring. Infrastructure investments will be visited regularly by the PMUs' staff who will monitor environmental indicators and ensure that groups of interest and Community Development Associations are effective, train and monitoring operation and maintenance aspects of these investments.

Climate change resilience

22. Specific consideration will be put in Midterm Reviews and Programme Completion Report on measuring the impact of climate change resilience activities implemented under the Programme, particularly water resources management, renewable energy, and crop and livestock activities. Through indicators defined during the Programme Inception Workshop, the Programme will evaluate the impact of activities related to climate change adaptation in terms of households' income, women workload and changes in households' total productive hours, and improved management of natural resources (particularly water and land).

D. Learning and knowledge management

23. While scaling up to incremental communities and governorates, the programme will promote the successful approaches, methodologies, and activities of three previous IFAD-financed projects to community development, rural microfinance and institutional arrangements in Yemen. Operational experiences will create valuable knowledge in these areas, which will be captured by the NPCU/PMUs and utilized to generate lessons and best practices to be shared with public institutions, the IFAD country team, partners and others. The results of programme support for developing sustainable community-based development institutions and infrastructure as well as sustainably expanding microfinance operations in rural areas will be widely publicized. Partnerships with IDB, WB and EU operations will be intensified in this respect.

24. ***Regional Knowledge Networking***. The programme will promote: (i) in-country knowledge networking through periodic seminars and workshops; (ii) regional knowledge networking such as Karianet, (iii) regional research networks including those supported by IFAD grants. The IFAD-country team will contribute to in-house knowledge sharing and networking within IFAD.

Appendix 7: Financial management and disbursement Arrangements[26]

1. **Country Specifics:** The 2012 TI index ranks Yemen at 156/176 countries with a rating of 23/100. The mission has consulted the following documents to review the state of Yemen's Public Financial Management to assess and enhance the financial management arrangements for the Project - Yemen's Public Expenditures and Financial Accountability (PEFA 2008); USAID assessment on the Ministry of Agriculture and Irrigation (2008); USAID assessment on corruption in Yemen (2006).

2. The Government of Yemen has adopted a comprehensive Public Financial Management (PFM) Reform strategy approved by Cabinet in 2005. The strategy identifies six main objectives: (i) improve the level of priority setting and basis for decision-making; (ii) improve budget execution; (iii) develop public finance management information systems;(v) enhance control and financial accountability; and (vi) improve the system of bidding and procurement; and improve capacity and skills of public finance staff.

3. The PFM reform programme adopted has been informed by a number of studies carried out by the World Bank and the **IMF** including a Country Financial and Accountability Assessment (2004), and a Country Procurement Assessment Report (2003). The PFM systems are being enhanced with the assistance of development partners, however reforms have gone slower than expected.

4. The PEFA and USAid report (Yemen Corruption Assessment) have noted the following challenges with PFM in Yemen: a) lack of transparency in the budget; b) lack of aggregate fiscal discipline; c) limited parliamentary oversight of the budget process; d) approved budget does not relate to the executed budget therefore forcing line ministries to bargain for every expenditures; and e) challenged delivery of services due to difficulties in the areas of salary controls and procurement management

5. Many specific individual functions of PFM are carried out very well; however it is important to keep in mind the importance of linkages between PFM activities and the tendency for a PFM system to deliver overall at a level influenced significantly by the weakest links in the activity chain. There are three main factors that colour PFM in Yemen: 75% of Government revenues are derived from oil; considerable capacity constraint in many areas of PFM including manual operations in district and line ministries and insufficiently trained personnel; on-going reforms in legal and regulatory framework.

6. The USAid Yemen Corruption Assessment (2006) states that the most common forms of administrative corruption in Yemen are taking of bribes by Government employees and the hiring of ghost workers in government ministries. Additionally the report highlights the fact that the national budget is used as a mechanism for "pay-offs"; the budget's conservative estimate of oil revenues allows for crafting of discretionary supplemental budgets towards fiscal year end. The report noted that there is no specific anticorruption authority in Yemen.

7. To further assess financial management, the mission conducted 2 separate missions in April and July 2013 during which FM Assessments were requested from the following entities – Economic Opportunities Fund; Community Roads Unit; Al Dahla PMU; Dhamar PMU; and Agriculture and Fisheries Production Promotion Fund. The mission met with financial management staff from the entities to validate the assessments.

8. The overall findings of the assessments are summarized in Annex 3. Based on these assessments, the financial management risk in Yemen has been assessed as high. Arrangements for the project have been detailed to ensure that the residual risk is medium.

[26] The mission was requested to assess several agencies to make a determination as to where the PCU should be placed. The mission has therefore assessed the Economic Opportunities Fund; Dhamar PMU; Al-Dhala PMU; and the Agriculture and Fisheries Production Promotion Fund; Community Roads Unit and Ministry of Agriculture.

9. **Budgeting:** This project will receive funding/contributions from 8 sources – IFAD Loan; GEF Grant; ASAP Grant; EU Grant; Islamic Development Bank Loan; MFIs; Beneficiaries and Government. The consolidated Annual Work Plan and Budget (AWPB) will be prepared, by the PCU, after the submission from each of the 5 Governorate PMUs. Each Governorate PMU will prepare an AWPB separating the sources of funds and indicating funding requirements on a quarterly basis. While counterpart funds are budgeted annually, delays in receipt have been noted. To mitigate the risk, GoY will be requested to place at least 6 months of financing in a separate account at the beginning of each project year.

10. **Funds flow and Disbursement Arrangements: The Project will use the imprest fund method for the Designated Account advances** the modalities, with respect to imprest fund will be detailed in the Letter to the Borrower (LTB). Advances to the Designated Account (DA), for the Loans and Grants, will be transferred to separate accounts held in USD and EUR at the Central Bank of Yemen (CBY). The diagram in Annex 1 details the flow of funds. The PCU and each Governorate PMU will open operational accounts in Yemini Rials at CAC Bank or another commercial bank acceptable to IFAD. On the basis of the approved AWPBs, the PCU will request for a transfer of the equivalent of 3-months of expenditure for itself and the Governorate, directly from CBY to the respective operational YER account. On the justification of 75% of the previous advance and 100% of any preceding advances the next 3-month advance may be provided.

11. **SOE Thresholds.** Will be defined within the Letter to the Borrower and may be subject to change.

12. **Direct Payment.** The PCU may submit withdrawals for Direct Payment for a single expenditure in excess of USD 250,000 equivalent.

13. The Authorized Allocation (ceiling) of the DA is USD 7,000,000 equivalent. An initial advance will be limited to USD 1,500,000 equivalent and will be pooled for IFAD, GEF and ASAP and USD 1,000,000 equivalent in EUR for the EC which will be deposited when the activities related to the funding start. Further advances will be based on the activities and the cash forecast within the approved annual work plan and budget. Additional advances will also be contingent on the satisfactory financial management performance as indicated during supervisions and in the annual audit reports.

14. The PCU will be responsible for coordinating the PMUs expenditures and their expenditures and submitting the same to IFAD in a single Withdrawal application. In order to ensure that there is no paucity of funds in the DA, and to ensure the regular reporting of expenditures, the DA will be replenished at least every 90 days or when 30% of the advance has been utilized, whichever occurs sooner. It will be the responsibility of the PCU to ensure that there is no build-up of idle funds at the Governorates

15. The PCU shall make the proceeds of the Financing available to the Project Parties upon terms and conditions specified in the Financing Agreement or otherwise approved by the Fund for the purpose of carrying out the Project. All project related expenditures, incurred by the PCU and the Governorate PMUs will be through checks or electronic transfers. Petty cash not exceeding USD 500 equivalent may be maintained securely by the cashier.

16. **Accounting System:** It was noted that a specialised bilingual accounting software is available in Yemen for donor-funded projects. It can be further customized to produce reports and withdrawal applications per the requirements. The Project is expected to have accounting systems at the PCU and all PMU offices before the commencement of operations. The existing PMU offices at Dhamar and Al-Dhala already have the required accounting systems; however these will have to be modified further to link into the PCU's system. To enable the PCU and the newly established 3 PMUs to purchase and set-up a system that is compatible, **retroactive financing for the same is recommended.** Additionally, the PMUs will use LGMIS to submit all withdrawal applications to the PCU, for further review, consolidation and submission to MOPIC. LGMIS will be modified to ensure that the PCU is granted sufficient access and approval powers within the system at a level that will

allow the PMUs to submit to the PCU. **The financing for the modification of the LGMIS will be covered under retroactive financing.**

17. **Taxation** As per the Fund's policy, none of the proceeds of its Financing can be utilized for the payment of Taxes during the course of project implementation. The Government of Yemen will cover the payment of taxes on all procurement (goods, services, works) undertaken by the project, according to the Financing Agreement. All accounting documents should clearly specify the amount of tax separately for expenditures incurred from all sources of financing.

18. **Internal Controls**: As the PMUs and PCU will be ring-fenced, the internal control mechanisms will be detailed within the Project Implementation Manual (PIM). The approval of the PIM will be conditional for the first replenishment. i.e. the first disbursement (advance) may be processed, however subsequent replenishments will be approved after the PIM has been approved.

19. **Staffing:** The PCU will have one finance manager and two accountants who will be responsible for the coordination and submission of all financial management and accounting related issues. The staff at the coordination unit will also include an Internal Auditor. Each Governorate PMU will be responsible for their financial management and accounting, and will be supported by a qualified accountant each. Detailed Terms of Reference of Financial Staff at all levels are included in the PIM.

20. **Financial Accounting and Reporting:** The Government of Yemen and all entities under maintain their accounts per IPSAS cash basis. The fiscal year for Yemen is January 1-December 31. The Governorate PMUs will generate quarterly financial reports to be submitted to the PCU. These consolidated reports, for all the sources of financing, will include:

- Statement of sources and uses of funds by category of expenditure;
- Statement of sources and uses of funds by project components indicating the funds received, cash forecast, expenditure report comparing actual and planned expenditures by activities;
- Contracts ledger and contract monitoring forms showing all contracts with amounts committed and disbursed.

21. Advances from the PCU to the PMU will be considered as expenditures only after the amounts have been completely expensed by the PMU.

22. Expenditures will be borne by the office that has incurred the same. Eg. All activities undertaken by Dhamar Governorate will be expensed by the Dhamar PMU. It will be the responsibility of the coordinating PMU to ensure that there is no build-up of idle funds in the Governorate accounts.

23. The PCU will submit consolidated financial reports for each quarter to IFAD and they will contain the information from the Governorates and include the sources and uses of the funds at this level. The quarterly report formats will be included in the PIM. After the first supervision it is possible that the project may be moved to report-based disbursements.

24. The annual audited financial statements of the operations, resources and expenditures related to the Project for each Fiscal Year, prepared in accordance with IPSAS cash basis, will be submitted to the Fund within six (6) months of the end of each Fiscal Year. The Project will be guided by the IFAD guidelines in the preparation of their annual financial statements.

25. **Internal audit:** While all line ministries in Yemen do have an internal audit function, the PEFA found that effectiveness and follow up is limited. An Internal Auditor will be hired at the PCU who will work with the entire project. To ensure independence from the management, the Internal Auditor will report to the National Steering Committee. The Internal Auditor will be hired competitively and the TORs must be cleared by IFAD. The detailed functions of the Internal Auditor will be defined within the PIM.

26. **External Audit:** The Project's financial statements will be audited by an independent private sector auditing firm. The external auditor will be chosen from the list approved by Central Organisation for Controlling and Auditing (COCA – the Supreme Auditor) and IFAD. TORs, to ensure that all financiers' requirements are being met, will be harmonized and presented to IFAD for approval. The

fiscal year end of RGP will be December 31, therefore, the audited financial statements are due at IFAD no later than June 30 (within six months). The audit report will contain a separate management letter with an opinion on the Internal Control systems of RGP and related audit observations; separate opinions on certified Statements of Expenditure (SOE), the Special Account and the Project Financial statements; a statement as to the adequacy of the accounting system and internal controls and whether IFAD funds have been used for their intended purpose; a confirmation that SOEs correctly reflect the expenditures incurred; and commencing with the second year audit a follow-up on the implementation of prior year recommendations. Submission of the audit report after the due date, of six months after fiscal year end, may result in suspension of the financing.

27. **Withdrawals from the Financing Accounts:** Between the date of entry into force of the Financing Agreement and the Financing Closing Date, the PCU may request withdrawals from the Loan Account and/or Grant Account of amounts paid or to be paid for Eligible Expenditures. The Fund shall notify the PCU of the minimum amount for withdrawals.

28. No withdrawal shall be made from the Loan and/or Grant Accounts until the first AWPB has been approved by the Fund and the Fund has determined that all other conditions specified in the Financing Agreement as additional general conditions precedent to withdrawal have been fulfilled. The Financing Agreement may also establish additional specific conditions precedent to withdrawal applicable to particular categories or activities. Withdrawals to meet the costs of starting up the Project may be made from the date of entry into force of the Agreement, subject to any limits established in the Financing Agreement.

29. When the PCU wishes to request a withdrawal from the Loan and/or Grant Accounts or a Special Commitment, the PCU shall deliver electronically, via the Loans and Grants Management Information System (LGMIS) the application to MOF and MOPIC, who will then forward the same to the Fund, together with such documents and other evidence in support of such application as the Fund shall reasonably request.

30. The PCU shall furnish to the Fund satisfactory evidence of the authority of the person or persons authorised to sign such applications and the authenticated specimen signature of each such person. Under the provisions of the General Conditions (article IV, section 4.04(b)), the Fund requires the borrower's (or recipient's) representative, as designated in the financing agreement, to furnish satisfactory evidence of the authority and authenticated specimen signatures of the individuals who will sign WAs on behalf of the borrower. This evidence must reach the Fund before the first WA is presented by the borrower and should be the original (photocopies, facsimiles or other means of transmission are not acceptable). A sample template is provided in annex 1 to the Loan Disbursement Handbook. In order to avoid delays in disbursements, this documentary evidence should be furnished to IFAD as soon as possible after entry into force of the financing agreement.

31. Each WA should be signed by such duly authorized individuals, and the Fund must be notified of any change in the signatories authorized to withdraw funds from the loan/grant account. The Fund must also be notified of the designated signatories for operating any designated and/or programme or other accounts, including changes thereto, whether or not these authorized signatories are included in the financing agreement. Such changes, as effected during the life of the project, must be communicated promptly to the Fund.

32. If the PCU requests a withdrawal from the Loan and/or Grant Accounts for amounts to be paid thereafter for Eligible Expenditures, the Fund may, before transferring such amount to the PCU, require that the PCU provide evidence satisfactory to the Fund showing that previous withdrawals have been properly spent for Eligible Expenditures. The Fund may place reasonable limits on the amount that the PCU may withdraw in advance or the overall balance of such advance withdrawals, and may require that such amounts be held in a freely convertible currency and/or be held in an account designated for that purpose in a bank acceptable to the Fund.

33. Items to be financed are usually grouped into categories of expenditures and are shown as a schedule in the financing agreement. The financing schedule presents the amount allocated to each

category and subcategory, and the percentage of financing of eligible project expenditures as assessed at the time of project design and approved by IFAD's Senior Management. Reallocation of funds from one category to another may be allowed, unless the financing agreement prohibits this. During project implementation, should the need to reallocate financing resources among categories of expense arise, such reallocation would be processed in the applicable schedule(s) to the financing agreement after prior consultation and agreement between the borrower and the Fund.

34. **Retroactive Financing**. To establish the preparatory framework conditions for the RGP on the ground and ensure the quick commencement of its implementation, subsequent to the board approval of the project, it was agreed that the equivalent of USD$ 400,000 will be retroactively financed to implement the following specific activities:

- Recruitment of the key staff;
- Installation and deployment of the accounting systems;
- Alternations to LGMIS;
- Recruitment of a consultant for the preparation of the PIM;
- Mobilization and sensitization of the communities in Dahmar and Dahala.

35. The above expenditures will only be eligible for retroactive financing and thus reimbursed to the Borrower/Recipient after entry into force of the FA and satisfactory compliance with any conditions precedent to disbursement. Expenditures will become eligible for retroactive financing after the Project has been approved by QA.

36. To be eligible for retroactive financing, expenditures need to be specifically identified as retroactive financing in the project Work Plan and Budget for goods, works and services. This will include the related Procurement plan that will provide a detailed description of planned activities, related methods of procurement, quantities, estimated costs and the expected dates of finalization of Procurement activities. Both the specific WPB and Procurement Plan is subject to prior review by IFAD CPM. The expenditures must, of course, fall within the project description and within one or more of the eligible categories.

37. Detailed withdrawal procedures, forms and templates will be provided electronically and are available in IFAD's Loan Disbursement Handbook and will be in the Project Implementation Manual.

38. The mission has reached the conclusion that financial management risk is rated at **high** due to the inherent country risk. To mitigate this risk the following are recommended – (1) ring-fenced PMUs and PCU; (2) a full-time internal auditor at the PCU who reports to the National Board and not to the Project Director; (3) procurement and installation of a multi-lingual (Arabic/English) accounting software before implementation begins in the PMUs and PCU; (4) ensuring that sufficient accounting staff, with appropriate qualifications and experience, are recruited; and (5) approval of the PIM by IFAD, which will detail among other things the internal control mechanisms in place, as a condition for first replenishment. If the mitigation measures are in place when implementation begins, the residual financial management risk is rated at **medium** *(See Annex 3)*.

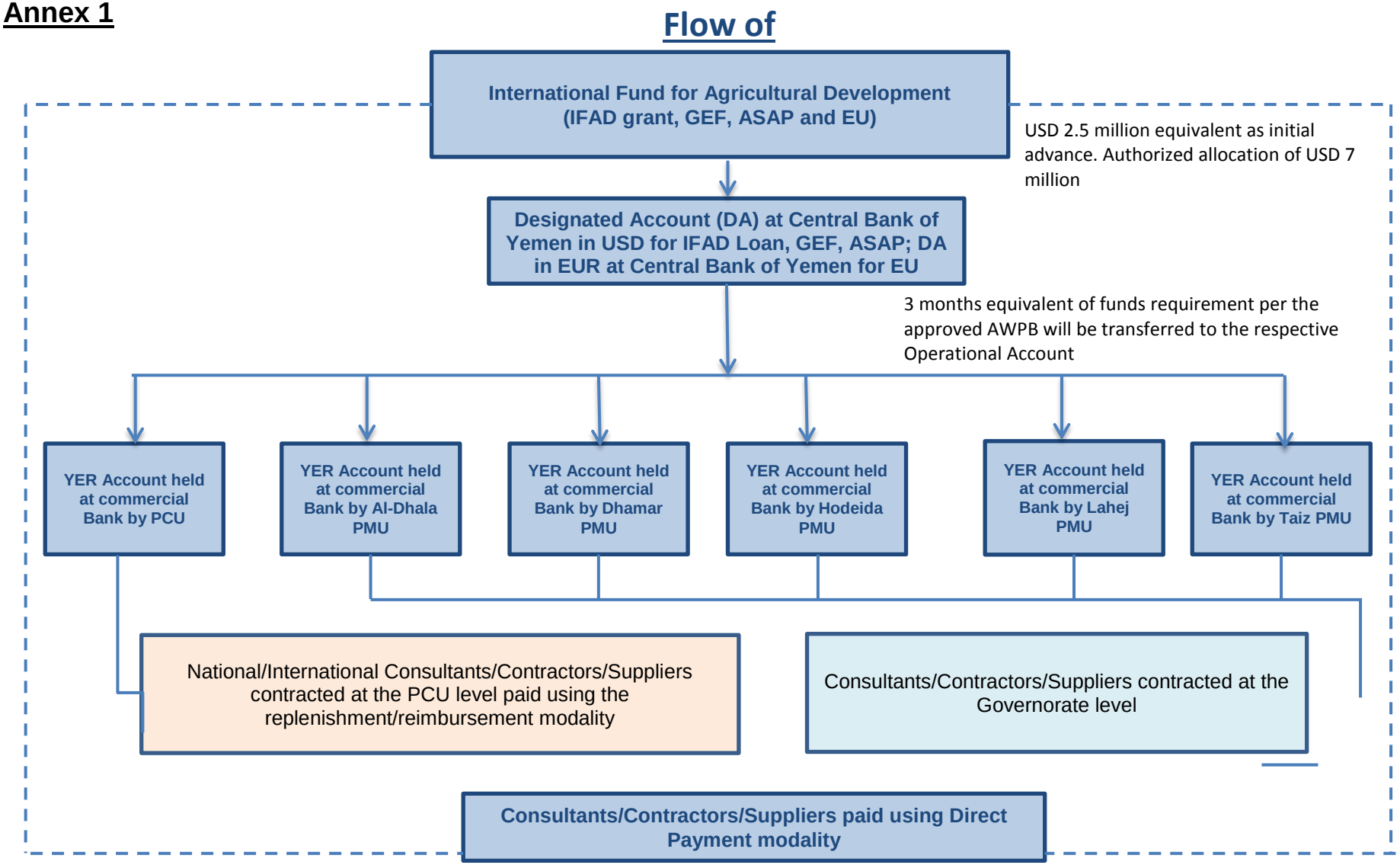
39. The Project should note **IFAD's Anti-corruption policy** where zero-tolerance applies where it has determined, through an investigation performed by the Fund, the borrower or another competent entity, that fraudulent, corrupt, collusive or coercive actions have occurred in projects financed through its loans and grants, and it shall enforce a range of sanctions in accordance with the provisions of applicable IFAD rules and regulations and legal instruments. 'Zero tolerance' means that IFAD will pursue all allegations falling under the scope of this policy and that appropriate sanctions will be applied where the allegations are substantiated. This policy applies to IFAD-funded activities whether supervised directly by the Fund or by a cooperating institution. The Fund will continue to improve its internal controls, including controls inherent in or pertaining to its project activities, so as to ensure that it is effective in preventing, detecting and investigating fraudulent, corrupt, collusive and coercive practices. The Fund shall take all possible actions to protect from reprisals individuals who help reveal

corrupt practices in its project or grant activities and individuals or entities subject to unfair or malicious allegations.

40. **Covenants for Financing Agreement:**

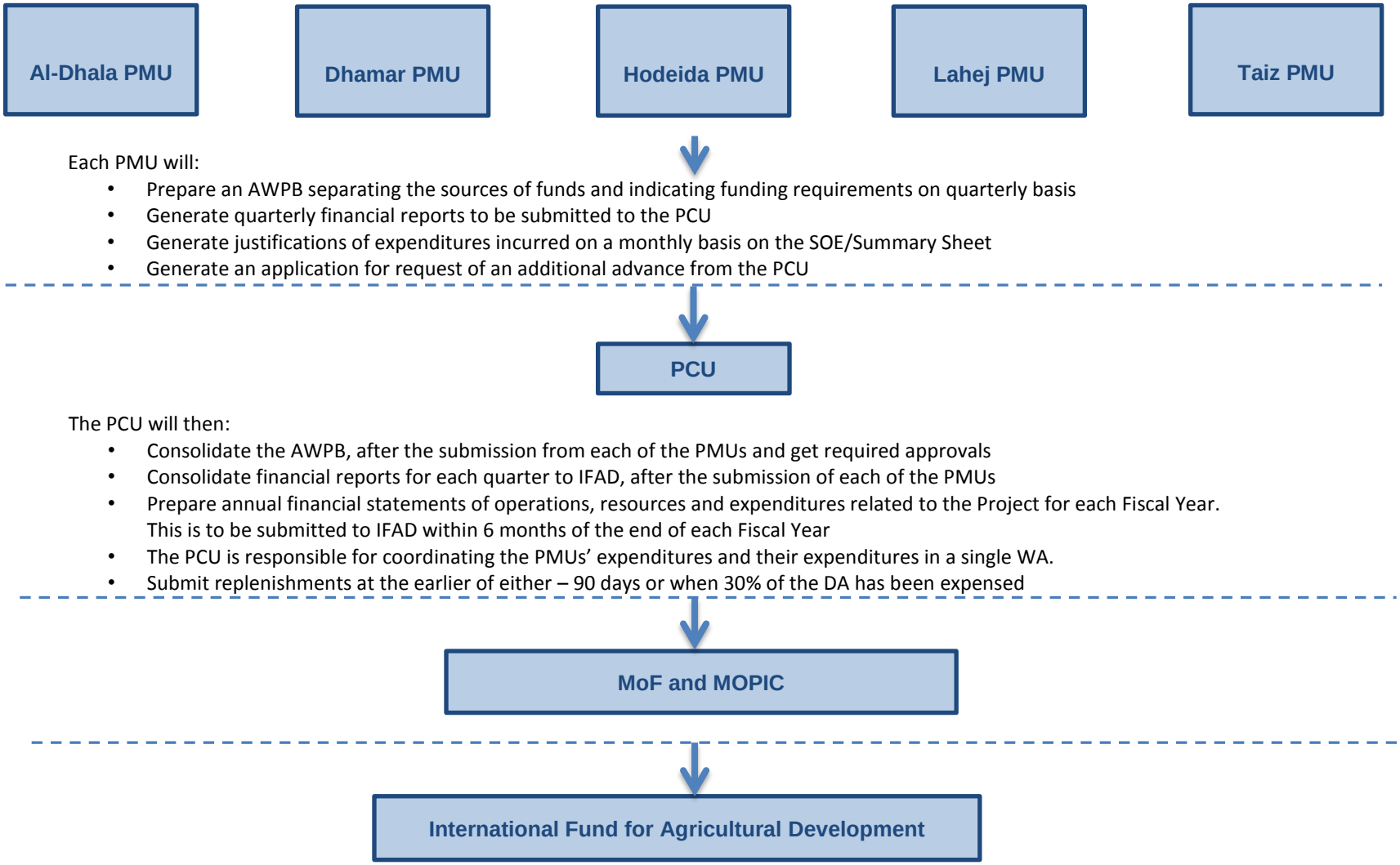
- Opening of the DA in USD and EUR by PCU.
- Opening of all YER operational accounts by PCU and PMUs.
- Recruitment and deployment of key project staff.
- Installation and deployment of the accounting system at the PCU and PMUs.
- Modification and deployment of LGMIS to allow submission by all PMUs to the PCU and to allow the PCU level of withdrawal application authorization before submission to MOPIC.
- PIM that has been approved by IFAD.

Annex 1


Flow of
International Fund for Agricultural Development (IFAD grant, GEF, ASAP and EU)
USD 2.5 million equivalent as initial advance. Authorized allocation of USD 7 million
Designated Account (DA) at Central Bank of Yemen in USD for IFAD Loan, GEF, ASAP; DA in EUR at Central Bank of Yemen for EU
3 months equivalent of funds requirement per the approved AWPB will be transferred to the respective Operational Account
YER Account held at commercial Bank by PCU
YER Account held at commercial Bank by Al-Dhala PMU
YER Account held at commercial Bank by Dhamar PMU
YER Account held at commercial Bank by Hodeida PMU
YER Account held at commercial Bank by Lahej PMU
YER Account held at commercial Bank by Taiz PMU
National/International Consultants/Contractors/Suppliers contracted at the PCU level paid using the replenishment/reimbursement modality
Consultants/Contractors/Suppliers contracted at the Governorate level
Consultants/Contractors/Suppliers paid using Direct Payment modality

Annex 2

Flow of Financial Reports and WAs



Attachment 3

Summary of Programme Fiduciary Risk Assessment at Design[27]

Project: Rural Growth Programme

Implementing Agency: Ministry of Agriculture and Irrigation

Implementing Entity: Governorate PMUs reporting to a NPCU in Sana'a

	Initial Risk Assessment					Proposed Mitigation	Final Risk Rating
Inherent Risk							
1. TI Index	**2.3**					Independent, ring fenced PMU/NPCU	**M**
2. RSP Score	**3.25**						
Control Risks	**EOP**	**PMUs (Dhamar , Al Dhala)**	**AFPPF**	**CRU**	**Overall**		
1. Organization and Staffing	**L**	**H**	**H**	**M**	**H**	Staff with the appropriate qualifications will be hired on a competitive basis	**M**
2. Budgeting	**L**	**M**	**M**	**M**	**M**	Structures are in place, in the implementing arrangements for the preparation and approval of the AWPB. Comparisons of AWPB to actual performance will be able to indicate any over-inflated budgeting that may occur.	**L**
3. Funds flow and Disbursement Arrangements	**L**	**M**	**H**	**H**	**H**	Funds will be held at the Central Bank of Yemen and will be controlled by the Coordinating Unit for disbursement to the Governorates based on their justification of actual expenditures incurred. Funds at the Governorate level will be held in commercial banks to ensure that regular banking transactions can be facilitated and to encourage the use of bank transfers instead of the use of cash	**M**

[27] This is a summary of the FMAQs that were conducted for EOP, PMU Dhamar, PMU Al-Dhala, CRU, AFPPF

4. Internal Controls	**M**	**H**	**H**	**M**	**H**	Preparation and approval by IFAD, of the PIM, will be a condition for disbursement. Internal control arrangements will be detailed in the PIM	**M**
5, Accounting Systems, Policies & Procedures	**L**	**M**	**H**	**M**	**M**	A single accounting system that links the PMUs to the NPCU will be in place before disbursements can begin. It is cited as a condition for disbursement. Policies and procedures will be detailed in the PIM.	**L**
6. Reporting and Monitoring	**L**	**M**	**H**	**H**	**H**	Consolidated quarterly financial reporting (with reporting formats in the PIM) will be expected by IFAD from the NPCU. The NPCU will be responsible to coordinate the 5 PMUs to report quarterly.	**M**
7. Internal Audit	**M**	**H**	**H**	**H**	**H**	An internal auditor will be hired at the NPCU. TORs of the auditor will be cleared with IFAD, detailed job requirements will be in the PIM	**M**
8. External Audit	**NA**	**H**	**H**	**H**	**H**	The WB list of the top-tier auditors in Yemen will be used. A consolidated audit, for all financiers, and for the entire programme will be conducted.	**M**
Project Fiduciary Risk @ Design	**L**	**H**	**H**	**H**	**H**		**M**

Appendix 8: Procurement

1. The Procurement Capacity of the Implementing Partners. An assessment of the adequacy of the Public Procurement Law (No.23) and procurement capacities of the potential implementing partners (PWP and CRU) was carried out. A lot of progress has been made in the recent past to develop the Procurement Law which is considered largely consistent with IFAD Procurement Guidelines. However, there are still some reported gaps in the implementation of the law. According to the WB experience, national tender documents are used for all NCB tenders but with an inclusion of a section on 'fraud and anti-corruption'; IFAD will require the same.

2. While PWP and CRU have had experience in implementing infrastructure-related projects inclusive of tendering and contracting processes, their experiences (volume, involvement), staffing and capacities vary. Community driven works were largely done by the Social Fund for Development (SFD) in the past. Efforts to enhance capacities of handling community-driven works are being made, with PWP hiring more staff and conducting a series of specialised trainings. The CRU, through their experience in implementing the IFAD-financed Community Based Rural Infrastructure Project, have gained some experience with limited staffing (1 Procurement Assistant). However, both agencies depend largely on consultants to deliver their programme of work. Consequently, implementing partners will be expected to competitively bid for tenders. It is also foreseen that there would be a certain amount of procurement both locally and community-based.

3. Goods, Works and Services. The procurement of goods, works and services to be financed out of the proceeds of IFAD financing will be carried out by each PCU or PMUs for goods, works and services that will be implemented in all governorates in accordance with IFAD's Procurement Guidelines and by observing the following specific principles:

- Procurement will be carried out in accordance with Financing Agreement and any duly agreed amendments thereto;
- Procurement will be conducted within the Programme implementation period, except as provided under Article 4.10(a)(ii) of IFAD General Conditions;
- The cost of the procurement is not to exceed the availability of duly allocated funds as per the Financing Agreement;
- Procurement is to be consistent with the duly approved annual work plan and budget (AWP/B) including a procurement plan for at least 18 months;
- Procurement is to result in the best value of money.

4. In addition, the procurement of goods, works and services will be carried out in accordance with the guidelines of Government and/or IsDB.

5. All goods, works and services procured will be exempt from duties and taxes.

6. The following methods are recommended:

7. Works. The procurement of works will largely be carried out under National Competitive Bidding. The International Competitive Bidding will be applied for contracts estimated to cost USD 1million and above. The small community contracts with values below USD 25,000 may be carried out through community participation, as long as they are prior identified in the procurement plan.

8. Goods. Contracts for procurement of goods costing USD 200,000 or more will be awarded based on International Competitive Bidding; those costing USD 50 000 or more but less than USD 200, 000 will be based on National Competitive Bidding; while those costing less than USD 50 000 will be based on National Shopping.

9. Consulting Services. The Quality and Cost Base Selection will be the standard method applied unless otherwise approved. The following processes will apply: (i) Request for Proposal – for contracts with a value of USD 100,000 and above; and (ii) Request for Quotation - for contracts with a

value of less than USD 100,000. Contracts for procurement of individual consultancy or TA services will be based on National Shopping. These financial thresholds may be adjusted as appropriate, with prior IFAD approval, depending on the nature of the assignment. For audit firms (international and national), the WB list will apply.

10. Specific applicability for procurement items will be clearly identified in annual procurement plans.

11. In aligning with the IsDB, the following Prior Review thresholds are proposed:

- All tenders under ICB;
- Specifications, Statement of Requirements and Terms of Reference for goods, works and consulting services (where pre-approved standard bidding documents/ RFPs/ RFQs are used);
- 1st two complete tenders for works under each method and all contracts for works estimated to cost USD 225,000 equivalent or more;
- Bidding documents and award of any contract for 1st five goods' tenders under each method and all contracts estimated to cost USD 200,000 equivalent or more;
- The solicitation and award of any contract for consulting firms estimated to cost USD 100,000 equivalent or more and all consulting services for individuals;
- All foreign contracted training; and
- Any direct contracting or single-source selection.

12. In consideration of the proposed implementation arrangements and new staffing foreseen in the PCU and PMUs, capacity building and guidance on applying IFAD procedures during the start-up phase will be of essence. During the course of implementation, specialised procurement training for the procurement staff is foreseen. Further, the processes and procedures will be elaborated in the Project Implementation Manual and Letter to the Borrower.

13. Procedure. The PWP and CRU will be responsible and accountable for executing procurement in compliance with the stipulated procedures of financiers and Government. The bid evaluation committee will consist of each PMU or PCU staff and its composition will be determined depending on the nature of the contract. Each Programme Manager will be the signatory of all contracts. The award of any contract estimated to cost more than USD 100 000 equivalent, for any category of procurement, will be subject to prior review by IFAD in accordance with the provisions of the Procurement Guidelines.

14. Contracting. Contracts for civil works will be based on unit costs and bills of quantities, while contracts for services will be based on achievement of deliverables and compliance with milestones rather than based on inputs, to the extent feasible.

15. Service Providers. The programme will be managed by each governorate-level PMU and implemented by contracted service providers on performance related contracts. Service providers will include preselected public institutions or projects (such as PWP, CRU) and non-preselected private sector entities such as Community Development Associations, consultancy firms and microfinance institutions. Service providers not pre-selected will be procured on the basis of IFAD (or co-financiers') procurement guidelines.

Draft 24 month procurement plan

16. A programme's 24-month procurement plan has been drafted and is detailed in the following tables, which indicate the required procurement actions for civil works, goods and services, and financial instruments. These plans have been developed to allow up-front planning and to ensure economy and efficiency in processing and the delivery of the "right" goods, works and services at the "right" time.

17. The assumptions used in the preparation of these procurement plans are as follows: to the extent feasible, goods have been bulked into annual procurement packages; goods, works and consultancy services are intended for ownership and use by the EOF.

18. Similar items have been packaged together to avoid splitting of contracts to attain economies of scale and ensure efficiency and economy in the procurement process.

19. The procurement plan is based on the following concepts.

Reference	**A unique reference for the procurement contract**
Description	A description of the procurement contract
Estimated cost	This is the base cost and the expected physical and price contingencies for the procurement item.
Number of Packages	An estimate of the expected economical packages for the procurement items.
Procurement Method	The method of procurement as per the IFAD guidelines.
Start Date	The date the procurement has to be planned, including initial stages of establishing detailed requirements, preparation of bidding documents and gaining all the necessary approvals as Public Procurement Act.
Bid Opening Date	The expected date for opening of the bids.
Domestic Preference	Domestic preference will be applicable for all ICB contracts.
Prior Review	The award of any contract estimated to cost more than USD 100 000 equivalent, for whatever category of procurement, will be subject to prior review by IFAD in accordance with the provisions of the Procurement Guidelines.

Yemen Rural Growth Program Category 1 Civil Works Procurement Plan (24 months) (US$)

Category 1 Civil Works

Description	Comp. #	Unit	Quantities PY1	Quantities PY2	Unit Cost	PY1	PY2	Selection Method	Post/Prior Review	Fin. Rule
I. Investment Costs										
A. Drinking water										
1. Individual roof water harvesting										
Civil Works	2	VU	15	15	300 000	4 895 181	5 063 146	National Competitive Biding	Prior Review	EU (50%), BENEF (50%)
2. Boreholes										
Design	2	Unit	20	33	2 400	52 215	89 111	Quality &Cost base selection - request for quotation		IDB (80%), BENEF (20%)
Civil w orks	2	Unit	-	20	63 000	-	1 417 681	National Competitive Biding	Prior Review	IDB (80%), BENEF (20%)
Supervision	2	Unit	-	20	4 200	-	94 512	Quality &Cost base selection - request for quotation		
B. Soil and water conservation										
1. Water harvesting structures										
a. Large structures and conveyance										
Design	2	Unit	3	3	8 000	26 108	27 003	Quality &Cost base selection - request for quotation		IDB (100%)
Civil w orks	2	Unit		3	200 000		675 086	National Competitive Biding	Prior Review	IDB (100%)
Supervision	2	Unit	-	3	12 000		40 505	Quality &Cost base selection - request for quotation		
b. Small structures and conveyance										
Design	2	Unit	9	12	4 800	46 994	64 802	Quality &Cost base selection - request for quotation		IDB (100%)
Civil w orks	2	Unit	-	9	120 000	-	1 215 155	National Competitive Biding	Prior Review	IDB (100%)
Supervision	2	Unit	-	9	7 200	-	72 909	Quality &Cost base selection - request for quotation		IDB (100%)
c. Spate irrigation										
Design	2	unit	7	12	3 200	24 367	43 206	Quality &Cost base selection - request for quotation		IDB (100%)
Civil w orks	2	unit	-	7	80 000	-	630 080	National Competitive Biding	Prior Review	IDB (100%)
Supervision	2	unit	-	7	4 800	-	37 805	Quality &Cost base selection - request for quotation		IDB (100%)
2. Land conservation										
a. Terrasses rehabilitation	2	ha	-	160	3 100	-	558 071	National Competitive Biding	Prior Review	AFPPF (50%), BENEF (50%)
b. Wadi bank protection										
Design	2	ha	20	50	40	870	2 250			
Civil w orks	2	ha		20	1000		22 503	Quality &Cost base selection - request for quotation		EU (30%), AFPPF (50%), BENEF (20%
Supervision	2	ha		20	60		1 200			
C. Rangeland /a										
1. Investment	2	units	-	30	16000		540 069		Prior Review	GEF (100%)
D. Roads										
1. Design	2	km	53	78	1600	92 247	140 418	Quality &Cost base selection - request for Quotation /Proposal		EU (70%)
2. Civil w orks	2	km	-	53	40000	-	2 385 305	National Competitive Biding	Prior Review	EU (70%)
3. Supervision	2	km	-	53	2400	-	143 118	Quality &Cost base selection - request for Quotation /Proposal		EU (70%)

Yemen Rural Growth Program Category 2: Vehicles Procurement Plan (24 months) (US$)

Category 2: Vehicles

Description	Comp. #	Unit	PY1	PY2	Unit Cost	PY1	PY2	Selection Method	Prior /Post Review	Fin. Rule
I. Investment Costs										
A. Community Institutional Building										
Community Facilitators - vehicles /b	**1**	unit	25	9	27,000	669 822	246 900	National Competitive Biding	Prior Review	ASAP (100%)
A. Project management unit								National Competitive Biding	Prior Review	
Vehicles	**4**	unit	15	-	27,000	406 371	-			IAFD (100%)

/b Vehicles would be given back to the Ministry of Agriculture and Irrigation once the CFs teams would be no longer needed.

Yemen Rural Growth Program Category 3: Equipment Procurement Plan (24 months) (US$)

Category 3: Equipment

Description	Comp. #	Unit	PY1	PY2	Unit Cost	PY1	PY2	Selection Method	Prior /Post Review	Fin. Rule
I. Investment Costs										
A. Community Institutional Building										
Furniture for CDAs	1	unit	200	230	100	19 699	23 600	National Shopping	Post Review	ASAP (100%)
A. Extension support and inputs provision										
1. Village agriculture technicians (VAT)										
c. Veterinary kits	3	kit	80	170	1,500	118 195	261 657	National Shopping	Post Review	ASAP (100%)
2. VAT owned input supply stores										
a. Investment	3	store	-	130	2,000	-	266 787	National Shopping	Post Review	IAFD (30%), MFBIS (40%), BENEF (30%)
b. Seed supply for crop diversification (rainfed fodder)	3	lumpsum	-	97	44	-	4 357	National Shopping	Post Review	GEF (100%)
b. Working capital	3	lumpsum				-	61 566	National Shopping	Post Review	MFBIS (100%)
B. Irrigation efficiency										
1. Modern irrigation related to water harvesting structures	3	ha	105	135	3,000	310 262	415 572	National Shopping	Post Review	MFBIS (40%), AFPPF (40%), BENEF (20%)
2. Modern irrigation related to existing water harvesting structures	3	ha	280	-	3,000	827 365	-	National Shopping	Post Review	MFBIS (40%), AFPPF (40%), BENEF (20%)
3. Bubbler irrigation and mulching	3	ha	-	100	4,400	-	449 680	National Shopping	Post Review	MFBIS (40%), AFPPF (40%), BENEF (20%)
4. GR drip irrigation	3	ha	-	463	3,500	-	1 662 803			MFBIS (40%), AFPPF (40%), BENEF (20%)
5. GR drip irrigation, mulching and mesh protection		ha	-	62	4,700	-	299 007			MFBIS (40%), AFPPF (40%), BENEF (20%)
C. Crop diversification										
1. Green houses	3	units	900	1 250	5,000	4 432 313	6 413 154	National Shopping	Post Review	MFBIS (40%), AFPPF (40%), BENEF (20%)
2. Demonstration of crops/seeds climate change resilient	3	lumpsum				-	320 658	National Shopping	Prior Review	IAFD (60%), GEF (20%), ASAP (20%)
D. Research and development										
1. Green house unit for research station /a	3	unit	2	3	18,000	35 459	55 410			GEF (100%)
2. Support to AREA on alternative and potential crop research	3									
Post-harvest operation research	3	trial	3	5	15,000	44 323	76 958	National Shopping	Post Review	GEF (100%)
Development of alternative crops in qat areas	3	trial	4	4	25,000	98 496	102 610	National Shopping	Post Review	GEF (100%)
Development of non-conventional water resources for fodder, forest and industrial crops	3	trial	-	3	50,000	-	153 916	National Shopping	Post Review	GEF (100%)
Genetic improvement of drough and heat -tolerant varieties	3	trial	-	2	60,000	-	123 133	National Competivitie bidding	Prior Review	GEF (100%)
Improvement of management efficiency and utilisation of natural resources in the light of climate change	3	trial	2	2	30,000	59 098	61 566	National Shopping	Post Review	GEF (100%)
2. Equipment and material										
Desktop computers	4	unit	20	-	1,500	29 549	-	National Shopping	Post Review	IAFD (100%)
Laptop	4	unit	30	-	1,000	29 549	-	National Shopping	Post Review	IAFD (100%)
Projector	4	unit	5	-	600	2 955	-	National Shopping	Post Review	IAFD (100%)
Printer	4	unit	10	-	1,000	9 850	-	National Shopping	Post Review	IAFD (100%)
GPS	4	unit	10	-	600	8 865	-	National Shopping	Post Review	IAFD (100%)
Camera	4	unit	10	-	600	5 910	-	National Shopping	Post Review	IAFD (100%)
Office furnitures	4	unit	5	-	10,000	49 248	-	National Shopping	Post Review	IAFD (100%)

Yemen Rural Growth Program Category 4: TA and Services Procurement Plan (24 months) (US$)

Category 4: TA and Services

Description	Comp. #	Unit	PY1	PY2	Unit Cost	PY1	PY2	Selection Method	Post/Prior Review	Fin. Rule
I. Investment Costs										
A. Community Institutional Building										
Community Facilitators - capacity building /a	1	lumpsum	5	3	13,200	65 007	-	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
Community Facilitators - fees /c	1	pers month	120	192	1,000	590 975	837 301	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
Awareness campaign	1	lumpsum	5	-	15,000	73 872	-	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
Community Facilitators - drivers	1	pers/month	300	408	250	75 254	103 124	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
International TA /d	1	training	2.5	2.5	25,000	62 750	63 158	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
B. Women empowerment										
Literacy training course /e	1	lumpsum				408 758	748 030	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
Life-skills training /f	1	lumpsum				118 195	307 831	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
C. Livelihoods Improvement										
1. Women Savings and Credit Groups and Associations										
SCA and SCG international TA	1	pers month	4	3.	25,000	100 000	62 500	Quality &Cost base selection - request for Quotation /Proposal	Prior	IAFD (100%)
SCA and SCG national TA	1	pers month	15	15	3,000	42 012	39 244	Quality &Cost base selection - request for Quotation /Proposal	Prior	MFBIS (100%)
2. Income Generating Activities										
Capacity building of micro-entrepreneurs	1	lumpsum				93 361	87 209	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
Exposure visits	1	lumpsum				-	87 210	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
Value chain analysis	1	lumpsum	5	10		93 361	174 419	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
Fair participation	1	lumpsum				-	34 885	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (80%), BENEF (20%)
I. Investment Costs										
Boreholes -WUAs capacity building	2	session	8	12	15,000	118 195	184 699	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
B. Soil and water conservation										
1. Water harvesting structures										
a. Large structures and conveyance	2	session	**3**	**6**	15,000	44 323	92 349	Quality &Cost base selection - request for Quotation /Proposal	Prior	**GEF (100%)**
b. Small structures and conveyance	2		1	5	15,000	14 774	76 958	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
c. Spate irrigation	2		4	6	15000	59 097	92 349	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
2. Land Conservation										
LMAS Capacity building	2	session	4	11	15,000	59 097	169 307	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
C. Rangeland /a										
2. Protected rangelang training	2	session	5	10	10,000	49 247	102 610	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
D. Roads										
4. RMGs capacity building	2	km	3	8	15,000	44 323	123 132	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
I. Investment Costs										
A. Extension support and inputs provision										
1. Village agriculture technicians (VAT)										
a. Capacity building	3	session	85	173.	2,000	167 443	354 006	Quality &Cost base selection - request for Quotation /Proposal	Prior	ASAP (100%)
2. VAT owned input supply stores										
b. Seed supply for crop diversification	3	lumpsum		18		-	813	Quality &Cost base selection - request for Quotation /Proposal	Prior	GEF (100%)
d. Financial management training	3	lumpsum				-	41 044	Quality &Cost base selection - request for Quotation /Proposal	Prior	MFBIS (100%)
3. Studies										
Start-up workshop	4	lumpsum	5	-	10,000	49 248	-	Quality &Cost base selection - request for Quotation /Proposal	Prior	IAFD (100%)
Baseline survey	4	lumpsum	5	-	10,000	49 248	-	Quality &Cost base selection - request for Quotation /Proposal	Prior	IAFD (100%)
4. Capacity building										
Trainings	4	lumpsum				147 744	-	Quality &Cost base selection - request for Quotation /Proposal	Prior	IAFD (100%)
International TA	4	lumpsum				246 240	256 526	Quality &Cost base selection - request for Quotation /Proposal	Prior	IAFD (100%)
International TA for field managers	4	lumpsum	2.5	2.5	25,500	61 560	64 132	Quality &Cost base selection - request for Quotation /Proposal	Prior	IAFD (100%)

\a 2-month training for all CFs teams. Training carried out by PMU Gender and Community Development Specialist and Field Managers.

\b Vehicle would be given back to the Ministry of Agriculture and Irrigation once the CFs teams would be no longer needed

\c Comrpising of fees and travel expenses

\d Part-time for training the CFs teams and part-time for training the Field Managers (during the first year)

\e Service provider contract includes: 2 months to identify women in each VU to become teacher; 3 months training of teachers; 2 months/year supervision of training, and payments of teachers. SP monthly rate $ 5 000 (fees, per diem, travel expenses, and overh

\f Service provider contract includes: 1course per month during one year per VU. Lumpsum for the service provider: $ 5 000/month per batch of 40 VUs

Appendix 9: Programme cost and financing

A. Main Assumptions

1. **Introduction**. This section describes the assumptions underlying the derivation of estimated programme costs and financing. Given restrictions on field work due to security conditions, the Programme costs have been based on the data collected by collected by other ongoing and recently completed IFAD-financed projects in Yemen during design and implementation.

2. **Programme Period**. The proposed Programme will be financed and implemented over a seven-year period.

3. **Inflation**. Inflation rose to an average of 19.5% in 2011, reflecting fuel price rises and shortages of basic foodstuffs. However, the recent improvement in the security situation has helped to ease supply bottlenecks, and the consumer price index fell in the first months of 2013. Assuming the worst shortages are overcome, and with world commodity prices falling, the Economist Intelligence Unit (EIU) and the Central Bank forecast inflation should return close to their trend rate averaging 11% over 2012-13. Nonetheless, with the depreciation of the Yemeni Riyal expected to accelerate in the second half of the forecast period, the EIU expects average inflation to reach 13% in 2016. For the purpose of this analysis, annual local inflation rates have been set at 11% for the first year, 12% for the second year, and 13% afterwards. In line with the estimates made by the World Bank and EIU a foreign inflation rate of 0.8% has been used.

4. **Exchange Rate**. In the wake of the unrest that began in early 2011, the Yemeni Riyal has come under severe downward pressure, forcing the CBY to run down its reserves to protect the currency. With the external account set to return widening deficits over the forecast period, we expect Yemen to be forced to run down its foreign reserves to alarmingly low levels, reaching the equivalent of just 1.3 months of import cover by the end of the forecast period (although there is a possibility that outside balance-of-payments support could come from external donors). As a result, as forecasted by EIU, the CBY will be less able to protect the Yemeni Riyal, resulting in an accelerated depreciation of the currency, averaging YER 306.4 to USD 1.00 in 2016. However, a free float of the currency is also a possibility, if the CBY chooses to protect its foreign-currency reserves at the expense of the Yemeni Riyal. The base exchange rate for this analysis has been set at YER 225 to USD 1.00 at data collection, with a further progressing depreciation during the whole Programme period, reaching YER 361 to USD 1.00 at the end of the Programme.

5. **Price and Physical Contingencies**. Price contingencies are calculated on the basis of estimated inflation rates and applied depending on the estimated percentage of local versus foreign currency element of each cost item. Price contingencies using the inflation parameters described above have been applied to most goods and services that will be procured under the programme. A physical contingency rate of 5% has been assumed for a limited portion of Programme costs in particular with respect to civil works as they have been estimated with reasonable certainty.

6. **Taxes and Duties**. The estimate of taxes and duties was based on the rates in effect at the time of the design of the Economic Opportunity Programme (2009) in conformity with the principle that no taxes or duties will be financed out by IFAD and cofinanciers. In line with the practice of externally financed projects in Yemen, the government will finance identifiable taxes and duties.

7. **Expenditure Accounts**. Almost all items procured under the Programme will be purchased locally. The foreign exchange allowance reflects the fact that vehicles, equipment and office supplies will be imported into Yemen. Programme's expenditures accounts have been limited to 3 investment expenditure accounts, namely: civil works, goods and services, and financial instruments and two recurrent cost accounts, namely: salaries and allowances and other operating costs.

8. **Programme Structure**. The Programme has three technical components and one management component. Budgets for each component are also broken down into the costs which will

be incurred by the five Governorate Programme Management Units and the National Programme Coordination Unit.

B. Programme costs

9. Total Programme Costs. The total programme costs including price and physical contingencies, duties and taxes are estimated at USD 127,4 million (YER 34.8 billion) over the seven-year implementation period as shown in Table 1. Total base costs amount to USD 120.0 million, while physical and price contingencies are estimated to add another USD 7,3 million (7% of the base costs) to this amount.

Table 1: Programme Costs – Per Year

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
A. Community empowerment.								
Al Dhala	836,727.8	1,253,722.7	963,944.3	478,742.6	168,322.8	6,656.8	-	3,708,116.9
Dhamar	836,727.8	1,253,722.7	980,248.6	493,996.8	168,322.8	6,656.8	-	3,739,675.5
Hodeida	908,325.3	1,541,912.8	1,621,861.8	1,215,893.1	590,246.5	90,798.8	-	5,969,038.3
Lahej	910,812.9	1,540,691.2	1,621,861.8	1,215,893.1	590,246.5	90,798.8	-	5,970,304.3
Taiz	851,715.4	1,519,657.0	1,527,475.3	1,142,081.3	597,366.8	-	-	5,638,295.8
Subtotal	4,344,309.2	7,109,706.3	6,715,391.6	4,546,607.0	2,114,505.4	194,911.2	-	25,025,430.8
B. Natural Resources Management and Resilient Infrastructure								
Al Dhala	1,728,107.1	3,254,001.7	3,926,188.9	1,800,499.3	18,056.5	-	-	10,726,853.5
Dhamar	1,728,107.1	3,256,612.4	3,928,761.3	2,181,061.7	18,056.5	-	-	11,112,599.0
Hodeida	159,413.7	2,062,878.9	3,361,671.4	2,863,373.1	906,737.8	19,075.8	-	9,373,150.7
Lahej	170,707.0	2,219,542.7	3,683,709.8	3,147,988.3	1,105,657.1	19,075.8	-	10,346,680.6
Taiz	1,740,705.8	3,312,463.4	3,927,361.5	2,128,957.8	747,512.8	-	-	11,857,001.3
Subtotal	5,527,040.7	14,105,499.1	18,827,692.9	12,121,880.1	2,796,020.7	38,151.6	-	53,416,285.2
C. Agricultural Development								
Al Dhala	1,856,646.8	2,225,097.7	870,488.5	554,000.1	75,235.5	-	-	5,581,468.6
Dhamar	1,551,309.6	2,366,299.9	1,353,618.3	1,076,185.9	75,235.5	-	-	6,422,649.3
Hodeida	860,853.7	3,051,787.1	2,868,004.2	1,639,951.7	195,612.4	-	-	8,616,209.1
Lahej	875,628.1	2,919,805.4	2,734,570.1	1,367,654.2	75,235.5	-	-	7,972,893.3
Taiz	1,249,912.3	2,967,338.7	2,714,412.1	1,785,672.1	75,235.5	-	-	8,792,570.8
Subtotal	6,394,350.6	13,530,328.8	10,541,093.3	6,423,463.9	496,554.5	-	-	37,385,791.1
D. Project Management								
Al Dhala	382,474.6	234,157.1	211,229.6	189,082.8	217,520.9	171,046.4	207,877.8	1,613,389.3
Dhamar	382,474.6	234,157.1	211,229.6	189,082.8	217,520.9	171,046.4	207,877.8	1,613,389.3
Hodeida	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
Lahej	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
Taiz	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
NPCU	480,078.9	594,935.5	617,714.5	875,577.8	327,786.1	244,043.2	312,018.6	3,452,154.6
Subtotal	2,392,451.7	1,765,720.9	1,754,814.3	1,820,991.9	1,415,390.9	1,099,275.4	1,351,407.7	11,600,052.8
Total PROJECT COSTS	18,658,152.2	36,511,255.1	37,838,992.1	24,912,942.9	6,822,471.5	1,332,338.3	1,351,407.7	127,427,559.8

10. Programme Cost by Component. Programme investments are organized into four components: (i) Community empowerment; (ii) Natural Resources Management; (iii) Agricultural development; (iv) Project Management.

Table 2: Programme Costs Summary by Component

	(YER)			(US$)		
	Local	Total	% Total Base Costs	Local	Total	% Total Base Costs
A. Community empowerment.						
Al Dhala	911,970,000.0	935,370,000.0	3	4,053,200.0	4,157,200.0	3
Dhamar	920,970,000.0	944,370,000.0	3	4,093,200.0	4,197,200.0	3
Hodeida	1,475,167,500.0	1,517,332,500.0	6	6,556,300.0	6,743,700.0	6
Lahej	1,431,427,500.0	1,517,332,500.0	6	6,361,900.0	6,743,700.0	6
Taiz	1,350,112,500.0	1,436,017,500.0	5	6,000,500.0	6,382,300.0	5
Subtotal	6,089,647,500.0	6,350,422,500.0	24	27,065,100.0	28,224,100.0	24
B. Natural Resources Management and Resilient Infrastructure						
Al Dhala	1,703,160,000.0	2,103,075,000.0	8	7,569,600.0	9,347,000.0	8
Dhamar	1,757,970,000.0	2,173,275,000.0	8	7,813,200.0	9,659,000.0	8
Hodeida	1,456,596,000.0	1,788,120,000.0	7	6,473,760.0	7,947,200.0	7
Lahej	1,609,794,000.0	1,972,867,500.0	7	7,154,640.0	8,768,300.0	7
Taiz	1,867,140,000.0	2,306,362,500.0	9	8,298,400.0	10,250,500.0	9
Subtotal	8,394,660,000.0	10,343,700,000.0	38	37,309,600.0	45,972,000.0	38
C. Agricultural Development						
Al Dhala	1,216,793,250.0	1,216,793,250.0	5	5,407,970.0	5,407,970.0	5
Dhamar	1,381,680,000.0	1,381,680,000.0	5	6,140,800.0	6,140,800.0	5
Hodeida	1,823,612,400.0	1,823,612,400.0	7	8,104,944.0	8,104,944.0	7
Lahej	1,694,041,200.0	1,694,041,200.0	6	7,529,072.0	7,529,072.0	6
Taiz	1,868,184,900.0	1,868,184,900.0	7	8,303,044.0	8,303,044.0	7
Subtotal	7,984,311,750.0	7,984,311,750.0	30	35,485,830.0	35,485,830.0	30
D. Project Management						
Al Dhala	308,970,000.0	325,372,500.0	1	1,373,200.0	1,446,100.0	1
Dhamar	308,970,000.0	325,372,500.0	1	1,373,200.0	1,446,100.0	1
Hodeida	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
Lahej	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
Taiz	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
NPCU	686,992,500.0	697,927,500.0	3	3,053,300.0	3,101,900.0	3
Subtotal	2,248,717,500.0	2,341,665,000.0	9	9,994,300.0	10,407,400.0	9
Total BASELINE COSTS	24,717,336,750.0	27,020,099,250.0	100	109,854,830.0	120,089,330.0	100
Physical Contingencies	779,616,000.0	974,520,000.0	4	3,464,960.0	4,331,200.0	4
Price Contingencies	6,259,069,524.4	6,808,868,754.3	25	2,856,670.9	3,007,029.8	3
Total PROJECT COSTS	31,756,022,274.4	34,803,488,004.3	129	116,176,460.9	127,427,559.8	106

11. **Programme costs by expenditure categories**. Civil works, vehicles, equipment, TA and services account for 36%, 1%, 29%, 2% and 9% respectively of the total base costs of the Programme. A further 17% is accounted for by the financial instruments. Investments costs represent 94% of the total base costs of the Programme. Recurrent costs represent 6% of the total base costs of the Programme with salaries and allowances accounting for 5% and Operation and Maintenance costs representing 1% of the total base costs of the Programme.

Table 3: Programme Costs by Expenditure Categories

	(YER)				(US$)			
	Local	Total	% Foreign Exchange	% Total Base Costs	Local	Total	% Foreign Exchange	% Total Base Costs
I. Investment Costs								
A. Civil works	7,796,160,000.0	9,745,200,000.0	20	36	34,649,600.0	43,312,000.0	20	36
B. Vehicles	30,240,000.0	302,400,000.0	90	1	134,400.0	1,344,000.0	90	1
C. Equipment and material	7,822,086,750.0	7,822,086,750.0	-	29	34,764,830.0	34,764,830.0	-	29
D. TA								
National TA	583,200,000.0	583,200,000.0	-	2	2,592,000.0	2,592,000.0	-	2
International TA	-	81,562,500.0	100	-	-	362,500.0	100	-
Subtotal	583,200,000.0	664,762,500.0	12	2	2,592,000.0	2,954,500.0	12	2
E. Studies, trainings and workshops	2,466,135,000.0	2,466,135,000.0	-	9	10,960,600.0	10,960,600.0	-	9
F. Financial instruments	4,488,885,000.0	4,488,885,000.0	-	17	19,950,600.0	19,950,600.0	-	17
Total Investment Costs	23,186,706,750.0	25,489,469,250.0	9	94	103,052,030.0	113,286,530.0	9	94
II. Recurrent Costs								
A. Salaries and allowances	1,293,435,000.0	1,293,435,000.0	-	5	5,748,600.0	5,748,600.0	-	5
B. Operation and maintenance	237,195,000.0	237,195,000.0	-	1	1,054,200.0	1,054,200.0	-	1
Total Recurrent Costs	1,530,630,000.0	1,530,630,000.0	-	6	6,802,800.0	6,802,800.0	-	6
Total BASELINE COSTS	24,717,336,750.0	27,020,099,250.0	9	100	109,854,830.0	120,089,330.0	9	100
Physical Contingencies	779,616,000.0	974,520,000.0	20	4	3,464,960.0	4,331,200.0	20	4
Price Contingencies	6,259,069,524.4	6,808,868,754.3	8	25	2,856,670.9	3,007,029.8	5	3
Total PROJECT COSTS	31,756,022,274.4	34,803,488,004.3	9	129	116,176,460.9	127,427,559.8	9	106

C. Programme financing

12. The programme will be financed by: IFAD resources of USD 15.0 million in the form of a grant (11.8% of total costs); Islamic Development Bank resources of USD 15.0 million in the form of a loan (11.8%); European Union resources of USD 16.0 million equivalent in the form of a grant (12.7%); Global Environment Facility resources of USD 10.0 million (7.9%); Adaptation for Smallholder Agriculture Programme resources of USD 10.0 million (7.9%); microfinance banks/institutions' contribution of USD 17.7 million (13.9%); Agriculture and Fisheries Production Promotion Fund resources of USD 12.7 million (10.0%); beneficiaries' contribution of USD 20.9 million mainly in-kind (16.5%), and Government resources of USD 9.3 million (7.3%). The Government's contribution covers the cost of duties and taxes as well as some investment costs for roads.

Table 4: Programme Financing Plan (USD '000) - by Component

	IFAD		ASAP		GEF		IDB		EU		MFBIs		AFPPF		The Government		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
A. Community empowerment.																				
Al Dhala	776	20.9	932	25.1	451	12.2	-	-	-	-	889	24.0	-	-	8	0.2	652	17.6	3,708	2.9
Dhamar	844	22.6	932	24.9	415	11.1	-	-	-	-	889	23.8	-	-	8	0.2	652	17.4	3,740	2.9
Hodeida	1,106	18.5	1,567	26.3	723	12.1	-	-	-	-	1,361	22.8	-	-	13	0.2	1,198	20.1	5,969	4.7
Lahej	1,106	18.5	1,553	26.0	723	12.1	-	-	-	-	1,361	22.8	-	-	28	0.5	1,198	20.1	5,970	4.7
Taiz	1,106	19.6	1,547	27.4	483	8.6	-	-	-	-	1,277	22.7	-	-	28	0.5	1,197	21.2	5,638	4.4
Subtotal	4,937	19.7	6,532	26.1	2,796	11.2	-	-	-	-	5,779	23.1	-	-	86	0.3	4,896	19.6	25,025	19.6
B. Natural Resources Management and Resilient Infrastructure																				
Al Dhala	-	-	-	-	636	5.9	2,385	22.2	3,613	33.7	-	-	384	3.6	906	8.5	2,803	26.1	10,727	8.4
Dhamar	-	-	-	-	644	5.8	2,385	21.5	3,613	32.5	-	-	567	5.1	918	8.3	2,985	26.9	11,113	8.7
Hodeida	-	-	-	-	674	7.2	4,336	46.3	2,439	26.0	-	-	-	-	1,343	14.3	581	6.2	9,373	7.4
Lahej	-	-	-	-	852	8.2	3,899	37.7	2,439	23.6	-	-	582	5.6	1,396	13.5	1,178	11.4	10,347	8.1
Taiz	-	-	-	-	695	5.9	2,376	20.0	4,018	33.9	-	-	628	5.3	1,102	9.3	3,038	25.6	11,857	9.3
Subtotal	-	-	-	-	3,501	6.6	15,383	28.8	16,121	30.2	-	-	2,160	4.0	5,665	10.6	10,585	19.8	53,416	41.9
C. Agricultural Development																				
Al Dhala	203	3.6	492	8.8	325	5.8	-	-	-	-	1,856	33.3	1,518	27.2	380	6.8	807	14.5	5,581	4.4
Dhamar	409	6.4	287	4.5	427	6.6	-	-	-	-	2,128	33.1	1,790	27.9	439	6.8	943	14.7	6,423	5.0
Hodeida	234	2.7	454	5.3	994	11.5	-	-	-	-	2,461	28.6	2,630	30.5	587	6.8	1,257	14.6	8,616	6.8
Lahej	234	2.9	454	5.7	879	11.0	-	-	-	-	2,542	31.9	2,163	27.1	541	6.8	1,160	14.6	7,973	6.3
Taiz	577	6.6	454	5.2	379	4.3	-	-	-	-	2,909	33.1	2,530	28.8	599	6.8	1,344	15.3	8,793	6.9
Subtotal	1,657	4.4	2,139	5.7	3,004	8.0	-	-	-	-	11,897	31.8	10,631	28.4	2,545	6.8	5,512	14.7	37,386	29.3
D. Project Management																				
Al Dhala	1,010	62.6	304	18.8	134	8.3	-	-	-	-	-	-	-	-	165	10.2	-	-	1,613	1.3
Dhamar	1,010	62.6	304	18.8	134	8.3	-	-	-	-	-	-	-	-	165	10.2	-	-	1,613	1.3
Hodeida	1,037	63.2	304	18.5	134	8.2	-	-	-	-	-	-	-	-	165	10.1	-	-	1,640	1.3
Lahej	1,037	63.2	304	18.5	134	8.2	-	-	-	-	-	-	-	-	165	10.1	-	-	1,640	1.3
Taiz	1,037	63.2	304	18.5	134	8.2	-	-	-	-	-	-	-	-	165	10.1	-	-	1,640	1.3
NPCU	3,252	94.2	-	-	-	-	-	-	-	-	-	-	-	-	200	5.8	-	-	3,452	2.7
Subtotal	8,384	72.3	1,520	13.1	670	5.8	-	-	-	-	-	-	-	-	1,026	8.8	-	-	11,600	9.1
Total PROJECT COSTS	14,978	11.8	10,191	8.0	9,971	7.8	15,383	12.1	16,121	12.7	17,676	13.9	12,792	10.0	9,323	7.3	20,993	16.5	127,428	100.0

Summary cost tables

Table 1: Components Programme Cost Summary

	(YER)			(US$)		
	Local	Total	% Total Base Costs	Local	Total	% Total Base Costs
A. Community empowerment.						
Al Dhala	911,970,000.0	935,370,000.0	3	4,053,200.0	4,157,200.0	3
Dhamar	920,970,000.0	944,370,000.0	3	4,093,200.0	4,197,200.0	3
Hodeida	1,475,167,500.0	1,517,332,500.0	6	6,556,300.0	6,743,700.0	6
Lahej	1,431,427,500.0	1,517,332,500.0	6	6,361,900.0	6,743,700.0	6
Taiz	1,350,112,500.0	1,436,017,500.0	5	6,000,500.0	6,382,300.0	5
Subtotal	6,089,647,500.0	6,350,422,500.0	24	27,065,100.0	28,224,100.0	24
B. Natural Resources Management and Resilient Infrastructure						
Al Dhala	1,703,160,000.0	2,103,075,000.0	8	7,569,600.0	9,347,000.0	8
Dhamar	1,757,970,000.0	2,173,275,000.0	8	7,813,200.0	9,659,000.0	8
Hodeida	1,456,596,000.0	1,788,120,000.0	7	6,473,760.0	7,947,200.0	7
Lahej	1,609,794,000.0	1,972,867,500.0	7	7,154,640.0	8,768,300.0	7
Taiz	1,867,140,000.0	2,306,362,500.0	9	8,298,400.0	10,250,500.0	9
Subtotal	8,394,660,000.0	10,343,700,000.0	38	37,309,600.0	45,972,000.0	38
C. Agricultural Development						
Al Dhala	1,216,793,250.0	1,216,793,250.0	5	5,407,970.0	5,407,970.0	5
Dhamar	1,381,680,000.0	1,381,680,000.0	5	6,140,800.0	6,140,800.0	5
Hodeida	1,823,612,400.0	1,823,612,400.0	7	8,104,944.0	8,104,944.0	7
Lahej	1,694,041,200.0	1,694,041,200.0	6	7,529,072.0	7,529,072.0	6
Taiz	1,868,184,900.0	1,868,184,900.0	7	8,303,044.0	8,303,044.0	7
Subtotal	7,984,311,750.0	7,984,311,750.0	30	35,485,830.0	35,485,830.0	30
D. Project Management						
Al Dhala	308,970,000.0	325,372,500.0	1	1,373,200.0	1,446,100.0	1
Dhamar	308,970,000.0	325,372,500.0	1	1,373,200.0	1,446,100.0	1
Hodeida	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
Lahej	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
Taiz	314,595,000.0	330,997,500.0	1	1,398,200.0	1,471,100.0	1
NPCU	686,992,500.0	697,927,500.0	3	3,053,300.0	3,101,900.0	3
Subtotal	2,248,717,500.0	2,341,665,000.0	9	9,994,300.0	10,407,400.0	9
Total BASELINE COSTS	24,717,336,750.0	27,020,099,250.0	100	109,854,830.0	120,089,330.0	100
Physical Contingencies	779,616,000.0	974,520,000.0	4	3,464,960.0	4,331,200.0	4
Price Contingencies	6,259,069,524.4	6,808,868,754.3	25	2,856,670.9	3,007,029.8	3
Total PROJECT COSTS	31,756,022,274.4	34,803,488,004.3	129	116,176,460.9	127,427,559.8	106

Table 2: Expenditure Accounts Programme Cost Summary (USD)

	(YER)				(US$)			
	Local	Total	% Foreign Exchange	% Total Base Costs	Local	Total	% Foreign Exchange	% Total Base Costs
I. Investment Costs								
A. Civil works	7,796,160,000.0	9,745,200,000.0	20	36	34,649,600.0	43,312,000.0	20	36
B. Vehicles	30,240,000.0	302,400,000.0	90	1	134,400.0	1,344,000.0	90	1
C. Equipment and material	7,822,086,750.0	7,822,086,750.0	-	29	34,764,830.0	34,764,830.0	-	29
D. TA								
National TA	583,200,000.0	583,200,000.0	-	2	2,592,000.0	2,592,000.0	-	2
International TA	-	81,562,500.0	100	-	-	362,500.0	100	-
Subtotal	583,200,000.0	664,762,500.0	12	2	2,592,000.0	2,954,500.0	12	2
E. Studies, trainings and workshops	2,466,135,000.0	2,466,135,000.0	-	9	10,960,600.0	10,960,600.0	-	9
F. Financial instruments	4,488,885,000.0	4,488,885,000.0	-	17	19,950,600.0	19,950,600.0	-	17
Total Investment Costs	23,186,706,750.0	25,489,469,250.0	9	94	103,052,030.0	113,286,530.0	9	94
II. Recurrent Costs								
A. Salaries and allowances	1,293,435,000.0	1,293,435,000.0	-	5	5,748,600.0	5,748,600.0	-	5
B. Operation and maintenance	237,195,000.0	237,195,000.0	-	1	1,054,200.0	1,054,200.0	-	1
Total Recurrent Costs	1,530,630,000.0	1,530,630,000.0	-	6	6,802,800.0	6,802,800.0	-	6
Total BASELINE COSTS	24,717,336,750.0	27,020,099,250.0	9	100	109,854,830.0	120,089,330.0	9	100
Physical Contingencies	779,616,000.0	974,520,000.0	20	4	3,464,960.0	4,331,200.0	20	4
Price Contingencies	6,259,069,524.4	6,808,868,754.3	8	25	2,856,670.9	3,007,029.8	5	3
Total PROJECT COSTS	31,756,022,274.4	34,803,488,004.3	9	129	116,176,460.9	127,427,559.8	9	106

Table 3: Expenditure Accounts by Components – Totals Including Contingencies (USD)

	Community empowerment.					Natural Resources Management and Resilient Infrastructure					Agricultural Development					Project Management						
	Al Dhala	Dhamar	Hodeida	Lahej	Taiz	Al Dhala	Dhamar	Hodeida	Lahej	Taiz	Al Dhala	Dhamar	Hodeida	Lahej	Taiz	Al Dhala	Dhamar	Hodeida	Lahej	Taiz	NPCU	Total
I. Investment Costs																						
A. Civil works	-	-	-	-	-	10,235,572.6	10,652,900.0	8,753,440.8	9,600,334.0	11,337,279.5	-	-	-	-	-	-	-	-	-	-	-	50,579,526.8
B. Vehicles	60,848.6	60,848.6	113,083.2	330,433.2	330,433.2	-	-	-	-	-	-	-	-	-	-	81,274.2	81,274.2	81,274.2	81,274.2	81,274.2	54,182.8	1,356,200.9
C. Equipment and material	12,804.5	12,804.5	20,808.1	20,808.1	20,808.1	-	-	-	-	-	5,426,451.1	6,267,631.8	8,378,859.7	7,735,543.9	8,555,221.3	27,184.9	27,184.9	27,184.9	27,184.9	27,184.9	27,184.9	36,614,850.1
D. TA																						
National TA	18,697.0	18,697.0	25,876.4	25,876.4	25,876.4	450,115.8	418,533.9	578,544.7	705,181.4	478,556.5	-	-	-	-	-	-	-	-	-	-	-	2,745,955.5
International TA	50,181.5	50,181.5	87,876.2	87,876.2	87,876.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	363,991.5
Subtotal	68,878.5	68,878.5	113,752.6	113,752.6	113,752.6	450,115.8	418,533.9	578,544.7	705,181.4	478,556.5	-	-	-	-	-	-	-	-	-	-	-	3,109,947.0
E. Studies, trainings and w o	1,091,935.8	1,091,935.8	1,898,949.4	1,682,865.5	1,442,731.4	41,165.2	41,165.2	41,165.2	41,165.2	41,165.2	155,017.4	155,017.4	237,349.5	237,349.5	237,349.5	252,286.3	252,286.3	279,270.1	279,270.1	279,270.1	1,873,671.5	11,652,381.9
F. Financial instruments	2,473,649.5	2,505,208.1	3,822,445.0	3,822,445.0	3,730,570.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16,354,318.1
Total Investment Costs	3,708,116.9	3,739,675.5	5,969,038.3	5,970,304.3	5,638,295.8	10,726,853.5	11,112,599.0	9,373,150.7	10,346,680.6	11,857,001.3	5,581,468.6	6,422,649.3	8,616,209.1	7,972,893.3	8,792,570.8	360,745.4	360,745.4	387,729.2	387,729.2	387,729.2	1,955,039.2	119,667,224.7
II. Recurrent Costs																						
A. Salaries and allow ances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,050,525.9	1,050,525.9	1,050,525.9	1,050,525.9	1,050,525.9	1,294,997.4	6,547,627.2
B. Operation and maintenanc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	202,118.0	202,118.0	202,118.0	202,118.0	202,118.0	202,118.0	1,212,707.9
Total Recurrent Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,252,643.9	1,252,643.9	1,252,643.9	1,252,643.9	1,252,643.9	1,497,115.4	7,760,335.1
Total PROJECT COSTS	3,708,116.9	3,739,675.5	5,969,038.3	5,970,304.3	5,638,295.8	10,726,853.5	11,112,599.0	9,373,150.7	10,346,680.6	11,857,001.3	5,581,468.6	6,422,649.3	8,616,209.1	7,972,893.3	8,792,570.8	1,613,389.3	1,613,389.3	1,640,373.2	1,640,373.2	1,640,373.2	3,452,154.6	127,427,559.8

Table 4: Programme Components by Year – Totals Including Contingencies (USD)

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
A. Community empowerment.								
Al Dhala	836,727.8	1,253,722.7	963,944.3	478,742.6	168,322.8	6,656.8	-	3,708,116.9
Dhamar	836,727.8	1,253,722.7	980,248.6	493,996.8	168,322.8	6,656.8	-	3,739,675.5
Hodeida	908,325.3	1,541,912.8	1,621,861.8	1,215,893.1	590,246.5	90,798.8	-	5,969,038.3
Lahej	910,812.9	1,540,691.2	1,621,861.8	1,215,893.1	590,246.5	90,798.8	-	5,970,304.3
Taiz	851,715.4	1,519,657.0	1,527,475.3	1,142,081.3	597,366.8	-	-	5,638,295.8
Subtotal	4,344,309.2	7,109,706.3	6,715,391.6	4,546,607.0	2,114,505.4	194,911.2	-	25,025,430.8
B. Natural Resources Management and Resilient Infrastructure								
Al Dhala	1,728,107.1	3,254,001.7	3,926,188.9	1,800,499.3	18,056.5	-	-	10,726,853.5
Dhamar	1,728,107.1	3,256,612.4	3,928,761.3	2,181,061.7	18,056.5	-	-	11,112,599.0
Hodeida	159,413.7	2,062,878.9	3,361,671.4	2,863,373.1	906,737.8	19,075.8	-	9,373,150.7
Lahej	170,707.0	2,219,542.7	3,683,709.8	3,147,988.3	1,105,657.1	19,075.8	-	10,346,680.6
Taiz	1,740,705.8	3,312,463.4	3,927,361.5	2,128,957.8	747,512.8	-	-	11,857,001.3
Subtotal	5,527,040.7	14,105,499.1	18,827,692.9	12,121,880.1	2,796,020.7	38,151.6	-	53,416,285.2
C. Agricultural Development								
Al Dhala	1,856,646.8	2,225,097.7	870,488.5	554,000.1	75,235.5	-	-	5,581,468.6
Dhamar	1,551,309.6	2,366,299.9	1,353,618.3	1,076,185.9	75,235.5	-	-	6,422,649.3
Hodeida	860,853.7	3,051,787.1	2,868,004.2	1,639,951.7	195,612.4	-	-	8,616,209.1
Lahej	875,628.1	2,919,805.4	2,734,570.1	1,367,654.2	75,235.5	-	-	7,972,893.3
Taiz	1,249,912.3	2,967,338.7	2,714,412.1	1,785,672.1	75,235.5	-	-	8,792,570.8
Subtotal	6,394,350.6	13,530,328.8	10,541,093.3	6,423,463.9	496,554.5	-	-	37,385,791.1
D. Project Management								
Al Dhala	382,474.6	234,157.1	211,229.6	189,082.8	217,520.9	171,046.4	207,877.8	1,613,389.3
Dhamar	382,474.6	234,157.1	211,229.6	189,082.8	217,520.9	171,046.4	207,877.8	1,613,389.3
Hodeida	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
Lahej	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
Taiz	382,474.6	234,157.1	238,213.5	189,082.8	217,520.9	171,046.4	207,877.8	1,640,373.2
NPCU	480,078.9	594,935.5	617,714.5	875,577.8	327,786.1	244,043.2	312,018.6	3,452,154.6
Subtotal	2,392,451.7	1,765,720.9	1,754,814.3	1,820,991.9	1,415,390.9	1,099,275.4	1,351,407.7	11,600,052.8
Total PROJECT COSTS	18,658,152.2	36,511,255.1	37,838,992.1	24,912,942.9	6,822,471.5	1,332,338.3	1,351,407.7	127,427,559.8

Table 5: Expenditure Accounts by Year – Totals Including Contingencies (USD)

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs								
A. Civil w orks	5,137,982.1	13,264,093.3	17,899,448.2	11,608,378.2	2,669,625.1	-	-	50,579,526.8
B. Vehicles	806,722.1	266,910.0	103,798.3	104,502.7	74,267.7	-	-	1,356,200.9
C. Equipment and material	6,454,039.1	13,149,028.3	10,217,287.0	6,297,941.2	496,554.5	-	-	36,614,850.1
D. TA								
National TA	381,823.1	778,039.5	901,179.2	520,366.3	126,395.7	38,151.6	-	2,745,955.5
International TA	162,750.0	125,657.5	75,584.0	-	-	-	-	363,991.5
Subtotal	544,573.1	903,697.0	976,763.2	520,366.3	126,395.7	38,151.6	-	3,109,947.0
E. Studies, trainings and w orkshops	2,645,598.5	3,256,445.7	2,755,591.7	1,833,772.4	867,917.0	50,868.8	242,187.8	11,652,381.9
F. Financial instruments	2,053,941.9	4,613,372.1	4,773,505.4	3,371,720.3	1,346,867.1	194,911.2	-	16,354,318.1
Total Investment Costs	17,642,857.0	35,453,546.4	36,726,393.7	23,736,681.2	5,581,627.0	283,931.7	242,187.8	119,667,224.7
II. Recurrent Costs								
A. Salaries and allow ances	866,960.5	903,177.3	950,047.7	1,004,409.7	1,059,556.9	856,885.4	906,589.5	6,547,627.2
B. Operation and maintenance	148,334.8	154,531.4	162,550.8	171,852.0	181,287.5	191,521.1	202,630.4	1,212,707.9
Total Recurrent Costs	1,015,295.2	1,057,708.7	1,112,598.5	1,176,261.7	1,240,844.4	1,048,406.6	1,109,220.0	7,760,335.1
Total PROJECT COSTS	18,658,152.2	36,511,255.1	37,838,992.1	24,912,942.9	6,822,471.5	1,332,338.3	1,351,407.7	127,427,559.8

Table 6: Components by Financiers (USD)

	IFAD		ASAP		GEF		IDB		EU		MFBIs		AFPPF		The Government		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
A. Community empowerment.																				
Al Dhala	775,958.0	20.9	931,799.5	###	451,476.5	12.2	-	-	-	-	889,414.1	24.0	-	-	7,960.3	0.2	651,508.5	17.6	3,708,116.9	2.9
Dhamar	843,630.7	22.6	931,799.5	###	415,362.4	11.1	-	-	-	-	889,414.1	23.8	-	-	7,960.3	0.2	651,508.5	17.4	3,739,675.5	2.9
Hodeida	1,105,688.4	18.5	1,567,395.2	###	723,169.2	12.1	-	-	-	-	1,361,374.7	22.8	-	-	13,253.9	0.2	1,198,156.9	20.1	5,969,038.3	4.7
Lahej	1,105,688.4	18.5	1,553,446.8	###	723,169.2	12.1	-	-	-	-	1,361,374.7	22.8	-	-	28,468.3	0.5	1,198,156.9	20.1	5,970,304.3	4.7
Taiz	1,105,688.4	19.6	1,547,260.8	###	483,035.0	8.6	-	-	-	-	1,277,232.7	22.7	-	-	28,468.3	0.5	1,196,610.4	21.2	5,638,295.8	4.4
Subtotal	4,936,653.9	19.7	6,531,701.9	###	2,796,212.3	11.2	-	-	-	-	5,778,810.4	23.1	-	-	86,111.1	0.3	4,895,941.2	19.6	25,025,430.8	19.6
B. Natural Resources Management and Resilient Infrastructure																				
Al Dhala	-	-	-	-	635,530.4	5.9	2,385,489.2	22.2	3,612,800.9	###	-	-	383,830.5	3.6	906,459.9	8.5	2,802,742.7	26.1	10,726,853.5	8.4
Dhamar	-	-	-	-	643,980.3	5.8	2,385,489.2	21.5	3,612,800.9	###	-	-	566,500.4	5.1	918,415.7	8.3	2,985,412.6	26.9	11,112,599.0	8.7
Hodeida	-	-	-	-	674,106.1	7.2	4,336,433.1	46.3	2,439,028.2	###	-	-	-	-	1,342,844.1	14.3	580,739.2	6.2	9,373,150.7	7.4
Lahej	-	-	-	-	852,336.2	8.2	3,899,166.7	37.7	2,439,028.2	###	-	-	582,023.1	5.6	1,395,715.3	13.5	1,178,411.1	11.4	10,346,680.6	8.1
Taiz	-	-	-	-	694,999.5	5.9	2,376,483.0	20.0	4,017,660.3	###	-	-	627,915.7	5.3	1,101,905.5	9.3	3,038,037.2	25.6	11,857,001.3	9.3
Subtotal	-	-	-	-	3,500,952.5	6.6	15,383,061.1	28.8	16,121,318.6	###	-	-	2,160,269.6	4.0	5,665,340.6	10.6	10,585,342.8	19.8	53,416,285.2	41.9
C. Agricultural Development																				
Al Dhala	203,483.1	3.6	491,655.8	8.8	325,459.8	5.8	-	-	-	-	1,856,029.8	33.3	1,517,807.4	27.2	379,851.6	6.8	807,181.1	14.5	5,581,468.6	4.4
Dhamar	408,634.6	6.4	286,504.3	4.5	426,792.1	6.6	-	-	-	-	2,128,416.1	33.1	1,790,193.7	27.9	438,734.2	6.8	943,374.2	14.7	6,422,649.3	5.0
Hodeida	233,989.2	2.7	453,577.6	5.3	994,110.2	11.5	-	-	-	-	2,461,177.2	28.6	2,629,985.1	30.5	586,520.2	6.8	1,256,849.7	14.6	8,616,209.1	6.8
Lahej	233,989.2	2.9	453,577.6	5.7	878,614.8	11.0	-	-	-	-	2,541,914.4	31.9	2,163,017.2	27.1	541,488.1	6.8	1,160,292.1	14.6	7,972,893.3	6.3
Taiz	576,964.5	6.6	453,577.6	5.2	379,379.7	4.3	-	-	-	-	2,909,338.3	33.1	2,530,441.1	28.8	598,865.5	6.8	1,344,004.0	15.3	8,792,570.8	6.9
Subtotal	1,657,060.6	4.4	2,138,893.0	5.7	3,004,356.7	8.0	-	-	-	-	11,896,875.7	31.8	10,631,444.5	28.4	2,545,459.5	6.8	5,511,701.1	14.7	37,385,791.1	29.3
D. Project Management																				
Al Dhala	1,010,192.3	62.6	304,084.0	###	133,942.1	8.3	-	-	-	-	-	-	-	-	165,171.0	10.2	-	-	1,613,389.3	1.3
Dhamar	1,010,192.3	62.6	304,084.0	###	133,942.1	8.3	-	-	-	-	-	-	-	-	165,171.0	10.2	-	-	1,613,389.3	1.3
Hodeida	1,037,176.1	63.2	304,084.0	###	133,942.1	8.2	-	-	-	-	-	-	-	-	165,171.0	10.1	-	-	1,640,373.2	1.3
Lahej	1,037,176.1	63.2	304,084.0	###	133,942.1	8.2	-	-	-	-	-	-	-	-	165,171.0	10.1	-	-	1,640,373.2	1.3
Taiz	1,037,176.1	63.2	304,084.0	###	133,942.1	8.2	-	-	-	-	-	-	-	-	165,171.0	10.1	-	-	1,640,373.2	1.3
NPCU	3,252,209.3	94.2	-	-	-	-	-	-	-	-	-	-	-	-	199,945.3	5.8	-	-	3,452,154.6	2.7
Subtotal	8,384,122.2	72.3	1,520,419.8	###	669,710.3	5.8	-	-	-	-	-	-	-	-	1,025,800.5	8.8	-	-	11,600,052.8	9.1
Total PROJECT COSTS	14,977,836.7	11.8	10,191,014.6	8.0	9,971,231.7	7.8	15,383,061.1	12.1	16,121,318.6	###	17,675,686.2	13.9	12,791,714.1	10.0	9,322,711.7	7.3	20,992,985.1	16.5	127,427,559.8	100.0

Table 7: Disbursement Accounts by Financiers (USD)

	IFAD		ASAP		GEF		IDB		EU		MFBIs		AFPPF		The Government		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
1. Civil works	-	-	-	-	2,973,945.7	5.6	15,383,061.1	###	16,121,318.6	###	-	-	2,160,269.6	4.1	5,579,603.9	10.6	10,585,342.8	20.0	52,803,541.7	41.4
2. Vehicles	428,315.3	41.7	537,240.2	52.2	-	-	-	-	-	-	-	-	-	-	62,667.8	6.1	-	-	1,028,223.3	0.8
3. Equipment and material	1,603,600.5	4.3	2,008,906.4	5.4	3,004,356.7	8.1	-	-	-	-	11,896,875.7	32.0	10,631,444.5	28.6	2,538,255.2	6.8	5,511,701.1	14.8	37,195,140.2	29.2
4. TA	1,975,253.2	73.5	138,810.0	5.2	485,841.5	18.1	-	-	-	-	-	-	-	-	85,736.7	3.2	-	-	2,685,641.4	2.1
5. Studies, trainings, worksho	1,445,952.9	15.6	5,184,087.9	55.8	2,598,245.5	28.0	-	-	-	-	-	-	-	-	57,050.6	0.6	-	-	9,285,336.9	7.3
6. Financial instruments	4,936,653.9	29.6	801,550.3	4.8	239,132.0	1.4	-	-	-	-	5,778,810.4	34.7	-	-	17,253.5	0.1	4,895,941.2	29.4	16,669,341.3	13.1
7. Salaries and allowances	3,779,589.0	57.7	1,116,183.8	17.0	669,710.3	10.2	-	-	-	-	-	-	-	-	982,144.1	15.0	-	-	6,547,627.2	5.1
8. Operation and maintenance	808,472.0	66.7	404,236.0	33.3	-	-	-	-	-	-	-	-	-	-	-0.0	-0.0	-	-	1,212,707.9	1.0
Total PROJECT COSTS	14,977,836.7	11.8	10,191,014.6	8.0	9,971,231.7	7.8	15,383,061.1	###	16,121,318.6	###	17,675,686.2	13.9	12,791,714.1	10.0	9,322,711.7	7.3	20,992,985.1	16.5	127,427,559.8	100.0

Table 8: Expenditure Accounts by Financiers (USD)

	IFAD		ASAP		GEF		IDB		EU		MFBIs		AFPPF		The Government		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
I. Investment Costs																				
A. Civil works	-	-	-	-	1,058,834.0	2.1	15,383,061.1	30.4	16,121,318.6	31.9	-	-	2,160,269.6	4.3	5,270,700.8	10.4	10,585,342.8	20.9	50,579,526.8	39.7
B. Vehicles	428,315.3	31.6	832,951.5	61.4	-	-	-	-	-	-	-	-	-	-	94,934.1	7.0	-	-	1,356,200.9	1.1
C. Equipment and material	1,808,752.0	4.9	1,361,009.2	3.7	3,004,356.7	8.2	-	-	-	-	11,767,012.8	32.1	10,598,978.8	28.9	2,563,039.5	7.0	5,511,701.1	15.1	36,614,850.1	28.7
D. TA																				
National TA	-	-	-	-	2,236,292.4	81.4	-	-	-	-	97,769.7	3.6	-	-	411,893.3	15.0	-	-	2,745,955.5	2.2
International TA	200,000.0	54.9	163,991.5	45.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	363,991.5	0.3
Subtotal	200,000.0	6.4	163,991.5	5.3	2,236,292.4	71.9	-	-	-	-	97,769.7	3.1	-	-	411,893.3	13.2	-	-	3,109,947.0	2.4
E. Studies, trainings and workshc	3,216,054.5	27.6	5,511,092.3	47.3	2,762,906.4	23.7	-	-	-	-	129,863.0	1.1	32,465.7	0.3	-	-	-	-	11,652,381.9	9.1
F. Financial instruments	4,736,653.9	29.0	801,550.3	4.9	239,132.0	1.5	-	-	-	-	5,681,040.7	34.7	-	-	0.0	-	4,895,941.2	29.9	16,354,318.1	12.8
Total Investment Costs	10,389,775.7	8.7	8,670,594.8	7.2	9,301,521.4	7.8	15,383,061.1	12.9	16,121,318.6	13.5	17,675,686.2	14.8	12,791,714.1	10.7	8,340,567.7	7.0	20,992,985.1	17.5	119,667,224.7	93.9
II. Recurrent Costs																				
A. Salaries and allowances	3,779,589.0	57.7	1,116,183.8	17.0	669,710.3	10.2	-	-	-	-	-	-	-	-	982,144.1	15.0	-	-	6,547,627.2	5.1
B. Operation and maintenance	808,472.0	66.7	404,236.0	33.3	-	-	-	-	-	-	-	-	-	-	-0.0	-0.0	-	-	1,212,707.9	1.0
Total Recurrent Costs	4,588,060.9	59.1	1,520,419.8	19.6	669,710.3	8.6	-	-	-	-	-	-	-	-	982,144.1	12.7	-	-	7,760,335.1	6.1
Total PROJECT COSTS	14,977,836.7	11.8	10,191,014.6	8.0	9,971,231.7	7.8	15,383,061.1	12.1	16,121,318.6	12.7	17,675,686.2	13.9	12,791,714.1	10.0	9,322,711.7	7.3	20,992,985.1	16.5	127,427,559.8	100.0

Yemen
Rural Grow th Program
Table 1. Component 1. Community empow erment. Al Dhala
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Community Institutional Building																		
Community Facilitators - capacity building	lumpsum	1	-	-	-	-	-	-	1	13,200	13,200.0	-	-	-	-	-	-	13,200.0
Community Facilitators - vehicles /b	unit	5	-	-	-	-	-	-	5	27,000	135,000.0	-	-	-	-	-	-	135,000.0
Community Facilitators - drivers	pers/month	60	60	60	60	-	-	-	240	250	15,000.0	15,000.0	15,000.0	15,000.0	-	-	-	60,000.0
Community Facilitators - equipment	lumpsum	5	-	-	-	-	-	-	5	2,600	13,000.0	-	-	-	-	-	-	13,000.0
Community Facilitators - fees /c	pers month	120	120	120	120	-	-	-	480	1,000	120,000.0	120,000.0	120,000.0	120,000.0	-	-	-	480,000.0
Furniture for CDAs	unit	40	40	-	-	-	-	-	80	100	4,000.0	4,000.0	-	-	-	-	-	8,000.0
Awareness campaign	lumpsum	1	-	-	-	-	-	-	1	15,000	15,000.0	-	-	-	-	-	-	15,000.0
International TA /d	training	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											327,700.0	151,500.0	135,000.0	135,000.0	-	-	-	749,200.0
B. Women empowerment																		
Literacy training course /e	lumpsum										83,000.0	141,000.0	58,000.0	-	-	-	-	282,000.0
Life-skills training /f	lumpsum										-	60,000.0	60,000.0	-	-	-	-	120,000.0
Subtotal											83,000.0	201,000.0	118,000.0	-	-	-	-	402,000.0
C. Livelihoods Improvement																		
1. Women Savings and Credit Groups and Associations																		
SCA capitalization	lumpsum										-	-	20,000.0	30,000.0	30,000.0	-	-	80,000.0
SCG capitalization	lumpsum										40,000.0	128,000.0	232,000.0	-	-	-	-	400,000.0
SCG matching grants	lumpsum										60,000.0	132,000.0	72,000.0	-	-	-	-	264,000.0
SCG refinancing loans	lumpsum										-	-	81,600.0	208,000.0	126,400.0	-	-	416,000.0
SCA and SCG international TA	pers month	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
SCA and SCG national TA	pers month	3	3	1	-	-	-	-	7	3,000	9,000.0	9,000.0	3,000.0	-	-	-	-	21,000.0
Subtotal											121,500.0	281,500.0	408,600.0	238,000.0	156,400.0	-	-	1,206,000.0
2. Income Generating Activities																		
Capacity building of micro-entrepreneu	lumpsum										20,000.0	20,000.0	-	-	-	-	-	40,000.0
Beneficiaries contribution	lumpsum										45,000.0	120,000.0	135,000.0	60,000.0	-	-	-	360,000.0
Matching grants	lumpsum										45,000.0	120,000.0	135,000.0	60,000.0	-	-	-	360,000.0
Refinincing loans	lumpsum										210,000.0	350,000.0	70,000.0	-	-	-	-	630,000.0
Energy grants	lumpsum										-	50,000.0	50,000.0	50,000.0	50,000.0	-	-	200,000.0
Market promotion	lumpsum										-	10,000.0	10,000.0	10,000.0	10,000.0	-	-	40,000.0
Exposure visits	lumpsum										-	20,000.0	20,000.0	-	20,000.0	-	-	60,000.0
Fair participation	lumpsum										-	10,000.0	-	10,000.0	-	10,000.0	-	30,000.0
Value chain analysis	lumpsum	1	2	1	-	-	-	-	4	20,000	20,000.0	40,000.0	20,000.0	-	-	-	-	80,000.0
Subtotal											340,000.0	740,000.0	440,000.0	190,000.0	80,000.0	10,000.0	-	1,800,000.0
Subtotal											461,500.0	1,021,500.0	848,600.0	428,000.0	236,400.0	10,000.0	-	3,006,000.0
Total											872,200.0	1,374,000.0	1,101,600.0	563,000.0	236,400.0	10,000.0	-	4,157,200.0

\a 2-month training for all CFs teams. Training carried out by PMU Gender and Community Development Specialist and Field Managers.
\b Vehicle w ould be given back to the Ministry of Agriculture and Irrigation once the CFs teams w ould be no longer needed
\c Comrpising of fees and travel expenses
\d Part-time for training the CFs teams and part-time for training the Field Managers (during the first year)
\e Service provider contract includes: 2 months to identify w omen in each VU to become teacher; 3 months training of teachers; 2 months/year supervision of training, and payments of teachers. SP monthly rate $ 5 000 (fees, per diem, travel expenses, and overh
\f Service provider contract includes: 1 course per month during one year per VU. Lumpsum for the service provider: $ 5 000/month per batch of 40 VUs

Yemen
Rural Growth Program
Table 2. Component 1. Community empowerment. Dhamar
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Community Institutional Building																		
Community Facilitators - capacity building /a	lumpsum	1	-	-	-	-	-	-	1	13,200	13,200.0	-	-	-	-	-	-	13,200.0
Community Facilitators - vehicles /b	unit	5	-	-	-	-	-	-	5	27,000	135,000.0	-	-	-	-	-	-	135,000.0
Community Facilitators - drivers	pers/month	60	60	60	60	-	-	-	240	250	15,000.0	15,000.0	15,000.0	15,000.0	-	-	-	60,000.0
Community Facilitators - equipment	lumpsum	5	-	-	-	-	-	-	5	2,600	13,000.0	-	-	-	-	-	-	13,000.0
Community Facilitators - fees /c	pers month	120	120	120	120	-	-	-	480	1,000	120,000.0	120,000.0	120,000.0	120,000.0	-	-	-	480,000.0
Furniture for CDAs	unit	40	40	-	-	-	-	-	80	100	4,000.0	4,000.0	-	-	-	-	-	8,000.0
Awareness campaign	lumpsum	1	-	-	-	-	-	-	1	15,000	15,000.0	-	-	-	-	-	-	15,000.0
International TA /d	training	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											327,700.0	151,500.0	135,000.0	135,000.0	-	-	-	749,200.0
B. Women empowerment																		
Literacy training course /e	lumpsum										83,000.0	141,000.0	58,000.0	-	-	-	-	282,000.0
Life-skills training /f	lumpsum										-	60,000.0	60,000.0	-	-	-	-	120,000.0
Subtotal											83,000.0	201,000.0	118,000.0	-	-	-	-	402,000.0
C. Livelihoods Improvement																		
1. Women Savings and Credit Groups and Associations																		
SCA capitalization	lumpsum										-	-	20,000.0	30,000.0	30,000.0	-	-	80,000.0
SCG capitalization	lumpsum										40,000.0	128,000.0	232,000.0	-	-	-	-	400,000.0
SCG matching grants	lumpsum										60,000.0	132,000.0	72,000.0	-	-	-	-	264,000.0
SCG refinancing loans	lumpsum										-	-	81,600.0	208,000.0	126,400.0	-	-	416,000.0
SCA and SCG international TA	pers month	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
SCA and SCG national TA	pers month	3	3	1	-	-	-	-	7	3,000	9,000.0	9,000.0	3,000.0	-	-	-	-	21,000.0
Subtotal											121,500.0	281,500.0	408,600.0	238,000.0	156,400.0	-	-	1,206,000.0
2. Income Generating Activities																		
Capacity building of micro-entrepreneur	lumpsum										20,000.0	20,000.0	20,000.0	20,000.0	-	-	-	80,000.0
Beneficiaries contribution	lumpsum										45,000.0	120,000.0	135,000.0	60,000.0	-	-	-	360,000.0
Matching grants	lumpsum										45,000.0	120,000.0	135,000.0	60,000.0	-	-	-	360,000.0
Refinancing loans	lumpsum										210,000.0	350,000.0	70,000.0	-	-	-	-	630,000.0
Energy grants	lumpsum										-	50,000.0	50,000.0	50,000.0	50,000.0	-	-	200,000.0
Market promotion	lumpsum										-	10,000.0	10,000.0	10,000.0	10,000.0	-	-	40,000.0
Exposure visits	lumpsum										-	20,000.0	20,000.0	-	20,000.0	-	-	60,000.0
Fair participation	lumpsum										-	10,000.0	-	10,000.0	-	10,000.0	-	30,000.0
Value chain analysis	lumpsum	1	2	1	-	-	-	-	4	20,000	20,000.0	40,000.0	20,000.0	-	-	-	-	80,000.0
Subtotal											340,000.0	740,000.0	460,000.0	210,000.0	80,000.0	10,000.0	-	1,840,000.0
Subtotal											461,500.0	1,021,500.0	868,600.0	448,000.0	236,400.0	10,000.0	-	3,046,000.0
Total											872,200.0	1,374,000.0	1,121,600.0	583,000.0	236,400.0	10,000.0	-	4,197,200.0

\a 2-month training for all CFs teams. Training carried out by PMU Gender and Community Development Specialist and Field Managers.
\b Vehicle would be given back to the Ministry of Agriculture and Irrigation once the CFs teams would be no longer needed
\c Comrpising of fees and travel expenses
\d Part-time for training the CFs teams and part-time for training the Field Managers (during the first year)
\e Service provider contract includes: 2 months to identify women in each VU to become teacher; 3 months training of teachers; 2 months/year supervision of training, and payments of teachers. SP monthly rate $ 5 000 (fees, per diem, travel expenses, and overh
\f Service provider contract includes: 1 course per month during one year per VU. Lumpsum for the service provider: $ 5 000/month per batch of 40 VUs

Yemen
Rural Grow th Program
Table 3. Component 1. Community empow erment. Hodeida
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Community Institutional Building																		
Community Facilitators - capacity building	lumpsum	1	1	-	-	-	-	-	2	13,200	13,200.0	13,200.0	-	-	-	-	-	26,400.0
Community Facilitators - vehicles /b	unit	5	3	-	-	-	-	-	8	27,000	135,000.0	81,000.0	-	-	-	-	-	216,000.0
Community Facilitators - drivers	pers/month	60	96	96	96	96	-	-	444	250	15,000.0	24,000.0	24,000.0	24,000.0	24,000.0	-	-	111,000.0
Community Facilitators - equipment	lumpsum	5	3	-	-	-	-	-	8	2,600	13,000.0	7,800.0	-	-	-	-	-	20,800.0
Community Facilitators - fees /c	pers month	120	192	192	192	192	-	-	888	1,000	120,000.0	192,000.0	192,000.0	192,000.0	192,000.0	-	-	888,000.0
Furniture for CDAs	unit	40	50	40	-	-	-	-	130	100	4,000.0	5,000.0	4,000.0	-	-	-	-	13,000.0
Aw areness campaign	lumpsum	1	-	-	-	-	-	-	1	15,000	15,000.0	-	-	-	-	-	-	15,000.0
International TA /d	training	0.5	0.5	0.5	-	-	-	-	1.5	25,000	12,500.0	12,500.0	12,500.0	-	-	-	-	37,500.0
Subtotal											327,700.0	335,500.0	232,500.0	216,000.0	216,000.0	-	-	1,327,700.0
B. Women empowerment																		
Literacy training course /e	lumpsum										83,000.0	153,000.0	153,000.0	58,000.0	-	-	-	447,000.0
Life-skills training /f	lumpsum										60,000.0	60,000.0	60,000.0	-	-	-	-	180,000.0
Subtotal											143,000.0	213,000.0	213,000.0	58,000.0	-	-	-	627,000.0
C. Livelihoods Improvement																		
1. Women Savings and Credit Groups and Associations																		
SCA capitalization	lumpsum										-	-	20,000.0	30,000.0	30,000.0	-	-	80,000.0
SCG capitalization	lumpsum										40,000.0	138,000.0	294,000.0	412,000.0	-	-	-	884,000.0
SCG matching grants	lumpsum										60,000.0	147,000.0	150,000.0	72,000.0	-	-	-	429,000.0
SCG refinancing loans	lumpsum										-	-	81,600.0	228,400.0	239,600.0	126,400.0	-	676,000.0
SCA and SCG international TA	pers month	1	0.5	0.5	-	-	-	-	2	25,000	25,000.0	12,500.0	12,500.0	-	-	-	-	50,000.0
SCA and SCG national TA	pers month	3	3	3	1	-	-	-	10	3,000	9,000.0	9,000.0	9,000.0	3,000.0	-	-	-	30,000.0
Subtotal											134,000.0	306,500.0	567,100.0	745,400.0	269,600.0	126,400.0	-	2,149,000.0
2. Income Generating Activities																		
Capacity building of micro-entrepreneu	lumpsum										20,000.0	20,000.0	20,000.0	20,000.0	-	-	-	80,000.0
Beneficiaries contribution	lumpsum										45,000.0	131,250.0	198,750.0	150,000.0	60,000.0	-	-	585,000.0
Matching grants	lumpsum										45,000.0	131,250.0	198,750.0	150,000.0	60,000.0	-	-	585,000.0
Refinincing loans	lumpsum										210,000.0	402,500.0	315,000.0	52,500.0	-	-	-	980,000.0
Energy grants	lumpsum										-	50,000.0	50,000.0	50,000.0	50,000.0	-	-	200,000.0
Market promotion	lumpsum										-	10,000.0	10,000.0	10,000.0	10,000.0	-	-	40,000.0
Exposure visits	lumpsum										-	20,000.0	20,000.0	-	20,000.0	-	-	60,000.0
Fair participation	lumpsum										-	10,000.0	-	10,000.0	-	10,000.0	-	30,000.0
Value chain analysis	lumpsum	1	2	1	-	-	-	-	4	20,000	20,000.0	40,000.0	20,000.0	-	-	-	-	80,000.0
Subtotal											340,000.0	815,000.0	832,500.0	442,500.0	200,000.0	10,000.0	-	2,640,000.0
Subtotal											474,000.0	1,121,500.0	1,399,600.0	1,187,900.0	469,600.0	136,400.0	-	4,789,000.0
Total											944,700.0	1,670,000.0	1,845,100.0	1,461,900.0	685,600.0	136,400.0	-	6,743,700.0

\a 2-month training for all CFs teams. Training carried out by PMU Gender and Community Development Specialist and Field Managers.
\b Vehicle w ould be given back to the Ministry of Agriculture and Irrigation once the CFs teams w ould be no longer needed
\c Comrpising of fees and travel expenses
\d Part-time for training the CFs teams and part-time for training the Field Managers (during the first year)
\e Service provider contract includes: 2 months to identify w omen in each VU to become teacher; 3 months training of teachers; 2 months/year supervision of training, and payments of teachers. SP monthly rate $ 5 000 (fees, per diem, travel expenses, and overh
\f Service provider contract includes: 1 course per month during one year per VU. Lumpsum for the service provider: $ 5 000/month per batch of 40 VUs

Yemen
Rural Growth Program
Table 4. Component 1. Community empowerment. Lahej
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Community Institutional Building																		
Community Facilitators - capacity buildin	lumpsum	1	1	-	-	-	-	-	2	13,200	13,200.0	13,200.0	-	-	-	-	-	26,400.0
Community Facilitators - vehicles /b	unit	5	3	-	-	-	-	-	8	27,000	135,000.0	81,000.0	-	-	-	-	-	216,000.0
Community Facilitators - drivers	pers/month	60	96	96	96	96	-	-	444	250	15,000.0	24,000.0	24,000.0	24,000.0	24,000.0	-	-	111,000.0
Community Facilitators - equipment	lumpsum	5	3	-	-	-	-	-	8	2,600	13,000.0	7,800.0	-	-	-	-	-	20,800.0
Community Facilitators - fees /c	pers month	120	192	192	192	192	-	-	888	1,000	120,000.0	192,000.0	192,000.0	192,000.0	192,000.0	-	-	888,000.0
Furniture for CDAs	unit	40	50	40	-	-	-	-	130	100	4,000.0	5,000.0	4,000.0	-	-	-	-	13,000.0
Awareness campaign	lumpsum	1	-	-	-	-	-	-	1	15,000	15,000.0	-	-	-	-	-	-	15,000.0
International TA /d	training	0.5	0.5	0.5	-	-	-	-	1.5	25,000	12,500.0	12,500.0	12,500.0	-	-	-	-	37,500.0
Subtotal											327,700.0	335,500.0	232,500.0	216,000.0	216,000.0	-	-	1,327,700.0
B. Women empowerment																		
Literacy training course /e	lumpsum										83,000.0	153,000.0	153,000.0	58,000.0	-	-	-	447,000.0
Life-skills training /f	lumpsum										60,000.0	60,000.0	60,000.0	-	-	-	-	180,000.0
Subtotal											143,000.0	213,000.0	213,000.0	58,000.0	-	-	-	627,000.0
C. Livelihoods Improvement																		
1. Women Savings and Credit Groups and Associations																		
SCA capitalization	lumpsum										-	-	20,000.0	30,000.0	30,000.0	-	-	80,000.0
SCG capitalization	lumpsum										40,000.0	138,000.0	294,000.0	412,000.0	-	-	-	884,000.0
SCG matching grants	lumpsum										60,000.0	147,000.0	150,000.0	72,000.0	-	-	-	429,000.0
SCG refinancing loans	lumpsum										-	-	81,600.0	228,400.0	239,600.0	126,400.0	-	676,000.0
SCA and SCG international TA	pers month	1	0.5	0.5	-	-	-	-	2	25,000	25,000.0	12,500.0	12,500.0	-	-	-	-	50,000.0
SCA and SCG national TA	pers month	3	3	3	1	-	-	-	10	3,000	9,000.0	9,000.0	9,000.0	3,000.0	-	-	-	30,000.0
Subtotal											134,000.0	306,500.0	567,100.0	745,400.0	269,600.0	126,400.0	-	2,149,000.0
2. Income Generating Activities																		
Capacity building of micro-entreprene	lumpsum										20,000.0	20,000.0	20,000.0	20,000.0	-	-	-	80,000.0
Beneficiaries contribution	lumpsum										45,000.0	131,250.0	198,750.0	150,000.0	60,000.0	-	-	585,000.0
Matching grants	lumpsum										45,000.0	131,250.0	198,750.0	150,000.0	60,000.0	-	-	585,000.0
Refinincing loans	lumpsum										210,000.0	402,500.0	315,000.0	52,500.0	-	-	-	980,000.0
Energy grants	lumpsum										-	50,000.0	50,000.0	50,000.0	50,000.0	-	-	200,000.0
Market promotion	lumpsum										-	10,000.0	10,000.0	10,000.0	10,000.0	-	-	40,000.0
Exposure visits	lumpsum										-	20,000.0	20,000.0	-	20,000.0	-	-	60,000.0
Fair participation	lumpsum										-	10,000.0	-	10,000.0	-	10,000.0	-	30,000.0
Value chain analysis	lumpsum	1	2	1	-	-	-	-	4	20,000	20,000.0	40,000.0	20,000.0	-	-	-	-	80,000.0
Subtotal											340,000.0	815,000.0	832,500.0	442,500.0	200,000.0	10,000.0	-	2,640,000.0
Subtotal											474,000.0	1,121,500.0	1,399,600.0	1,187,900.0	469,600.0	136,400.0	-	4,789,000.0
Total											944,700.0	1,670,000.0	1,845,100.0	1,461,900.0	685,600.0	136,400.0	-	6,743,700.0

\a 2-month training for all CFs teams. Training carried out by PMU Gender and Community Development Specialist and Field Managers.
\b Vehicle would be given back to the Ministry of Agriculture and Irrigation once the CFs teams would be no longer needed
\c Comrpising of fees and travel expenses
\d Part-time for training the CFs teams and part-time for training the Field Managers (during the first year)
\e Service provider contract includes: 2 months to identify women in each VU to become teacher; 3 months training of teachers; 2 months/year supervision of training, and payments of teachers. SP monthly rate $ 5 000 (fees, per diem, travel expenses, and overh
\f Service provider contract includes: 1 course per month during one year per VU. Lumpsum for the service provider: $ 5 000/month per batch of 40 VUs

Yemen
Rural Grow th Program
Table 5. Component 1. Community empow erment. Taiz
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Community Institutional Building																		
Community Facilitators - capacity building /a	lumpsum	1	1	-	-	-	-	-	2	13,200	13,200.0	13,200.0	-	-	-	-	-	26,400.0
Community Facilitators - vehicles /b	unit	5	3	-	-	-	-	-	8	27,000	135,000.0	81,000.0	-	-	-	-	-	216,000.0
Community Facilitators - drivers	pers/month	60	96	96	96	96	-	-	444	250	15,000.0	24,000.0	24,000.0	24,000.0	24,000.0	-	-	111,000.0
Community Facilitators - equipment	lumpsum	5	3	-	-	-	-	-	8	2,600	13,000.0	7,800.0	-	-	-	-	-	20,800.0
Community Facilitators - fees /c	pers month	120	192	192	192	192	-	-	888	1,000	120,000.0	192,000.0	192,000.0	192,000.0	192,000.0	-	-	888,000.0
Furniture for CDAs	unit	40	50	40	-	-	-	-	130	100	4,000.0	5,000.0	4,000.0	-	-	-	-	13,000.0
Awareness campaign	lumpsum	1	-	-	-	-	-	-	1	15,000	15,000.0	-	-	-	-	-	-	15,000.0
International TA /d	training	0.5	0.5	0.5	-	-	-	-	1.5	25,000	12,500.0	12,500.0	12,500.0	-	-	-	-	37,500.0
Subtotal											327,700.0	335,500.0	232,500.0	216,000.0	216,000.0	-	-	1,327,700.0
B. Women empowerment																		
Literacy training course /e	lumpsum										83,000.0	141,000.0	58,000.0	-	-	-	-	282,000.0
Life-skills training /f	lumpsum										-	60,000.0	60,000.0	-	-	-	-	120,000.0
Subtotal											83,000.0	201,000.0	118,000.0	-	-	-	-	402,000.0
C. Livelihoods Improvement																		
1. Women Savings and Credit Groups and Associations																		
SCA capitalization	lumpsum										-	-	20,000.0	30,000.0	30,000.0	-	-	80,000.0
SCG capitalization	lumpsum										40,000.0	138,000.0	294,000.0	412,000.0	-	-	-	884,000.0
SCG matching grants	lumpsum										60,000.0	147,000.0	150,000.0	72,000.0	-	-	-	429,000.0
SCG refinancing loans	lumpsum										-	-	81,600.0	228,400.0	239,600.0	-	-	549,600.0
SCA and SCG international TA	pers month	1	0.5	0.5	-	-	-	-	2	25,000	25,000.0	12,500.0	12,500.0	-	-	-	-	50,000.0
SCA and SCG national TA	pers month	3	3	3	1	-	-	-	10	3,000	9,000.0	9,000.0	9,000.0	3,000.0	-	-	-	30,000.0
Subtotal											134,000.0	306,500.0	567,100.0	745,400.0	269,600.0	-	-	2,022,600.0
2. Income Generating Activities																		
Capacity building of micro-entrepreneurs	lumpsum										20,000.0	20,000.0	20,000.0	20,000.0	-	-	-	80,000.0
Beneficiaries contribution	lumpsum										45,000.0	131,250.0	198,750.0	150,000.0	60,000.0	-	-	585,000.0
Matching grants	lumpsum										45,000.0	131,250.0	198,750.0	150,000.0	60,000.0	-	-	585,000.0
Refinincing loans	lumpsum										210,000.0	402,500.0	315,000.0	52,500.0	-	-	-	980,000.0
Energy grants	lumpsum										-	50,000.0	50,000.0	50,000.0	50,000.0	-	-	200,000.0
Market promotion	lumpsum										-	10,000.0	10,000.0	10,000.0	10,000.0	-	-	40,000.0
Exposure visits	lumpsum										-	20,000.0	20,000.0	-	20,000.0	-	-	60,000.0
Fair participation	lumpsum										-	-	10,000.0	-	10,000.0	-	-	20,000.0
Value chain analysis	lumpsum	1	2	1	-	-	-	-	4	20,000	20,000.0	40,000.0	20,000.0	-	-	-	-	80,000.0
Subtotal											340,000.0	805,000.0	842,500.0	432,500.0	210,000.0	-	-	2,630,000.0
Subtotal											474,000.0	1,111,500.0	1,409,600.0	1,177,900.0	479,600.0	-	-	4,652,600.0
Total											884,700.0	1,648,000.0	1,760,100.0	1,393,900.0	695,600.0	-	-	6,382,300.0

\a 2-month training for all CFs teams. Training carried out by PMU Gender and Community Development Specialist and Field Managers.
\b Vehicle w ould be given back to the Ministry of Agriculture and Irrigation once the CFs teams w ould be no longer needed
\c Comrpising of fees and travel expenses
\d Part-time for training the CFs teams and part-time for training the Field Managers (during the first year)
\e Service provider contract includes: 2 months to identify w omen in each VU to become teacher; 3 months training of teachers; 2 months/year supervision of training, and payments of teachers. SP monthly rate $ 5 000 (fees, per diem, travel expenses, and overh
\f Service provider contract includes: 1 course per month during one year per VU. Lumpsum for the service provider: $ 5 000/month per batch of 40 VUs

Yemen
Rural Growth Program
Table 6. Component 2. Natural Resource Management and Resilient Infrastructure. Al Dhala
Detailed Costs
(US$)

		Quantities								Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Drinking water																		
1. Individual roof water harvesting																		
Civil works	VU	5	5	5	-	-	-	-	15	300,000	1,500,000.0	1,500,000.0	1,500,000.0	-	-	-	-	4,500,000.0
2. Boreholes																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil works	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
Subtotal											1,500,000.0	1,500,000.0	1,500,000.0	-	-	-	-	4,500,000.0
B. Soil and water conservation																		
1. Water harvesting structures																		
a. Large structures and conveyance																		
Design	unit	1	1	1	-	-	-	-	3	8,000	8,000.0	8,000.0	8,000.0	-	-	-	-	24,000.0
Civil works	unit	-	1	1	1	-	-	-	3	200,000	-	200,000.0	200,000.0	200,000.0	-	-	-	600,000.0
Supervision	unit	-	1	1	1	-	-	-	3	12,000	-	12,000.0	12,000.0	12,000.0	-	-	-	36,000.0
WUAs capacity building	session	1	2	2	1	-	-	-	6	15,000	15,000.0	30,000.0	30,000.0	15,000.0	-	-	-	90,000.0
Subtotal											23,000.0	250,000.0	250,000.0	227,000.0	-	-	-	750,000.0
b. Small structures and conveyance																		
Design	unit	3	4	4	-	-	-	-	11	4,800	14,400.0	19,200.0	19,200.0	-	-	-	-	52,800.0
Civil works	unit	-	3	4	4	-	-	-	11	120,000	-	360,000.0	480,000.0	480,000.0	-	-	-	1,320,000.0
Supervision	unit	-	3	4	4	-	-	-	11	7,200	-	21,600.0	28,800.0	28,800.0	-	-	-	79,200.0
WUAs capacity building	session	-	1	3	3	1	-	-	8	15,000	-	15,000.0	45,000.0	45,000.0	15,000.0	-	-	120,000.0
Subtotal											14,400.0	415,800.0	573,000.0	553,800.0	15,000.0	-	-	1,572,000.0
c. Spate irrigation																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil works	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
Subtotal											37,400.0	665,800.0	823,000.0	780,800.0	15,000.0	-	-	2,322,000.0
2. Land conservation																		
a. Terrasses rehabilitation	ha	-	30	100	70	-	-	-	200	3,100	-	93,000.0	310,000.0	217,000.0	-	-	-	620,000.0
b. Wadi bank protection																		
Design	ha	10	20	20	-	-	-	-	50	40	400.0	800.0	800.0	-	-	-	-	2,000.0
Civil works	ha	-	10	20	20	-	-	-	50	1,000	-	10,000.0	20,000.0	20,000.0	-	-	-	50,000.0
Supervision	ha	-	10	20	20	-	-	-	50	60	-	600.0	1,200.0	1,200.0	-	-	-	3,000.0
Subtotal											400.0	11,400.0	22,000.0	21,200.0	-	-	-	55,000.0
c. LMAs capacity building	session	1	3	3	1	-	-	-	8	15,000	15,000.0	45,000.0	45,000.0	15,000.0	-	-	-	120,000.0
Subtotal											15,400.0	149,400.0	377,000.0	253,200.0	-	-	-	795,000.0
Subtotal											52,800.0	815,200.0	1,200,000.0	1,034,000.0	15,000.0	-	-	3,117,000.0
C. Rangeland /a																		
1. Investment	units	-	6	6	-	-	-	-	12	16,000	-	96,000.0	96,000.0	-	-	-	-	192,000.0
2. Protected rangelang training	session	1	2	1	-	-	-	-	4	10,000	10,000.0	20,000.0	10,000.0	-	-	-	-	40,000.0
Subtotal											10,000.0	116,000.0	106,000.0	-	-	-	-	232,000.0
D. Roads																		
1. Design	km	10	12	10	-	-	-	-	32	1,600	16,000.0	19,200.0	16,000.0	-	-	-	-	51,200.0
2. Civil works	km	-	10	12	10	-	-	-	32	40,000	-	400,000.0	480,000.0	400,000.0	-	-	-	1,280,000.0
3. Supervision	km	-	10	12	10	-	-	-	32	2,400	-	24,000.0	28,800.0	24,000.0	-	-	-	76,800.0
4. RMGs capacity building	km	1	2	2	1	-	-	-	6	15,000	15,000.0	30,000.0	30,000.0	15,000.0	-	-	-	90,000.0
Subtotal											31,000.0	473,200.0	554,800.0	439,000.0	-	-	-	1,498,000.0
Total											1,593,800.0	2,904,400.0	3,360,800.0	1,473,000.0	15,000.0	-	-	9,347,000.0

\a 2 ha per unit

Yemen
Rural Grow th Program
Table 7. Component 2. Natural Resource Management and Resilient Infrastructure. Dhamar
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Drinking water																		
1. Individual roof water harvesting																		
Civil w orks	VU	5	5	5	-	-	-	-	15	300,000	1,500,000.0	1,500,000.0	1,500,000.0	-	-	-	-	4,500,000.0
2. Boreholes																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil w orks	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
Subtotal											1,500,000.0	1,500,000.0	1,500,000.0	-	-	-	-	4,500,000.0
B. Soil and water conservation																		
1. Water harvesting structures																		
a. Large structures and conveyance																		
Design	unit	1	1	1	-	-	-	-	3	8,000	8,000.0	8,000.0	8,000.0	-	-	-	-	24,000.0
Civil w orks	unit	-	1	1	1	-	-	-	3	200,000	-	200,000.0	200,000.0	200,000.0	-	-	-	600,000.0
Supervision	unit	-	1	1	1	-	-	-	3	12,000	-	12,000.0	12,000.0	12,000.0	-	-	-	36,000.0
WUAs capacity building	session	1	2	2	1	-	-	-	6	15,000	15,000.0	30,000.0	30,000.0	15,000.0	-	-	-	90,000.0
Subtotal											23,000.0	250,000.0	250,000.0	227,000.0	-	-	-	750,000.0
b. Small structures and conveyance																		
Design	unit	3	4	4	-	-	-	-	11	4,800	14,400.0	19,200.0	19,200.0	-	-	-	-	52,800.0
Civil w orks	unit	-	3	4	4	-	-	-	11	120,000	-	360,000.0	480,000.0	480,000.0	-	-	-	1,320,000.0
Supervision	unit	-	3	4	4	-	-	-	11	7,200	-	21,600.0	28,800.0	28,800.0	-	-	-	79,200.0
WUAs capacity building	session	-	1	3	3	1	-	-	8	15,000	-	15,000.0	45,000.0	45,000.0	15,000.0	-	-	120,000.0
Subtotal											14,400.0	415,800.0	573,000.0	553,800.0	15,000.0	-	-	1,572,000.0
c. Spate irrigation																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil w orks	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
Subtotal											37,400.0	665,800.0	823,000.0	780,800.0	15,000.0	-	-	2,322,000.0
2. Land conservation																		
a. Terrasses rehabilitation	ha	-	30	100	170	-	-	-	300	3,100	-	93,000.0	310,000.0	527,000.0	-	-	-	930,000.0
b. Wadi bank protection																		
Design	ha	10	20	20	-	-	-	-	50	40	400.0	800.0	800.0	-	-	-	-	2,000.0
Civil w orks	ha	-	10	20	20	-	-	-	50	1,000	-	10,000.0	20,000.0	20,000.0	-	-	-	50,000.0
Supervision	ha	-	10	20	20	-	-	-	50	60	-	600.0	1,200.0	1,200.0	-	-	-	3,000.0
Subtotal											400.0	11,400.0	22,000.0	21,200.0	-	-	-	55,000.0
c. LMAs capacity building	session	1	2	2	1	-	-	-	6	15,000	15,000.0	30,000.0	30,000.0	15,000.0	-	-	-	90,000.0
Subtotal											15,400.0	134,400.0	362,000.0	563,200.0	-	-	-	1,075,000.0
Subtotal											52,800.0	800,200.0	1,185,000.0	1,344,000.0	15,000.0	-	-	3,397,000.0
C. Rangeland /a																		
1. Investment	units	-	7	7	-	-	-	-	14	16,000	-	112,000.0	112,000.0	-	-	-	-	224,000.0
2. Protected rangelang training	session	1	2	1	-	-	-	-	4	10,000	10,000.0	20,000.0	10,000.0	-	-	-	-	40,000.0
Subtotal											10,000.0	132,000.0	122,000.0	-	-	-	-	264,000.0
D. Roads																		
1. Design	km	10	12	10	-	-	-	-	32	1,600	16,000.0	19,200.0	16,000.0	-	-	-	-	51,200.0
2. Civil w orks	km	-	10	12	10	-	-	-	32	40,000	-	400,000.0	480,000.0	400,000.0	-	-	-	1,280,000.0
3. Supervision	km	-	10	12	10	-	-	-	32	2,400	-	24,000.0	28,800.0	24,000.0	-	-	-	76,800.0
4. RMGs capacity building	km	1	2	2	1	-	-	-	6	15,000	15,000.0	30,000.0	30,000.0	15,000.0	-	-	-	90,000.0
Subtotal											31,000.0	473,200.0	554,800.0	439,000.0	-	-	-	1,498,000.0
Total											1,593,800.0	2,905,400.0	3,361,800.0	1,783,000.0	15,000.0	-	-	9,659,000.0

\a 2 ha per unit

Yemen
Rural Growth Program
Table 8. Component 2. Natural Resource Management and Resilient Infrastructure. Hodeida
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Drinking water																		
1. Individual roof water harvesting																		
Civil works	VU	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
2. Boreholes																		
Design	unit	10	16	11	-	-	-	-	37	2,400	24,000.0	38,400.0	26,400.0	-	-	-	-	88,800.0
Civil works	unit	-	10	16	11	-	-	-	37	63,000	-	630,000.0	1,008,000.0	693,000.0	-	-	-	2,331,000.0
Supervision	unit	-	10	16	11	-	-	-	37	4,200	-	42,000.0	67,200.0	46,200.0	-	-	-	155,400.0
WUAs capacity building	session	4	6	6	3	-	-	-	19	15,000	60,000.0	90,000.0	90,000.0	45,000.0	-	-	-	285,000.0
Subtotal											84,000.0	800,400.0	1,191,600.0	784,200.0	-	-	-	2,860,200.0
Subtotal											84,000.0	800,400.0	1,191,600.0	784,200.0	-	-	-	2,860,200.0
B. Soil and water conservation																		
1. Water harvesting structures																		
a. Large structures and conveyance																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil works	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
b. Small structures and conveyance																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil works	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
c. Spate irrigation																		
Design	unit	4	7	7	2	-	-	-	20	3,200	12,800.0	22,400.0	22,400.0	6,400.0	-	-	-	64,000.0
Civil works	unit	-	4	7	7	2	-	-	20	80,000	-	320,000.0	560,000.0	560,000.0	160,000.0	-	-	1,600,000.0
Supervision	unit	-	4	7	7	2	-	-	20	4,800	-	19,200.0	33,600.0	33,600.0	9,600.0	-	-	96,000.0
WUAs capacity building	session	2	3	3	1	-	-	-	9	15,000	30,000.0	45,000.0	45,000.0	15,000.0	-	-	-	135,000.0
Subtotal											42,800.0	406,600.0	661,000.0	615,000.0	169,600.0	-	-	1,895,000.0
Subtotal											42,800.0	406,600.0	661,000.0	615,000.0	169,600.0	-	-	1,895,000.0
2. Land conservation																		
a. Terrasses rehabilitation	ha	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
b. Wadi bank protection																		
Design	ha	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil works	ha	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	ha	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
c. LMAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
Subtotal											42,800.0	406,600.0	661,000.0	615,000.0	169,600.0	-	-	1,895,000.0
C. Rangeland /a																		
1. Investment	units	-	4	4	-	-	-	-	8	16,000	-	64,000.0	64,000.0	-	-	-	-	128,000.0
2. Protected rangelang training	session	1	2	1	-	-	-	-	4	10,000	10,000.0	20,000.0	10,000.0	-	-	-	-	40,000.0
Subtotal											10,000.0	84,000.0	74,000.0	-	-	-	-	168,000.0
D. Roads																		
1. Design	km	12	21	21	12	-	-	-	66	1,600	19,200.0	33,600.0	33,600.0	19,200.0	-	-	-	105,600.0
2. Civil works	km	-	12	21	21	12	-	-	66	40,000	-	480,000.0	840,000.0	840,000.0	480,000.0	-	-	2,640,000.0
3. Supervision	km	-	12	21	21	12	-	-	66	2,400	-	28,800.0	50,400.0	50,400.0	28,800.0	-	-	158,400.0
4. RMGs capacity building	km	-	1	2	2	2	1	-	8	15,000	-	15,000.0	30,000.0	30,000.0	30,000.0	15,000.0	-	120,000.0
Subtotal											19,200.0	557,400.0	954,000.0	939,600.0	538,800.0	15,000.0	-	3,024,000.0
Total											156,000.0	1,848,400.0	2,880,600.0	2,338,800.0	708,400.0	15,000.0	-	7,947,200.0

\a 2 ha per unit

Yemen
Rural Grow th Program
Table 9. Component 2. Natural Resource Management and Resilient Infrastructure. Lahej
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Drinking water																		
1. Individual roof water harvesting																		
Civil w orks	VU	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
2. Boreholes																		
Design	unit	10	17	11	-	-	-	-	38	2,400	24,000.0	40,800.0	26,400.0	-	-	-	-	91,200.0
Civil w orks	unit	-	10	17	11	-	-	-	38	63,000	-	630,000.0	1,071,000.0	693,000.0	-	-	-	2,394,000.0
Supervision	unit	-	10	17	11	-	-	-	38	4,200	-	42,000.0	71,400.0	46,200.0	-	-	-	159,600.0
WUAs capacity building	session	4	6	6	3	-	-	-	19	15,000	60,000.0	90,000.0	90,000.0	45,000.0	-	-	-	285,000.0
Subtotal											84,000.0	802,800.0	1,258,800.0	784,200.0	-	-	-	2,929,800.0
Subtotal											84,000.0	802,800.0	1,258,800.0	784,200.0	-	-	-	2,929,800.0
B. Soil and water conservation																		
1. Water harvesting structures																		
a. Large structures and conveyance																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil w orks	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
b. Small structures and conveyance																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil w orks	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
c. Spate irrigation																		
Design	unit	3	5	5	2	-	-	-	15	3,200	9,600.0	16,000.0	16,000.0	6,400.0	-	-	-	48,000.0
Civil w orks	unit	-	3	5	5	2	-	-	15	80,000	-	240,000.0	400,000.0	400,000.0	160,000.0	-	-	1,200,000.0
Supervision	unit	-	3	5	5	2	-	-	15	4,800	-	14,400.0	24,000.0	24,000.0	9,600.0	-	-	72,000.0
WUAs capacity building	session	2	3	3	1	-	-	-	9	15,000	30,000.0	45,000.0	45,000.0	15,000.0	-	-	-	135,000.0
Subtotal											39,600.0	315,400.0	485,000.0	445,400.0	169,600.0	-	-	1,455,000.0
Subtotal											39,600.0	315,400.0	485,000.0	445,400.0	169,600.0	-	-	1,455,000.0
2. Land conservation																		
a. Terrasses rehabilitation	ha	-	50	100	125	50	-	-	325	3,100	-	155,000.0	310,000.0	387,500.0	155,000.0	-	-	1,007,500.0
b. Wadi bank protection																		
Design	ha	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil w orks	ha	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	ha	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
c. LMAs capacity building	session	1	3	3	1	-	-	-	8	15,000	15,000.0	45,000.0	45,000.0	15,000.0	-	-	-	120,000.0
Subtotal											15,000.0	200,000.0	355,000.0	402,500.0	155,000.0	-	-	1,127,500.0
Subtotal											54,600.0	515,400.0	840,000.0	847,900.0	324,600.0	-	-	2,582,500.0
C. Rangeland /a																		
1. Investment	lumpsum	-	6	6	-	-	-	-	12	16,000	-	96,000.0	96,000.0	-	-	-	-	192,000.0
2. Protected rangelang training	session	1	2	1	-	-	-	-	4	10,000	10,000.0	20,000.0	10,000.0	-	-	-	-	40,000.0
Subtotal											10,000.0	116,000.0	106,000.0	-	-	-	-	232,000.0
D. Roads																		
1. Design	km	12	21	21	12	-	-	-	66	1,600	19,200.0	33,600.0	33,600.0	19,200.0	-	-	-	105,600.0
2. Civil w orks	km	-	12	21	21	12	-	-	66	40,000	-	480,000.0	840,000.0	840,000.0	480,000.0	-	-	2,640,000.0
3. Supervision	km	-	12	21	21	12	-	-	66	2,400	-	28,800.0	50,400.0	50,400.0	28,800.0	-	-	158,400.0
4. RMGs capacity building	km	-	1	2	2	2	1	-	8	15,000	-	15,000.0	30,000.0	30,000.0	30,000.0	15,000.0	-	120,000.0
Subtotal											19,200.0	557,400.0	954,000.0	939,600.0	538,800.0	15,000.0	-	3,024,000.0
Total											167,800.0	1,991,600.0	3,158,800.0	2,571,700.0	863,400.0	15,000.0	-	8,768,300.0

\a 2 ha per unit

Yemen
Rural Grow th Program
Table 10. Component 2. Natural Resource Management and Resilient Infrastructure. Taiz
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Drinking water																		
1. Individual roof water harvesting																		
Civil w orks	VU	5	5	5	-	-	-	-	15	300,000	1,500,000.0	1,500,000.0	1,500,000.0	-	-	-	-	4,500,000.0
2. Boreholes																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil w orks	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
Subtotal											1,500,000.0	1,500,000.0	1,500,000.0	-	-	-	-	4,500,000.0
B. Soil and water conservation																		
1. Water harvesting structures																		
a. Large structures and conveyance																		
Design	unit	1	1	-	-	-	-	-	2	8,000	8,000.0	8,000.0	-	-	-	-	-	16,000.0
Civil w orks	unit	-	1	1	1	-	-	-	3	200,000	-	200,000.0	200,000.0	200,000.0	-	-	-	600,000.0
Supervision	unit	-	1	1	1	-	-	-	3	12,000	-	12,000.0	12,000.0	12,000.0	-	-	-	36,000.0
WUAs capacity building	session	1	2	2	1	-	-	-	6	15,000	15,000.0	30,000.0	30,000.0	15,000.0	-	-	-	90,000.0
Subtotal											23,000.0	250,000.0	242,000.0	227,000.0	-	-	-	742,000.0
b. Small structures and conveyance																		
Design	unit	3	4	4	-	-	-	-	11	4,800	14,400.0	19,200.0	19,200.0	-	-	-	-	52,800.0
Civil w orks	unit	-	3	4	4	-	-	-	11	120,000	-	360,000.0	480,000.0	480,000.0	-	-	-	1,320,000.0
Supervision	unit	-	3	4	4	-	-	-	11	7,200	-	21,600.0	28,800.0	28,800.0	-	-	-	79,200.0
WUAs capacity building	session	1	3	3	1	-	-	-	8	15,000	15,000.0	45,000.0	45,000.0	15,000.0	-	-	-	120,000.0
Subtotal											29,400.0	445,800.0	573,000.0	523,800.0	-	-	-	1,572,000.0
c. Spate irrigation																		
Design	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Civil w orks	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Supervision	unit	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
WUAs capacity building	session	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Subtotal											-	-	-	-	-	-	-	-
Subtotal											52,400.0	695,800.0	815,000.0	750,800.0	-	-	-	2,314,000.0
2. Land conservation																		
a. Terrasses rehabilitation	ha	-	50	100	125	50	-	-	325	3,100	-	155,000.0	310,000.0	387,500.0	155,000.0	-	-	1,007,500.0
b. Wadi bank protection																		
Design	ha	-	10	30	30	-	-	-	70	40	-	400.0	1,200.0	1,200.0	-	-	-	2,800.0
Civil w orks	ha	-	-	10	30	30	-	-	70	1,000	-	-	10,000.0	30,000.0	30,000.0	-	-	70,000.0
Supervision	ha	-	-	10	30	30	-	-	70	60	-	-	600.0	1,800.0	1,800.0	-	-	4,200.0
Subtotal											-	400.0	11,800.0	33,000.0	31,800.0	-	-	77,000.0
c. LMAs capacity building	session	1	3	3	1	-	-	-	8	15,000	15,000.0	45,000.0	45,000.0	15,000.0	-	-	-	120,000.0
Subtotal											15,000.0	200,400.0	366,800.0	435,500.0	186,800.0	-	-	1,204,500.0
Subtotal											67,400.0	896,200.0	1,181,800.0	1,186,300.0	186,800.0	-	-	3,518,500.0
C. Rangeland /a																		
1. Investment	lumpsum	-	7	7	-	-	-	-	14	16,000	-	112,000.0	112,000.0	-	-	-	-	224,000.0
2. Protected rangelang training	session	1	2	1	-	-	-	-	4	10,000	10,000.0	20,000.0	10,000.0	-	-	-	-	40,000.0
Subtotal											10,000.0	132,000.0	122,000.0	-	-	-	-	264,000.0
D. Roads																		
1. Design	km	9	12	12	9	-	-	-	42	1,600	14,400.0	19,200.0	19,200.0	14,400.0	-	-	-	67,200.0
2. Civil w orks	km	-	9	12	12	9	-	-	42	40,000	-	360,000.0	480,000.0	480,000.0	360,000.0	-	-	1,680,000.0
3. Supervision	km	-	9	12	12	9	-	-	42	2,400	-	21,600.0	28,800.0	28,800.0	21,600.0	-	-	100,800.0
4. RMGs capacity building	km	1	2	2	2	1	-	-	8	15,000	15,000.0	30,000.0	30,000.0	30,000.0	15,000.0	-	-	120,000.0
Subtotal											29,400.0	430,800.0	558,000.0	553,200.0	396,600.0	-	-	1,968,000.0
Total											1,606,800.0	2,959,000.0	3,361,800.0	1,739,500.0	583,400.0	-	-	10,250,500.0

\a 2 ha per unit

Yemen
Rural Grow th Program
Table 11. Component 3. Agricultural development. Al Dhala
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Extension support and inputs provision																		
1. Village agriculture technicians (VAT)																		
a. Capacity building	session	20	30	10	-	-	-	-	60	2,000	40,000.0	60,000.0	20,000.0	-	-	-	-	120,000.0
b. Operation costs allocation for one year	lumpsum										72,000.0	108,000.0	36,000.0	-	-	-	-	216,000.0
c. Veterinary kits	kit	40	40	-	-	-	-	-	80	1,500	60,000.0	60,000.0	-	-	-	-	-	120,000.0
Subtotal											172,000.0	228,000.0	56,000.0	-	-	-	-	456,000.0
2. VAT owned input supply stores																		
a. Investment	store	-	20	40	20	-	-	-	80	2,000	-	40,000.0	80,000.0	40,000.0	-	-	-	160,000.0
b. Seed supply for crop diversification (rainfeed f	lumpsum	-	22.5	22.5	22.5	-	-	-	67.5	44	-	990.0	990.0	990.0	-	-	-	2,970.0
c. Working capital	lumpsum										-	60,000.0	120,000.0	60,000.0	-	-	-	240,000.0
d. Financial management training	lumpsum										-	10,000.0	10,000.0	10,000.0	-	-	-	30,000.0
Subtotal											-	110,990.0	210,990.0	110,990.0	-	-	-	432,970.0
Subtotal											172,000.0	338,990.0	266,990.0	110,990.0	-	-	-	888,970.0
B. Irrigation efficiency																		
1. Modern irrigation related to w ater harvesting struc	ha	35	45	35	-	-	-	-	115	3,000	105,000.0	135,000.0	105,000.0	-	-	-	-	345,000.0
2. MOdern irrigation related to existing w ater harves	ha	100	-	-	-	-	-	-	100	3,000	300,000.0	-	-	-	-	-	-	300,000.0
3. GR drip irrigation, mulching and mesh protection	ha	-	60	60	60	-	-	-	180	4,700	-	282,000.0	282,000.0	282,000.0	-	-	-	846,000.0
Subtotal											405,000.0	417,000.0	387,000.0	282,000.0	-	-	-	1,491,000.0
C. Crop diversification																		
1. Green houses	units	250	250	-	-	-	-	-	500	5,000	1,250,000.0	1,250,000.0	-	-	-	-	-	2,500,000.0
2. Demonstration of crops/seed climate change resili	lumpsum										-	62,500.0	62,500.0	62,500.0	62,500.0	-	-	250,000.0
Subtotal											1,250,000.0	1,312,500.0	62,500.0	62,500.0	62,500.0	-	-	2,750,000.0
D. Research and development																		
1. Green house unit for research station /a	unit	1	-	-	-	-	-	-	1	18,000	18,000.0	-	-	-	-	-	-	18,000.0
2. Support to AREA on alternative and potential crop research																		
Post-harvest operation research	trial	1	1	-	-	-	-	-	2	15,000	15,000.0	15,000.0	-	-	-	-	-	30,000.0
Development of alternative crops in qat areas	trial	1	1	-	-	-	-	-	2	25,000	25,000.0	25,000.0	-	-	-	-	-	50,000.0
Genetic improvement of drough and heat -tolerant	trial	-	1	1	-	-	-	-	2	60,000	-	60,000.0	60,000.0	-	-	-	-	120,000.0
Improvement of management efficiency and utilisa	trial	-	-	1	1	-	-	-	2	30,000	-	-	30,000.0	30,000.0	-	-	-	60,000.0
Subtotal											40,000.0	100,000.0	90,000.0	30,000.0	-	-	-	260,000.0
Subtotal											58,000.0	100,000.0	90,000.0	30,000.0	-	-	-	278,000.0
Total											1,885,000.0	2,168,490.0	806,490.0	485,490.0	62,500.0	-	-	5,407,970.0

\a 41x9m, including structure, drip irrigation, solar cell w ith accessories, electric pump, storage 30m3

Yemen
Rural Grow th Program
Table 12. Component 3. Agricultural development. Dhamar
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Extension support and inputs provision																		
1. Village agriculture technicians (VAT)																		
a. Capacity building	session	20	30	10	-	-	-	-	60	2,000	40,000.0	60,000.0	20,000.0	-	-	-	-	120,000.0
b. Operation costs allocation for one year	lumpsum										72,000.0	108,000.0	36,000.0	-	-	-	-	216,000.0
c. Veterinary kits	kit	40	40	-	-	-	-	-	80	1,500	60,000.0	60,000.0	-	-	-	-	-	120,000.0
Subtotal											172,000.0	228,000.0	56,000.0	-	-	-	-	456,000.0
2. VAT owned input supply stores																		
a. Investment	store	-	20	40	20	-	-	-	80	2,000	-	40,000.0	80,000.0	40,000.0	-	-	-	160,000.0
b. Working capital	lumpsum										-	60,000.0	120,000.0	60,000.0	-	-	-	240,000.0
c. Financial management training	lumpsum										-	10,000.0	10,000.0	10,000.0	-	-	-	30,000.0
Subtotal											-	110,000.0	210,000.0	110,000.0	-	-	-	430,000.0
Subtotal											172,000.0	338,000.0	266,000.0	110,000.0	-	-	-	886,000.0
B. Irrigation efficiency																		
1. Modern irrigation related to w ater harvesting structu	ha	35	45	35	-	-	-	-	115	3,000	105,000.0	135,000.0	105,000.0	-	-	-	-	345,000.0
2. Modern irrigation related to existing w ater harvestin	ha	80	-	-	-	-	-	-	80	3,000	240,000.0	-	-	-	-	-	-	240,000.0
3. GR drip irrigation	ha	-	83	83	83	-	-	-	249	3,500	-	290,500.0	290,500.0	290,500.0	-	-	-	871,500.0
4. GR drip irrigation, mulching and mesh protection	ha	-	83	83	83	-	-	-	249	4,700	-	390,100.0	390,100.0	390,100.0	-	-	-	1,170,300.0
Subtotal											345,000.0	815,600.0	785,600.0	680,600.0	-	-	-	2,626,800.0
C. Crop diversification																		
1. Green houses	units	200	200	-	-	-	-	-	400	5,000	1,000,000.0	1,000,000.0	-	-	-	-	-	2,000,000.0
2. Demonstration of crops/seeds climate change resili	lumpsum										-	62,500.0	62,500.0	62,500.0	62,500.0	-	-	250,000.0
Subtotal											1,000,000.0	1,062,500.0	62,500.0	62,500.0	62,500.0	-	-	2,250,000.0
D. Research and development																		
1. Green house unit for research station /a	unit	1	-	-	-	-	-	-	1	18,000	18,000.0	-	-	-	-	-	-	18,000.0
2. Support to AREA on alternative and potential crop research																		
Post-harvest operation research	trial	1	1	-	-	-	-	-	2	15,000	15,000.0	15,000.0	-	-	-	-	-	30,000.0
Development of alternative crops in qat areas	trial	1	1	-	-	-	-	-	2	25,000	25,000.0	25,000.0	-	-	-	-	-	50,000.0
Development of non-conventional w ater resources	trial	-	1	1	-	-	-	-	2	50,000	-	50,000.0	50,000.0	-	-	-	-	100,000.0
Genetic improvement of drough and heat -tolerant v	trial	-	-	1	1	-	-	-	2	60,000	-	-	60,000.0	60,000.0	-	-	-	120,000.0
Improvement of management efficiency and utilisatic	trial	-	-	1	1	-	-	-	2	30,000	-	-	30,000.0	30,000.0	-	-	-	60,000.0
Subtotal											40,000.0	90,000.0	140,000.0	90,000.0	-	-	-	360,000.0
Subtotal											58,000.0	90,000.0	140,000.0	90,000.0	-	-	-	378,000.0
Total											1,575,000.0	2,306,100.0	1,254,100.0	943,100.0	62,500.0	-	-	6,140,800.0

\a 41x9m, including structure, drip irrigation, solar cell w ith accessories, electric pump, storage 30m3

Yemen
Rural Grow th Program
Table 13. Component 3. Agricultural development. Hodeida
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Extension support and inputs provision																		
1. Village agriculture technicians (VAT)																		
a. Capacity building	session	15	37.5	35	10	-	-	-	97.5	2,000	30,000.0	75,000.0	70,000.0	20,000.0	-	-	-	195,000.0
b. Operation costs allocation for one year	lumpsum										54,000.0	135,000.0	126,000.0	36,000.0	-	-	-	351,000.0
c. Veterinary kits	kit	-	30	60	40	-	-	-	130	1,500	-	45,000.0	90,000.0	60,000.0	-	-	-	195,000.0
Subtotal											84,000.0	255,000.0	286,000.0	116,000.0	-	-	-	741,000.0
2. VAT owned input supply stores																		
a. Investment	store	-	30	60	40	-	-	-	130	2,000	-	60,000.0	120,000.0	80,000.0	-	-	-	260,000.0
b. Seed supply for crop diversification (irrigated fodd	lumpsum	-	42	42	42	-	-	-	126	44	-	1,848.0	1,848.0	1,848.0	-	-	-	5,544.0
c. Working capital	lumpsum										-	60,000.0	120,000.0	60,000.0	-	-	-	240,000.0
d. Financial management training	lumpsum										-	10,000.0	10,000.0	10,000.0	-	-	-	30,000.0
Subtotal											-	131,848.0	251,848.0	151,848.0	-	-	-	535,544.0
Subtotal											84,000.0	386,848.0	537,848.0	267,848.0	-	-	-	1,276,544.0
B. Irrigation efficiency																		
1. Bubbler irrigation	ha	-	93	93	93	-	-	-	279	4,400	-	409,200.0	409,200.0	409,200.0	-	-	-	1,227,600.0
2. GR drip irrigation, mulching and mesh protection	ha	-	108	108	108	-	-	-	324	4,700	-	507,600.0	507,600.0	507,600.0	-	-	-	1,522,800.0
Subtotal											-	916,800.0	916,800.0	916,800.0	-	-	-	2,750,400.0
C. Crop diversification																		
1. Green houses	units	150	300	200	-	-	-	-	650	5,000	750,000.0	1,500,000.0	1,000,000.0	-	-	-	-	3,250,000.0
2. Demonstration of crops/seeds climate change resilie	lumpsum										-	62,500.0	62,500.0	62,500.0	62,500.0	-	-	250,000.0
Subtotal											750,000.0	1,562,500.0	1,062,500.0	62,500.0	62,500.0	-	-	3,500,000.0
D. Research and development																		
1. Green house unit for research station /a	unit	-	1	-	-	-	-	-	1	18,000	-	18,000.0	-	-	-	-	-	18,000.0
2. Support to AREA on alternative and potential crop research																		
Post-harvest operation research	trial	1	1	-	-	-	-	-	2	15,000	15,000.0	15,000.0	-	-	-	-	-	30,000.0
Development of alternative crops in qat areas	trial	1	1	-	-	-	-	-	2	25,000	25,000.0	25,000.0	-	-	-	-	-	50,000.0
Development of non-conventional w ater resources f	trial	-	1	1	-	-	-	-	2	50,000	-	50,000.0	50,000.0	-	-	-	-	100,000.0
Genetic improvement of drough and heat -tolerant va	trial	-	-	1	1	-	-	-	2	60,000	-	-	60,000.0	60,000.0	-	-	-	120,000.0
Improvement of management efficiency and utilisatior	trial	-	-	1	1	-	-	-	2	30,000	-	-	30,000.0	30,000.0	-	-	-	60,000.0
Development of date palm under saline and re-used v	trial	-	-	-	1	1	-	-	2	50,000	-	-	-	50,000.0	50,000.0	-	-	100,000.0
Multiplication of doum and coconut	trial	-	-	-	1	1	-	-	2	50,000	-	-	-	50,000.0	50,000.0	-	-	100,000.0
Subtotal											40,000.0	90,000.0	140,000.0	190,000.0	100,000.0	-	-	560,000.0
Subtotal											40,000.0	108,000.0	140,000.0	190,000.0	100,000.0	-	-	578,000.0
Total											874,000.0	2,974,148.0	2,657,148.0	1,437,148.0	162,500.0	-	-	8,104,944.0

\a 41x9m, including structure, drip irrigation, solar cell w ith accessories, electric pump, storage 30m3

Yemen
Rural Grow th Program
Table 14. Component 3. Agricultural development. Lahej
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Extension support and inputs provision																		
1. Village agriculture technicians (VAT)																		
a. Capacity building	session	15	37.5	35	10	-	-	-	97.5	2,000	30,000.0	75,000.0	70,000.0	20,000.0	-	-	-	195,000.0
b. Operation costs allocation for one year	lumpsum										54,000.0	135,000.0	126,000.0	36,000.0	-	-	-	351,000.0
c. Veterinary kits	kit	-	30	60	40	-	-	-	130	1,500	-	45,000.0	90,000.0	60,000.0	-	-	-	195,000.0
Subtotal											84,000.0	255,000.0	286,000.0	116,000.0	-	-	-	741,000.0
2. VAT owned input supply stores																		
a. Investment	store	-	30	60	40	-	-	-	130	2,000	-	60,000.0	120,000.0	80,000.0	-	-	-	260,000.0
b. Seed supply for crop diversification																		
Irrigated crops	lumpsum	-	53	53	53	-	-	-	159	44	-	2,332.0	2,332.0	2,332.0	-	-	-	6,996.0
Rainfed crops	lumpsum	-	18	18	18	-	-	-	54	44	-	792.0	792.0	792.0	-	-	-	2,376.0
Subtotal											-	3,124.0	3,124.0	3,124.0	-	-	-	9,372.0
c. Working capital	lumpsum										-	60,000.0	120,000.0	60,000.0	-	-	-	240,000.0
d. Financial management training	lumpsum										-	10,000.0	10,000.0	10,000.0	-	-	-	30,000.0
Subtotal											-	133,124.0	253,124.0	153,124.0	-	-	-	539,372.0
Subtotal											84,000.0	388,124.0	539,124.0	269,124.0	-	-	-	1,280,372.0
B. Irrigation efficiency																		
1. GR drip irrigation	ha	-	133	133	133	-	-	-	399	3,500	-	465,500.0	465,500.0	465,500.0	-	-	-	1,396,500.0
2. GR drip irrigation, mulching and mesh protection	ha	-	62	62	62	-	-	-	186	4,700	-	291,400.0	291,400.0	291,400.0	-	-	-	874,200.0
Subtotal											-	756,900.0	756,900.0	756,900.0	-	-	-	2,270,700.0
C. Crop diversification																		
1. Green houses	units	150	300	200	-	-	-	-	650	5,000	750,000.0	1,500,000.0	1,000,000.0	-	-	-	-	3,250,000.0
2. Demonstration of crops/seeds climate change resilie	lumpsum										-	62,500.0	62,500.0	62,500.0	62,500.0	-	-	250,000.0
Subtotal											750,000.0	1,562,500.0	1,062,500.0	62,500.0	62,500.0	-	-	3,500,000.0
D. Research and development																		
1. Green house unit for research station /a	unit	-	1	-	-	-	-	-	1	18,000	-	18,000.0	-	-	-	-	-	18,000.0
2. Support to AREA on alternative and potential crop research																		
Post-harvest operation research	trial	-	1	1	-	-	-	-	2	15,000	-	15,000.0	15,000.0	-	-	-	-	30,000.0
Development of alternative crops in qat areas	trial	1	1	-	-	-	-	-	2	25,000	25,000.0	25,000.0	-	-	-	-	-	50,000.0
Improvement of management efficiency and utilisatior	trial	1	1	-	-	-	-	-	2	30,000	30,000.0	30,000.0	-	-	-	-	-	60,000.0
Development of non-conventional w ater resources f	trial	-	1	1	-	-	-	-	2	50,000	-	50,000.0	50,000.0	-	-	-	-	100,000.0
Genetic improvement of drough and heat -tolerant va	trial	-	-	1	1	-	-	-	2	60,000	-	-	60,000.0	60,000.0	-	-	-	120,000.0
Multiplication of doum and coconut	trial	-	-	1	1	-	-	-	2	50,000	-	-	50,000.0	50,000.0	-	-	-	100,000.0
Subtotal											55,000.0	120,000.0	175,000.0	110,000.0	-	-	-	460,000.0
Subtotal											55,000.0	138,000.0	175,000.0	110,000.0	-	-	-	478,000.0
Total											889,000.0	2,845,524.0	2,533,524.0	1,198,524.0	62,500.0	-	-	7,529,072.0

\a 41x9m, including structure, drip irrigation, solar cell w ith accessories, electric pump, storage 30m3

Yemen
Rural Grow th Program
Table 15. Component 3. Agricultural development. Taiz
Detailed Costs
(US$)

		Quantities								Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Extension support and inputs provision																		
1. Village agriculture technicians (VAT)																		
a. Capacity building	session	15	37.5	35	10	-	-	-	97.5	2,000	30,000.0	75,000.0	70,000.0	20,000.0	-	-	-	195,000.0
b. Operation costs allocation for one year	lumpsum										54,000.0	135,000.0	126,000.0	36,000.0	-	-	-	351,000.0
c. Veterinary kits	kit	-	30	60	40	-	-	-	130	1,500	-	45,000.0	90,000.0	60,000.0	-	-	-	195,000.0
Subtotal											84,000.0	255,000.0	286,000.0	116,000.0	-	-	-	741,000.0
2. VAT owned input supply stores																		
a. Investment	store	-	30	60	40	-	-	-	130	2,000	-	60,000.0	120,000.0	80,000.0	-	-	-	260,000.0
b. Seed supply for crop diversification (rainfed fodc	lumpsum	-	32	32	32	-	-	-	96	44	-	1,408.0	1,408.0	1,408.0	-	-	-	4,224.0
c. Working capital	lumpsum										-	60,000.0	120,000.0	60,000.0	-	-	-	240,000.0
d. Financial management training	lumpsum										-	10,000.0	10,000.0	10,000.0	-	-	-	30,000.0
Subtotal											-	131,408.0	251,408.0	151,408.0	-	-	-	534,224.0
Subtotal											84,000.0	386,408.0	537,408.0	267,408.0	-	-	-	1,275,224.0
B. Irrigation efficiency																		
1. Modern irrigation related to w ater harvesting structu	ha	35	45	35	-	-	-	-	115	3,000	105,000.0	135,000.0	105,000.0	-	-	-	-	345,000.0
2. Modern irrigation related to existing w ater harvestin	ha	100	-	-	-	-	-	-	100	3,000	300,000.0	-	-	-	-	-	-	300,000.0
3. Bubbler irrigation and mulching	ha	-	6.6	6.6	6.6	-	-	-	19.8	4,400	-	29,040.0	29,040.0	29,040.0	-	-	-	87,120.0
4. GR drip irrigation	ha	-	247	247	247	-	-	-	741	3,500	-	864,500.0	864,500.0	864,500.0	-	-	-	2,593,500.0
5. GR drip irrigation, mulching and mesh protection	ha	-	62	62	62	-	-	-	186	4,700	-	291,400.0	291,400.0	291,400.0	-	-	-	874,200.0
Subtotal											405,000.0	1,319,940.0	1,289,940.0	1,184,940.0	-	-	-	4,199,820.0
C. Crop diversification																		
1. Green houses	units	150	200	100	-	-	-	-	450	5,000	750,000.0	1,000,000.0	500,000.0	-	-	-	-	2,250,000.0
2. Demonstration of crops/seeds climate change resili	lumpsum										-	62,500.0	62,500.0	62,500.0	62,500.0	-	-	250,000.0
Subtotal											750,000.0	1,062,500.0	562,500.0	62,500.0	62,500.0	-	-	2,500,000.0
D. Research and development																		
1. Green house unit for research station /a	unit	-	1	-	-	-	-	-	1	18,000	-	18,000.0	-	-	-	-	-	18,000.0
2. Support to AREA on alternative and potential crop research																		
Post-harvest operation research	trial	-	1	1	-	-	-	-	2	15,000	-	15,000.0	15,000.0	-	-	-	-	30,000.0
Improvement of management efficiency and utilisatic	trial	1	1	-	-	-	-	-	2	30,000	30,000.0	30,000.0	-	-	-	-	-	60,000.0
Genetic improvement of drough and heat -tolerant v	trial	-	1	1	-	-	-	-	2	60,000	-	60,000.0	60,000.0	-	-	-	-	120,000.0
Multiplication of doum and coconut	trial	-	-	1	1	-	-	-	2	50,000	-	-	50,000.0	50,000.0	-	-	-	100,000.0
Subtotal											30,000.0	105,000.0	125,000.0	50,000.0	-	-	-	310,000.0
Subtotal											30,000.0	123,000.0	125,000.0	50,000.0	-	-	-	328,000.0
Total											1,269,000.0	2,891,848.0	2,514,848.0	1,564,848.0	62,500.0	-	-	8,303,044.0

\a 41x9m, including structure, drip irrigation, solar cell w ith accessories, electric pump, storage 30m3

Yemen
Rural Growth Program
Table 16. Component 4. Project management. Al Dhala.
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Project management unit																		
1. Vehicles	unit	3	-	-	-	-	-	-	3	27,000	81,000.0	-	-	-	-	-	-	81,000.0
2. Equipment and material																		
Desktop computers	unit	4	-	-	-	-	-	-	4	1,500	6,000.0	-	-	-	-	-	-	6,000.0
Laptop	unit	6	-	-	-	-	-	-	6	1,000	6,000.0	-	-	-	-	-	-	6,000.0
Projector	unit	1	-	-	-	-	-	-	1	600	600.0	-	-	-	-	-	-	600.0
Printer	unit	2	-	-	-	-	-	-	2	1,000	2,000.0	-	-	-	-	-	-	2,000.0
GPS	unit	3	-	-	-	-	-	-	3	600	1,800.0	-	-	-	-	-	-	1,800.0
Camera	unit	2	-	-	-	-	-	-	2	600	1,200.0	-	-	-	-	-	-	1,200.0
Office furnitures	unit	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Subtotal											27,600.0	-	-	-	-	-	-	27,600.0
3. Studies																		
Start-up workshop	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Baseline survey	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Mid-term review	lumpsum	-	-	1	-	1	-	-	2	15,000	-	-	15,000.0	-	15,000.0	-	-	30,000.0
Impact survey	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Completion report	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Subtotal											20,000.0	-	15,000.0	-	15,000.0	-	20,000.0	70,000.0
4. Capacity building																		
Trainings	lumpsum										30,000.0	-	15,000.0	-	-	-	-	45,000.0
International TA	lumpsum										50,000.0	50,000.0	-	-	-	-	-	100,000.0
International TA for field managers	lumpsum	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											92,500.0	62,500.0	15,000.0	-	-	-	-	170,000.0
Total Investment Costs											221,100.0	62,500.0	30,000.0	-	15,000.0	-	20,000.0	348,600.0
II. Recurrent Costs																		
A. Personnel																		
PMU manager	pers month	12	12	12	12	12	12	12	84	1,500	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	126,000.0
Accountant	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
Procurement officer	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
M&E specialist	pers month	12	12	12	12	12	12	12	84	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	109,200.0
Rural engineer	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Gender and community development	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Field managers	pers month	24	24	24	24	24	24	24	168	600	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	100,800.0
Secretary	pers month	12	12	12	12	12	12	12	84	500	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	42,000.0
Drivers	pers month	36	36	36	36	36	36	36	252	250	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	63,000.0
Per diems and allowance	limpsim										20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Subtotal											140,600.0	140,600.0	140,600.0	140,600.0	140,600.0	109,400.0	109,400.0	921,800.0
B. Operation and maintenance																		
Vehicles	lumpsum	3	3	3	3	3	3	3	21	5,400	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	113,400.0
Other equipment	lumpsum	1	1	1	1	1	1	1	7	5,200	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	36,400.0
Office running costs	lumpsum	1	1	1	1	1	1	1	7	3,000	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	21,000.0
Steering comittee meetings	lumpsum	1	1	1	1	1	1	1	7	700	700.0	700.0	700.0	700.0	700.0	700.0	700.0	4,900.0
Subtotal											25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	175,700.0
Total Recurrent Costs											165,700.0	165,700.0	165,700.0	165,700.0	165,700.0	134,500.0	134,500.0	1,097,500.0
Total											386,800.0	228,200.0	195,700.0	165,700.0	180,700.0	134,500.0	154,500.0	1,446,100.0

Yemen
Rural Growth Program
Table 17. Component 4. Project management. Dhamar
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Project management unit																		
1. Vehicles	unit	3	-	-	-	-	-	-	3	27,000	81,000.0	-	-	-	-	-	-	81,000.0
2. Equipment and material																		
Desktop computers	unit	4	-	-	-	-	-	-	4	1,500	6,000.0	-	-	-	-	-	-	6,000.0
Laptop	unit	6	-	-	-	-	-	-	6	1,000	6,000.0	-	-	-	-	-	-	6,000.0
Projector	unit	1	-	-	-	-	-	-	1	600	600.0	-	-	-	-	-	-	600.0
Printer	unit	2	-	-	-	-	-	-	2	1,000	2,000.0	-	-	-	-	-	-	2,000.0
GPS	unit	3	-	-	-	-	-	-	3	600	1,800.0	-	-	-	-	-	-	1,800.0
Camera	unit	2	-	-	-	-	-	-	2	600	1,200.0	-	-	-	-	-	-	1,200.0
Office furnitures	unit	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Subtotal											27,600.0	-	-	-	-	-	-	27,600.0
3. Studies																		
Start-up workshop	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Baseline survey	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Mid-term review	lumpsum	-	-	1	-	1	-	-	2	15,000	-	-	15,000.0	-	15,000.0	-	-	30,000.0
Impact survey	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Completion report	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Subtotal											20,000.0	-	15,000.0	-	15,000.0	-	20,000.0	70,000.0
4. Capacity building																		
Trainings	lumpsum										30,000.0	-	15,000.0	-	-	-	-	45,000.0
International TA	lumpsum										50,000.0	50,000.0	-	-	-	-	-	100,000.0
International TA for field ma	lumpsum	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											92,500.0	62,500.0	15,000.0	-	-	-	-	170,000.0
Total Investment Costs											221,100.0	62,500.0	30,000.0	-	15,000.0	-	20,000.0	348,600.0
II. Recurrent Costs																		
A. Personnel																		
PMU manager	pers month	12	12	12	12	12	12	12	84	1,500	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	126,000.0
Accountant	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
Procurement officer	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
M&E specialist	pers month	12	12	12	12	12	12	12	84	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	109,200.0
Rural engineer	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Gender and community develc	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Field managers	pers month	24	24	24	24	24	24	24	168	600	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	100,800.0
Secretary	pers month	12	12	12	12	12	12	12	84	500	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	42,000.0
Drivers	pers month	36	36	36	36	36	36	36	252	250	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	63,000.0
Per diems and allowance	limpsim										20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Subtotal											140,600.0	140,600.0	140,600.0	140,600.0	140,600.0	109,400.0	109,400.0	921,800.0
B. Operation and maintenance																		
Vehicles	lumpsum	3	3	3	3	3	3	3	21	5,400	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	113,400.0
Other equipment	lumpsum	1	1	1	1	1	1	1	7	5,200	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	36,400.0
Office running costs	lumpsum	1	1	1	1	1	1	1	7	3,000	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	21,000.0
Steering comittee meetings	lumpsum	1	1	1	1	1	1	1	7	700	700.0	700.0	700.0	700.0	700.0	700.0	700.0	4,900.0
Subtotal											25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	175,700.0
Total Recurrent Costs											165,700.0	165,700.0	165,700.0	165,700.0	165,700.0	134,500.0	134,500.0	1,097,500.0
Total											386,800.0	228,200.0	195,700.0	165,700.0	180,700.0	134,500.0	154,500.0	1,446,100.0

Yemen
Rural Growth Program
Table 18. Component 4. Project management. Hodeida
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Project management unit																		
1. Vehicles	unit	3	-	-	-	-	-	-	3	27,000	81,000.0	-	-	-	-	-	-	81,000.0
2. Equipment and material																		
Desktop computers	unit	4	-	-	-	-	-	-	4	1,500	6,000.0	-	-	-	-	-	-	6,000.0
Laptop	unit	6	-	-	-	-	-	-	6	1,000	6,000.0	-	-	-	-	-	-	6,000.0
Projector	unit	1	-	-	-	-	-	-	1	600	600.0	-	-	-	-	-	-	600.0
Printer	unit	2	-	-	-	-	-	-	2	1,000	2,000.0	-	-	-	-	-	-	2,000.0
GPS	unit	3	-	-	-	-	-	-	3	600	1,800.0	-	-	-	-	-	-	1,800.0
Camera	unit	2	-	-	-	-	-	-	2	600	1,200.0	-	-	-	-	-	-	1,200.0
Office furnitures	unit	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Subtotal											27,600.0	-	-	-	-	-	-	27,600.0
3. Studies																		
Start-up w orkshop	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Baseline survey	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Mid-term review	lumpsum	-	-	1	-	1	-	-	2	15,000	-	-	15,000.0	-	15,000.0	-	-	30,000.0
Impact survey	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Completion report	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Subtotal											20,000.0	-	15,000.0	-	15,000.0	-	20,000.0	70,000.0
4. Capacity building																		
Trainings	lumpsum										30,000.0	-	15,000.0	-	-	-	-	45,000.0
International TA	lumpsum										50,000.0	50,000.0	25,000.0	-	-	-	-	125,000.0
International TA for field m	lumpsum	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											92,500.0	62,500.0	40,000.0	-	-	-	-	195,000.0
Total Investment Costs											221,100.0	62,500.0	55,000.0	-	15,000.0	-	20,000.0	373,600.0
II. Recurrent Costs																		
A. Personnel																		
PMU manager	pers month	12	12	12	12	12	12	12	84	1,500	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	126,000.0
Accountant	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
Procurement officer	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
M&E specialist	pers month	12	12	12	12	12	12	12	84	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	109,200.0
Rural engineer	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Gender and community deve	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Field managers	pers month	24	24	24	24	24	24	24	168	600	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	100,800.0
Secretary	pers month	12	12	12	12	12	12	12	84	500	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	42,000.0
Drivers	pers month	36	36	36	36	36	36	36	252	250	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	63,000.0
Per diems and allow ance	limpsim										20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Subtotal											140,600.0	140,600.0	140,600.0	140,600.0	140,600.0	109,400.0	109,400.0	921,800.0
B. Operation and maintenance																		
Vehicles	lumpsum	3	3	3	3	3	3	3	21	5,400	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	113,400.0
Other equipment	lumpsum	1	1	1	1	1	1	1	7	5,200	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	36,400.0
Office running costs	lumpsum	1	1	1	1	1	1	1	7	3,000	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	21,000.0
Steering comittee meetings	lumpsum	1	1	1	1	1	1	1	7	700	700.0	700.0	700.0	700.0	700.0	700.0	700.0	4,900.0
Subtotal											25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	175,700.0
Total Recurrent Costs											165,700.0	165,700.0	165,700.0	165,700.0	165,700.0	134,500.0	134,500.0	1,097,500.0
Total											386,800.0	228,200.0	220,700.0	165,700.0	180,700.0	134,500.0	154,500.0	1,471,100.0

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Rural Grow th Program
Table 19. Component 4. Project management. Lahej
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Project management unit																		
1. Vehicles	unit	3	-	-	-	-	-	-	3	27,000	81,000.0	-	-	-	-	-	-	81,000.0
2. Equipment and material																		
Desktop computers	unit	4	-	-	-	-	-	-	4	1,500	6,000.0	-	-	-	-	-	-	6,000.0
Laptop	unit	6	-	-	-	-	-	-	6	1,000	6,000.0	-	-	-	-	-	-	6,000.0
Projector	unit	1	-	-	-	-	-	-	1	600	600.0	-	-	-	-	-	-	600.0
Printer	unit	2	-	-	-	-	-	-	2	1,000	2,000.0	-	-	-	-	-	-	2,000.0
GPS	unit	3	-	-	-	-	-	-	3	600	1,800.0	-	-	-	-	-	-	1,800.0
Camera	unit	2	-	-	-	-	-	-	2	600	1,200.0	-	-	-	-	-	-	1,200.0
Office furnitures	unit	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Subtotal											27,600.0	-	-	-	-	-	-	27,600.0
3. Studies																		
Start-up w orkshop	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Baseline survey	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Mid-term review	lumpsum	-	-	1	-	1	-	-	2	15,000	-	-	15,000.0	-	15,000.0	-	-	30,000.0
Impact survey	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Completion report	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Subtotal											20,000.0	-	15,000.0	-	15,000.0	-	20,000.0	70,000.0
4. Capacity building																		
Trainings	lumpsum										30,000.0	-	15,000.0	-	-	-	-	45,000.0
International TA	lumpsum										50,000.0	50,000.0	25,000.0	-	-	-	-	125,000.0
International TA for field r	lumpsum	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											92,500.0	62,500.0	40,000.0	-	-	-	-	195,000.0
Total Investment Costs											221,100.0	62,500.0	55,000.0	-	15,000.0	-	20,000.0	373,600.0
II. Recurrent Costs																		
A. Personnel																		
PMU manager	pers month	12	12	12	12	12	12	12	84	1,500	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	126,000.0
Accountant	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
Procurement officer	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
M&E specialist	pers month	12	12	12	12	12	12	12	84	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	109,200.0
Rural engineer	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Gender and community dev	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Field managers	pers month	24	24	24	24	24	24	24	168	600	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	100,800.0
Secretary	pers month	12	12	12	12	12	12	12	84	500	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	42,000.0
Drivers	pers month	36	36	36	36	36	36	36	252	250	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	63,000.0
Per diems and allow ance	limpsim										20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Subtotal											140,600.0	140,600.0	140,600.0	140,600.0	140,600.0	109,400.0	109,400.0	921,800.0
B. Operation and maintenance																		
Vehicles	lumpsum	3	3	3	3	3	3	3	21	5,400	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	113,400.0
Other equipment	lumpsum	1	1	1	1	1	1	1	7	5,200	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	36,400.0
Office running costs	lumpsum	1	1	1	1	1	1	1	7	3,000	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	21,000.0
Steering comittee meetings	lumpsum	1	1	1	1	1	1	1	7	700	700.0	700.0	700.0	700.0	700.0	700.0	700.0	4,900.0
Subtotal											25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	175,700.0
Total Recurrent Costs											165,700.0	165,700.0	165,700.0	165,700.0	165,700.0	134,500.0	134,500.0	1,097,500.0
Total											386,800.0	228,200.0	220,700.0	165,700.0	180,700.0	134,500.0	154,500.0	1,471,100.0

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Rural Growth Program
Table 20. Component 4. Project management. Taiz
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Project management unit																		
1. Vehicles	unit	3	-	-	-	-	-	-	3	27,000	81,000.0	-	-	-	-	-	-	81,000.0
2. Equipment and material																		
Desktop computers	unit	4	-	-	-	-	-	-	4	1,500	6,000.0	-	-	-	-	-	-	6,000.0
Laptop	unit	6	-	-	-	-	-	-	6	1,000	6,000.0	-	-	-	-	-	-	6,000.0
Projector	unit	1	-	-	-	-	-	-	1	600	600.0	-	-	-	-	-	-	600.0
Printer	unit	2	-	-	-	-	-	-	2	1,000	2,000.0	-	-	-	-	-	-	2,000.0
GPS	unit	3	-	-	-	-	-	-	3	600	1,800.0	-	-	-	-	-	-	1,800.0
Camera	unit	2	-	-	-	-	-	-	2	600	1,200.0	-	-	-	-	-	-	1,200.0
Office furnitures	unit	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Subtotal											27,600.0	-	-	-	-	-	-	27,600.0
3. Studies																		
Start-up workshop	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Baseline survey	lumpsum	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Mid-term review	lumpsum	-	-	1	-	1	-	-	2	15,000	-	-	15,000.0	-	15,000.0	-	-	30,000.0
Impact survey	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Completion report	lumpsum	-	-	-	-	-	-	1	1	10,000	-	-	-	-	-	-	10,000.0	10,000.0
Subtotal											20,000.0	-	15,000.0	-	15,000.0	-	20,000.0	70,000.0
4. Capacity building																		
Trainings	lumpsum										30,000.0	-	15,000.0	-	-	-	-	45,000.0
International TA	lumpsum										50,000.0	50,000.0	25,000.0	-	-	-	-	125,000.0
International TA for field m	lumpsum	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											92,500.0	62,500.0	40,000.0	-	-	-	-	195,000.0
Total Investment Costs											221,100.0	62,500.0	55,000.0	-	15,000.0	-	20,000.0	373,600.0
II. Recurrent Costs																		
A. Personnel																		
PMU manager	pers month	12	12	12	12	12	12	12	84	1,500	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	126,000.0
Accountant	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
Procurement officer	pers month	12	12	12	12	12	12	12	84	1,100	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	13,200.0	92,400.0
M&E specialist	pers month	12	12	12	12	12	12	12	84	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	109,200.0
Rural engineer	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Gender and community deve	pers month	12	12	12	12	12	-	-	60	1,300	15,600.0	15,600.0	15,600.0	15,600.0	15,600.0	-	-	78,000.0
Field managers	pers month	24	24	24	24	24	24	24	168	600	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	14,400.0	100,800.0
Secretary	pers month	12	12	12	12	12	12	12	84	500	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	42,000.0
Drivers	pers month	36	36	36	36	36	36	36	252	250	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	9,000.0	63,000.0
Per diems and allowance	limpsim										20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Subtotal											140,600.0	140,600.0	140,600.0	140,600.0	140,600.0	109,400.0	109,400.0	921,800.0
B. Operation and maintenance																		
Vehicles	lumpsum	3	3	3	3	3	3	3	21	5,400	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	113,400.0
Other equipment	lumpsum	1	1	1	1	1	1	1	7	5,200	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	36,400.0
Office running costs	lumpsum	1	1	1	1	1	1	1	7	3,000	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	21,000.0
Steering comittee meetings	lumpsum	1	1	1	1	1	1	1	7	700	700.0	700.0	700.0	700.0	700.0	700.0	700.0	4,900.0
Subtotal											25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	175,700.0
Total Recurrent Costs											165,700.0	165,700.0	165,700.0	165,700.0	165,700.0	134,500.0	134,500.0	1,097,500.0
Total											386,800.0	228,200.0	220,700.0	165,700.0	180,700.0	134,500.0	154,500.0	1,471,100.0

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Rural Grow th Program
Table 21. Component 4. Project management. NPCU
Detailed Costs
(US$)

		Quantities									Base Cost							
	Unit	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total	Unit Cost	PY1	PY2	PY3	PY4	PY5	PY6	PY7	Total
I. Investment Costs																		
A. Project management unit																		
1. Vehicles	unit	2	-	-	-	-	-	-	2	27,000	54,000.0	-	-	-	-	-	-	54,000.0
2. Equipment and material																		
Desktop computers	unit	4	-	-	-	-	-	-	4	1,500	6,000.0	-	-	-	-	-	-	6,000.0
Laptop	unit	6	-	-	-	-	-	-	6	1,000	6,000.0	-	-	-	-	-	-	6,000.0
Projector	unit	1	-	-	-	-	-	-	1	600	600.0	-	-	-	-	-	-	600.0
Printer	unit	2	-	-	-	-	-	-	2	1,000	2,000.0	-	-	-	-	-	-	2,000.0
GPS	unit	3	-	-	-	-	-	-	3	600	1,800.0	-	-	-	-	-	-	1,800.0
Camera	unit	2	-	-	-	-	-	-	2	600	1,200.0	-	-	-	-	-	-	1,200.0
Office furnitures	unit	1	-	-	-	-	-	-	1	10,000	10,000.0	-	-	-	-	-	-	10,000.0
Subtotal											27,600.0	-	-	-	-	-	-	27,600.0
3. Studies																		
Start-up w orkshop	lumpsum	1	-	-	-	-	-	-	1	20,000	20,000.0	-	-	-	-	-	-	20,000.0
Baseline survey	lumpsum	1	-	-	-	-	-	-	1	30,000	30,000.0	-	-	-	-	-	-	30,000.0
Tri-term review	lumpsum	-	-	1	-	1	-	-	2	30,000	-	-	30,000.0	-	30,000.0	-	-	60,000.0
Completion w orkshop	lumpsum	-	-	-	-	-	-	1	1	20,000	-	-	-	-	-	-	20,000.0	20,000.0
Completion report	lumpsum	-	-	-	-	-	-	1	1	20,000	-	-	-	-	-	-	20,000.0	20,000.0
K&M and M&E meetings	lumpsum	1	1	1	1	1	1	1	7	20,000	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Annual audit	lumpsum	1	1	1	1	1	1	1	7	20,000	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Subtotal											90,000.0	40,000.0	70,000.0	40,000.0	70,000.0	40,000.0	80,000.0	430,000.0
4. Capacity building																		
Trainings	lumpsum										25,000.0	25,000.0	25,000.0	-	-	-	-	75,000.0
International TA	pers month	3	2	1	1	-	-	-	7	25,000	75,000.0	50,000.0	25,000.0	25,000.0	-	-	-	175,000.0
Allocation for Al Baida gc	lumpsum										-	250,000.0	250,000.0	500,000.0	-	-	-	1,000,000.0
International TA for field r	lumpsum	0.5	0.5	-	-	-	-	-	1	25,000	12,500.0	12,500.0	-	-	-	-	-	25,000.0
Subtotal											112,500.0	337,500.0	300,000.0	525,000.0	-	-	-	1,275,000.0
Total Investment Costs											284,100.0	377,500.0	370,000.0	565,000.0	70,000.0	40,000.0	80,000.0	1,786,600.0
II. Recurrent Costs																		
A. Personnel																		
NPCU manager	pers month	12	12	12	12	12	12	12	84	1,800	21,600.0	21,600.0	21,600.0	21,600.0	21,600.0	21,600.0	21,600.0	151,200.0
Finance manager	pers month	12	12	12	12	12	12	12	84	1,500	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	18,000.0	126,000.0
Internal audit	pers month	12	12	12	12	12	12	12	84	1,400	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	117,600.0
Consolidation accountant	pers month	12	12	12	12	12	12	12	84	1,400	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	117,600.0
Senior procurement officer	pers month	12	12	12	12	12	-	-	60	1,400	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	-	-	84,000.0
Senior M&E/K&M specialist	pers month	12	12	12	12	12	-	-	60	1,400	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	-	-	84,000.0
Environment and climate ch	pers month	12	12	12	12	12	-	-	60	1,400	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	-	-	84,000.0
Gender management/rural f	pers month	12	12	12	12	12	12	12	84	1,400	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	16,800.0	117,600.0
Secretary	pers month	12	12	12	12	12	12	12	84	500	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	42,000.0
Suppost staff	pers month	24	24	24	24	24	24	24	168	200	4,800.0	4,800.0	4,800.0	4,800.0	4,800.0	4,800.0	4,800.0	33,600.0
Drivers	pers month	24	24	24	24	24	24	24	168	250	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	42,000.0
Per diems and allow ances	limpsum										20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	140,000.0
Subtotal											177,200.0	177,200.0	177,200.0	177,200.0	177,200.0	126,800.0	126,800.0	1,139,600.0
B. Operation and maintenance																		
Vehicles	lumpsum	3	3	3	3	3	3	3	21	5,400	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	16,200.0	113,400.0
Other equipment	lumpsum	1	1	1	1	1	1	1	7	5,200	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	5,200.0	36,400.0
Office running costs	lumpsum	1	1	1	1	1	1	1	7	3,000	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	3,000.0	21,000.0
Steering comittee meetings	lumpsum	1	1	1	1	1	1	1	7	700	700.0	700.0	700.0	700.0	700.0	700.0	700.0	4,900.0
Subtotal											25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	25,100.0	175,700.0
Total Recurrent Costs											202,300.0	202,300.0	202,300.0	202,300.0	202,300.0	151,900.0	151,900.0	1,315,300.0
Total											486,400.0	579,800.0	572,300.0	767,300.0	272,300.0	191,900.0	231,900.0	3,101,900.0

Appendix 10: Economic and Financial Analysis

A. Introduction

1. This working paper presents the financial and economic analysis of the Rural Growth Programme (mentioned hereafter as RGP). The financial analysis aims at demonstrating that income-generating activities on farm (related to the main commodities supported by the programme) as proposed in the RGP, are profitable and therefore sustainable. On the other hand, the economic analysis aims at demonstrating that, from an economic perspective, the programme as a whole is viable, taking into account, as much as possible, all quantifiable and additional costs and benefits in situations with and without programme.

2. The programme design process has been unusual due to the security conditions prevailing in Yemen. Yemen is currently in phases 3 to 5 (moderate to high) depending on the location, with Sana'a in phase 4 (substantial). Given some limitations in organization of field missions, the programme design as well as financial and economic analysis have been carried as follows: (i) in-country: field missions (surveys, studies, modular design proposals) by local consultants supported by the ICO and PMUs; (ii) in Rome: data consolidation and production of the design documents, led by the CPM and supported by the CPMT. In December 2012-early 2013, a design mission was fielded by IFAD with the objective of finalizing the documents and have them validated by PMUs and endorsed by the Government.

3. The programme will consider investing in four components: (i) community resilience; (ii) water, land and energy; (iii)infrastructure, and (iv) agriculture and prop production promotion. These could reflect the scaling up of successful activities of the three ongoing projects. The final list of components and activities will be defined during detailed design. A particular focus will be placed on supporting adaptation to climate change. It will scale up operations in Dhamar and Al Dhala governorates to reach additional communities, and then expand to Hodeida, Lahej and Taiz.

4. The working paper is structured as follows: (i) data sources and general assumptions; (ii) summary of the programme benefits; (iii) financial analysis; (iv) economic analysis; and (v) sensitivity analysis.

B. Data sources and general assumptions

5. **Sources**. The data used in this analysis have been collected from various sources, including the Ministry of Agriculture and Irrigation, the existing PMU in Dhamar, as well as from potential partners (European Union, Islamic Development Bank[28], Ministry of Finance, and Fisheries Production Promotion Fund) operating in Yemen, local agricultural practitioners and missions' estimates. Additional data were collected during field design missions in December 2012-early 2013, as well as from the three on-going IFAD-financed projects: the Dhamar Participatory Rural Development Project (DPRDP); the Community-Based Rural Infrastructure Project (CBRIP), and the Al-Dhala Community Resource Management Project (ADCRMP).

6. **Currency and exchange rate**. On the subject of Yemeni national currency (Yemeni riyal [YER]), it should be noted that in the wake of the unrest that began in early 2011 the riyal came under severe downward pressure. In response, the Central Bank kept the official rate steady at YR 214 = USD$1.00. The same exchange rate has been used throughout the present analysis.

7. **Prices**. Input and output prices were derived from the Economic Opportunities Programme (EOP) that was recently formulated in the similar programme area, as well as from the on-going DPRDP, CBRIP and ADCRMP as the RGP will scale up, to incremental communities and governorate,

[28] The Islamic Development Bank conducted a design mission from January 8th to 15th. An agreement for a co-financing of the Rural Growth Programme has been reached. A final design mission would be launched in April 2013 and a Board decision is expected for June 2013.

the successful approaches, methodologies, and activities of these three projects. Standard conversion factor has been used in economic analysis to adjust the local content of costs assumed to be non-traded[29]. A significant distortion was perceived in the market prices with respect to border prices was with sorghum grain, for which a conversion factor[30] of 0.6 was applied for the economic analysis. Shadow prices for rural labor were estimated at 70% of the prevailing market wage rate, while for skilled labor, the market rate was assumed to reflect its opportunity cost.

8. **Crop and activity models**. In the present case, crop models represent a complementary activity (additional) to the ongoing income-generating activities carried out by small farms. The models show the incremental revenues and costs generated by the new investments.

C. Summary of the programme benefits

9. **Quantifiable benefits.** The main quantifiable benefits expected from the programme will comprise following elements:

- increased agricultural (crop) production due to better access to inputs, more efficient irrigation system and provision of updated technical assistance by VAT staff;
- increased livestock production due to better provision of animal husbandry, veterinary services and improved breeding management;
- increase in irrigated area through development of irrigation structures and improved water resources management; these investments resulting in increased crops yields and ability to move into higher value crops such as vegetables as well as increased fodder production supporting higher livestock production;
- arresting environmental degradation and restoring abandoned land to productive use though the soil conservation activities such as terrace rehabilitation contributing to an increase in the crop production;
- enhanced access to financial resources through Saving and Credit Associations and later other microfinance institutions/banks which will enable financing agricultural needs as well as implementation and development of income generating activities;
- improved access to drinking water involving less labor and collection time. Women and children (mainly girls) will benefit in the first place as they are the ones in charge of water collection which takes up to 3 hours a day and impacts negatively on girls' school attendance. Reduced workload will enable women to focus on more productive activities and/or to participate in training and capacity building activities while girls will have opportunity to continue attending school;
- implementation of renewable energy projects such as photovoltaic systems, solar energy systems and improved kitchen stoves resulting in incremental time for both women and girls to productive and empowering activities and in positive environmental impact through mitigation of pollution caused by fossil fuels use;
- improved access due to construction/rehabilitation of village roads. Economic benefits from improved village roads will be generated through lower transportation costs, reduced average travel time, improved access to agricultural inputs, and increased income due to market access. Social benefits will result in improved access to school and health facilities, incremental time available for women and girls for more productive or empowering activities, increased labor mobility, and improved information, knowledge and skills dissemination.

[29] Assumption used in the Economic Opportunity Programme by IFAD (January 2010)
[30] Assumptions used in the ICR of the Irrigation Improvement Project by the World Bank (June 2009).

10. **Non-quantified Benefits**. In addition, the programme is expected to generate non-quantified benefits in terms of capacity building and empowerment of the poor communities (especially women and youth). In particular, the following benefits will be important:

- Implementation of Community Action Plans enabling communities to participate in the planning of their own development
- Users' associations vested with the responsibility of operating and maintaining infrastructure such as water harvesting infrastructure, drinking water schemes, rehabilitated land, roads, and renewable energy schemes;
- Literacy, life-skills training as well as business management and technical trainings also contribute to community empowerment particularly women and youth.
- The institutional strengthening of the communities, coupled with training in irrigation practice and adoption of participatory approaches for local planning, will result in more ownership and better control by these communities of the irrigation structures put into place for their benefit. It should also result in less social conflicts and better relations with the local authorities.

D. Financial analysis

11. The objectives of the financial analysis are to: (i) assess the financial viability of the improved technologies and systems promoted by the programme and (ii) evaluate the impact of the programme's interventions on the cash flow and household incomes of the farmers involved.

12. To assess the financial viability of the improved technologies, a number of indicative activities, which will benefit from RGP, were identified during the programme design process.

13. According to FAO/WFP Crop and Food Security Assessment Mission to Yemen, rural Yemen is largely dominated by agriculture and livestock rearing. Grains such as sorghum, wheat, millet, maize and barley account for 58% of the area planted while cash crops (17%), fruits and vegetables (12%), animal fodder (10%) and pulses (4%) accounting for the remainder. Additionally, in cash crop dependent zones, food crops are often forfeited for high□valued crops such as qat, coffee, cotton, sesame, and tobacco. In addition to agriculture, livestock ownership is an integral component to rural Yemeni livelihoods. In general, most households own livestock (goats, sheep, cattle, and camels) and rely on both the consumption of livestock products and livestock sales.

14. Agricultural products considered in the analysis are the most popular for the programme area. In total several illustrative crop and livestock budgets were prepared to illustrate the impact of the potential investments on agricultural production.

Agricultural /Crop budgets.

15. **Key assumptions**. The parameters (yields, assumptions on the yield increase) for the models are based on the information collected from the experience of previous programmes financed in the same programme area. These crop budgets present detailed annual expenses, including seeds, inputs, land preparation and labor and estimate average yields in various production conditions, reflecting average performances in no irrigation or poor irrigation conditions (corresponding to the "without programme conditions") and adequate irrigation conditions ("with programme conditions").

16. For the purpose of the analysis several models have been prepared, including: wheat, sorghum, tomatoes, potatoes, coffee (new plantation) and lentil. Detailed crop and livestock models are provided in the Appendix to this Working Paper.

17. **Increased rainfed cereal (wheat and sorghum) and rainfed vegetables (tomato and potato) and legumes (lentil) production.** These models illustrate the impact of the adoption of better irrigation practices on the cereals and vegetables yields. Wheat and sorghum model have been used as proxy for cereals and tomato and potato model as a proxy for vegetable crops being grown both in rain feed and irrigated systems. Incremental revenue is derived from increased water availability and improved irrigation techniques. In addition to the on-farm irrigation systems the programme will

provide training to farmers on crop water requirement and irrigation schedule calculations and establishment of WUAs.

18. **Increased high value crops (coffee) production. Establishment of new plantation.** In the case of rehabilitation of abandoned terraces, it's been assumed that these areas will be put back into productive use through establishment high value crops production. This model illustrates the financial impact for a farmer who decides to invest in the establishment of a small coffee plantation. Investment costs for inputs incurred during the first year include land preparation, seedlings and inputs. The first production is harvested in the third year at 20% of the expected yield, with maturity in the seventh year after establishment. During the period between the investment and the realization of the full yield, however, the farmer will experience a significant drop in cash income, although at the same time, the farm will be adding to its net worth. It will be crucial for the farmer to be fully aware of this phenomenon prior to the investment being made, so that adequate provision can be made to cover this shortfall (from other farm or off-farm income, remittances, etc.). The detailed model is presented in the Appendix.

19. **Increased livestock production**. The model illustrates the likely returns over time to smallholders participating in this programme and adopting improved husbandry practices (hygiene, vaccination and supplementary feed) as well as having better access to irrigation infrastructure and animal watering. The model is an aggregation of 100 small stables (owning 1 head of cattle and 6 small ruminants each) because projecting the herd composition on a small farm when larger animals are to be produced introduces the problems of divisibility. Technical coefficients such as mortality or calving rates, applied to small farms, lead to "fractional animals".

20. The existing animal husbandry practices limit the milk and meat yields keeping them below the potential. Low animal productivity and profitability in livestock husbandry is due to inappropriate livestock feeding practices, limited availability of clean drinking water, poor housing and livestock husbandry practices. Furthermore, limited access to short and medium-term financing prevents smallholder farmers from investing in the rehabilitation and upgrading of their farm. The main challenge smallholder farmers are facing in the programme area is to optimize the benefits of mixed farming (crop and livestock production together) by using productivity enhancing technologies. It was conservatively estimated that the meat and milk production could increase by a minimum of 10% over time following substantially better water supply and from adoption of improved feeding regime. The model is presented in the Appendix.

E. Economic analysis

21. **Cost Stream**. In order to estimate the programme's economic viability, in the form of the Economic Internal Rate of Return (EIRR), the cash flow calculated includes the programme base costs (as extracted from the COSTAB tables shown in the Appendix) with their physical contingencies but without taxes and price contingencies (therefore in constant YER). The costs include all investments for all programme components as well as their replacement (for transportation, office and computer equipment/materials, etc.) and recurrent costs (mainly operation and maintenance for transportation, equipment and materials). Cost stream calculation is presented in the Appendix.

22. **Benefit Stream**. The analysis attempts to identify quantifiable benefits related to the activities undertaken following the implementation of the components of the programme. The incremental quantifiable benefit stream comprises following elements: (i) integrated watershed development schemes; (ii) benefits from dams and spate irrigation and associated irrigation systems; (iii) improved and facilitated access to drinking water; (iv) land rehabilitation and productive use of rehabilitated land; (v) benefits from agricultural roads construction.

23. The illustrative crop models prepared for the purpose of the financial analysis and described above have been used for the calculation of the overall benefit stream. In addition to that, for the economic analysis separate models have been developed to illustrate the benefits from watershed management and roads infrastructure development.

24. **Integrated watershed development scheme model**. The model presents a combination of three activities carried out within each selected scheme: (i) water harvesting infrastructure for crop irrigation and animal watering, (ii) land management/terraces rehabilitation and (iii) drinking water facilities.

25. A typical irrigation scheme will comprise: dam, reservoir, tank for drinking water and conveyance network up to field edge). Assumptions are based on the studies carries out in Yemen for similar irrigation activities (under EOP and DPRDP) and on the missions' estimates. The costs of the schemes include the cost of civil works of the infrastructure as estimated in the cost tables. Finally, the cost of ensuring annual maintenance of these schemes was assumed to correspond to 2% of construction cost of the water reservoir and the irrigation network. Costs and benefits were aggregated over a 20 year period in order to calculate both the internal rate of return (IRR) and Net Present Value (NPV). In view of the small size of the structures, construction will take one year and benefits could start materializing during the second year. Maintenance cost are assumed to remain constant, starting in Year 2. In doing this, agricultural benefits have been assumed to progressively increase to reach full benefits in Year 7 after the initial construction of the infrastructure. The model is presented in the Appendix.

26. **Rural road model**. Incremental benefits were computed for agricultural roads following the method valuing increase in transported goods and savings in travel time. The construction costs as well as routine and periodic maintenance costs of the roads are estimated on the basis of information given by the engineers involved. Time savings for the population served by the road (valued at the opportunity cost of unskilled labor) was estimated following interviews in the field. The model illustrates the incremental benefits from construction of a rural road of 5 km. It is assumed that the beneficiaries within the road catchment area are composed of about 10 households per km of road. The benefits will be derived from the increased volume of transported cash crops (potatoes have been used as proxy) for sale, plus the reduced travel time. The volumes of transported products for selected beneficiaries are those reported in the crop budgets presented in earlier sections. Annual costs for road O&M are assumed to be two percent of the investment costs starting after the investment. The model is presented in the Appendix.

27. **Programme Estimated Return**. The base case Economic Internal Rate of Return (EIRR) is estimated at 25 percent. It has to be noted that the base EIRR includes the costs of all investments for all programme components as well as their replacement and recurrent costs; on the benefits side, it includes exclusively the benefits quantified previously. The base case net present value of the programme's net benefit stream, discounted at 10 percent, is YER 25 billion. The summary of the economic analysis is presented in the Appendix.

28. **Sensitivity analysis**. Sensitivity analysis assessed the effect of variations in benefits and costs and for various lags in the realization of benefits. A number of scenarios were tested to establish the economic viability of the total programme in the event of adverse factors. Sensitivity analysis shows that this base rate is slightly more sensitive to benefits delays, than to cost increases or benefits shortfalls of the same magnitude occurring over the same period. The results of the sensitivity analysis are presented in the Table below.

Sensitivity analysis

The base EIRR	25%
Total costs (+20%)	21%
Total benefits (-20%)	21%
Total benefits (2-years dela	18%

Financial and economic prices (YER)

	Unit	Financial	Economic
Outputs			
Crop Production			
Wheat grain	kg	173	155
Straw (dry, grazed on-field)	kg	2	2
Sorghum grain	kg	134	81
Thinned fresh sorghum stalks	sack	767	460
Sorghum stovers	bundle	38	23
Potatoes	kg	211	190
Legume	kg	460	414
Legume straw ((dry, grazed on-field)	kg	4	3
Coffee with husks, dried	kg	959	988
Tomato	kg	173	155
Output: Livestock			
Cow Milk	lt	153	138
Culled Cow (200tk/kg)	head	115,076	103,568
Male Calf 12 months	head	95,897	108,363
Small ruminants (mature animals)	head	19,179	21,673
Small ruminants (young animals)	head	13,426	15,171
Manure (cow dung)	kg	19	17
Inputs			
Seed			
Sorghum seeds	kg	134	121
Legume seeds	kg	460	414
Wheat seeds	kg	173	155
Potatoes seeds	kg	288	259
Tomato seedlings	unit	2	1
Coffee seedlings	unit	192	173
Labour		-	-
Oxen hire (ploughing)	day	2,877	2,589
Oxen hire (cultivating)	day	2,877	2,589
Supplementary irrigation water	hour	1,151	1,036
Tractor hire (ploughing)	day	2,877	2,589
Tractor hire (harvesting)	day	2,877	2,589
Unskilled agricultural labour	day	1,000	700
Potatoes storage fee	t/month	20,330	18,297
Fertilizers, Pesticdes, etc.			
Urea	50kg bag	6,137	7,794
TSP	50kg bag	9,590	8,631
Manure	25kg bag	479	432
Investment Costs: Livestock			
Cow in calf	head	191,793	172,614
Manual sorghum chopper	unit	1,918	1,726
Husbandry Costs (Annual): Livestock			
Straw	kg	2	1
Sorghim stover	kg	38	35
Wheat Bran	kg	38	35
Veterinary services	CU	1,918	1,726
Mineral blocks	unit	1,918	1,726
Breeding	l/s	1,151	1,036
Transport (to local market, 50km)	lot (15bags)	7,672	6,905

Financial analysis. Crop budgets

Wheat

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Production and Income						
Wheat grain	kg	173	1,300	224,398	1,690	291,717
Straw (dry, grazed on the field)	kg	2	1,000		1,300	
Total				**224,398**		**291,717**
Costs						
Seeds/seedlings	kg	173	120	20,714	120	20,714
Cultivation						
Oxen hire (ploughing /levelling)	day	2,877	11	31,646	11	31,646
Oxen hire (cultivation)	day	2,877	4	11,508	4	11,508
Supplementary irrigation water	hour	1,151			40	46,030
Labor (family)						
Field preparation	pers/day	1,000	12		12	
Sowing	pers/day	1,000	3		3	
Irrigation construction/management	pers/day	1,000			10	
Fertilizer application	pers/day	1,000	4		4	
Weeding and thinning	pers/day	1,000	17		17	
Harvesting and transport	pers/day	1,000	30		33	
Processing	pers/day	1,000	10		11	
Marketing	pers/day	1,000				
Labor (hired)	pers/day	1,000	12	12,000	12	12,000
Fertiliser						
Manure	25kg bags	479	25	11,987	25	11,987
Packing						
Bags/boxes	units					
Total	YER			**87,854**		**133,884**
Net benefits	YER			**136,544**		**157,833**
Incremental net benefits	YER				**21,289**	

Sorghum

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Production and Income						
Sorghum grain	kg	134	750	100,691	975	130,899
Sorghum stalks	sack	767	2		3	
Sorghum stover	bundle	38	2,400		3,120	
Total				**100,691**		**130,899**
Costs						
Seeds/seedlings	kg	134	35	4,699	35	4,699
Cultivation						
Oxen hire (ploughing /levelling)	day	2,877	6	17,261	6	17,261
Oxen hire (cultivation)	day	2,877	2	5,754	2	5,754
Supplementary irrigation water	hour	1,151			20	23,015
Labor (family)						
Field preparation	pers/day	1,000	12		12	
Sowing	pers/day	1,000	3		3	
Irrigation construction/management	pers/day	1,000			10	
Fertilizer application	pers/day	1,000	4		4	
Weeding and thinning	pers/day	1,000	17		17	
Harvesting and transport	pers/day	1,000	30		33	
Processing	pers/day	1,000	10		11	
Marketing	pers/day	1,000				
Labor (hired)	pers/day	1,000	6	6,000	6	6,000
Fertiliser						
Manure	25kg bags	479	13	6,233	13	6,233
Packing						
Bags/boxes	units					
Total	YER			**39,947**		**62,963**
Net benefits	YER			**60,744**		**67,936**
Incremental net benefits	YER				**7,192**	

Potatoes

Items	Unit	Unit cost	WOP Qty	WOP Costs and Income	WP Qty	WP Costs and Income
Production and Income						
Potatoes	kg	211	6,000	1,265,834	7,800	1,645,584
Total				**1,265,834**		**1,645,584**
Costs						
Seeds/seedlings	kg	211	70	14,768	70	14,768
Cultivation						
Tractor hire (ploughing /levelling)	day	2,877	20	57,538	20	57,538
Tractor hire (hatvesting)	day	2,877	10	28,769	15	43,153
Supplementary irrigation w ater	hour	1,151			150	172,614
Labor (family)						
Field preparation	pers/day	1,000	12		12	
planting	pers/day	1,000	6		6	
Irrigation construction/management	pers/day	1,000			15	
Fertilizer application	pers/day	1,000	6		6	
Weeding and thinning	pers/day	1,000	7		7	
Harvesting and transport	pers/day	1,000	40		45	
Processing	pers/day	1,000				
Marketing	pers/day	1,000	3		3	
Labor (hired)	pers/day	1,000	96	96,000	96	96,000
Fertiliser						
Manure	25kg bags	479	50	23,974	50	23,974
Urea	50kg bags	6,137	5	30,687	5	30,687
TSP	50kg bags	9,590	1	9,590	1	9,590
Packing						
Bags/boxes	units	25	120	3,000	156	3,900
Total	YER			**264,326**		**452,224**
Net benefits	YER			**1,001,509**		**1,193,361**
Incremental net benefits	YER				**191,852**	

Tomatoes

Items	Unit	Unit cost	WOP Qty	WOP Costs and Income	WP Qty	WP Costs and Income
Production and Income						
Tomatoes	kg	173	5,000	863,069	6,500	1,121,989
Total				**863,069**		**1,121,989**
Costs						
Seeds/seedlings	kg	173	70	12,083	70	12,083
Cultivation						
Tractor hire	day	2,877	20	57,538	20	57,538
Supplementary irrigation w ater	hour	2,877			40	115,076
Labor (family)						
Field preparation	pers/day	1,000	4		4	
Transplant	pers/day	1,000	20		20	
Irrigation construction/management	pers/day	1,000			10	
Fertilizer application	pers/day	1,000	6		6	
Weeding	pers/day	1,000	20		20	
Harvesting and transport	pers/day	1,000	20		30	
Processing	pers/day	1,000				
Marketing	pers/day	1,000	3		3	
Labor (hired)	pers/day	1,000	12	12,000	12	12,000
Fertiliser						
Manure	25kg bags	479	50	23,974	50	23,974
Urea	50kg bags	6,137	5	30,687	5	30,687
TSP	50kg bags	9,590	1	9,590	1	9,590
Packing						
Bags/boxes	units	25	500	12,500	650	16,250
Total	YER			**158,372**		**277,197**
Net benefits	YER			**704,697**		**844,792**
Incremental net benefits	YER				**140,095**	

Lentils

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Production and Income						
Dry lentils	kg	460	700	322,212	910	418,876
Legume straw (dry, grazed on the fiel	kg	4	3,000		3,300	
Total				**322,212**		**418,876**
Costs						
Seeds/seedlings	kg	460	70	32,221	70	32,221
Cultivation						
Oxen hire (ploughing /levelling)	day	2,877	12	34,523	12	34,523
Supplementary irrigation w ater	hour	1,151			40	46,030
Labor (family)						
Field preparation	pers/day	1,000	12		12	
Sow ing	pers/day	1,000	5		5	
Irrigation construction/management	pers/day	1,000			10	
Fertilizer application	pers/day	1,000	2		2	
Weeding and thinning	pers/day	1,000	20		20	
Harvesting and transport	pers/day	1,000	3		8	
Processing	pers/day	1,000	13		16	
Marketing	pers/day	1,000	3		4	
Labor (hired)	pers/day	1,000	0	0	0	0
Transport hire to local market	lot (15bags)	7,672	1	7,672	1	7,672
Fertiliser						
Manure	25kg bags	479	40	19,179	40	19,179
Packing						
Bags/boxes	units	25	20	500	26	650
Total	YER			**85,923**		**131,954**
Net benefits	YER			**236,289**		**286,922**
Incremental net benefits	YER				**50,633**	

Coffee (new plantation)

Items	Unit	PY1	PY2	PY3	PY4	PY5	PY6-20	PY7	PY8	PY9	PY10	PY11	PY12	PY13	PY14	PY15	PY16	PY17	PY18	PY19	PY20
Yields and Inputs																					
Coffee with husks, dried	kg			400	800	1,200	1,600	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Investment Inputs																					
Seedlings (900/ha+10% replacement)	unit	990																			
Fertilizer (manure)	kg	50																			
Labor (family)	pers/day	230																			
Labor (hired)	pers/day	70																			
Oxen hire (ploughing)	days	23																			
Operating Inputs																					
Oxen hire (inter row cultivation)	days		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Fertiliser (manure)	bags		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Labor (family)																					
Weeding and spraying	pers/hours		75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Fertilizer distribution	pers/hours		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Water application/summer	pers/hours		75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
Water application/winter	pers/hours		12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Harvesting and transport				23	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Coffee drying				7	14	14	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Marketing				3	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Labor (hired)			40	40	55	55	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77

Financial Budget (YER)	Unit	Unit cost	PY1	PY2	PY3	PY4	PY5	PY6-20	PY7	PY8	PY9	PY10	PY11	PY12	PY13	PY14	PY15	PY16	PY17	PY18	PY19	PY20
Sales revenue	kg	959	0	0	383,586	767,172	1,150,758	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931	1,917,931
Investment Costs																						
Seedlings (900/ha+10% replacement)	unit	192	189,875																			
Fertilizer (manure)	kg	479	23,974																			
Labor (family)	pers/day	1,000	230,000																			
Labor (hired)	pers/day	1,000	70,000																			
Oxen hire (ploughing)	days	2,877	66,169																			
Operating Costs																						
Oxen hire (inter row cultivation)	days	2,877		46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030	46,030
Fertiliser (manure)	bag	479		23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974	23,974
Labor (family)																						
Weeding and spraying	pers/day	1,000																				
Fertilizer distribution	pers/day	1,000																				
Water application/summer	pers/day	1,000																				
Water application/w inter	pers/day	1,000																				
Harvesting and transport	pers/day	1,000																				
Coffee drying	pers/day	1,000																				
Marketing	pers/day	1,000																				
Labor (hired)	pers/day	1,000		40,000	40,000	55,000	55,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000
Maintenance costs	lmps			5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800	5,800
Total costs			580,018	115,805	115,805	130,805	130,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805	152,805
Net benefits			-580,018	-115,805	267,781	636,368	1,019,954	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126
Incremental net benefits			-580,018	-115,805	267,781	636,368	1,019,954	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126	1,765,126

Financial budget

100 stables. Improved animal housing.

The herd projection was done within an aggregated model of 100 farms (owning 1 head of cattle and 6 small ruminants each).

Yields and inputs

Item	Unit	Price	Without project	With Project YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR 11	YR 12	YR 13	YR 14	YR 15	YR 16	YR 17	YR 18	YR 19	YR 20
Parameters and assumptions																							
Small ruminants (goats)																							
Flock composition at beginning of year																							
Mature animals (+15 months)																							
males	each		150	150	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165
females	each		150	150	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165
Young animals (0-15 months)	each																						
males	each		150	150	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
females	each		150	150	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
Sales including culls																							
Mature animals (+15 months)	each		20	20	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Young animals (0-15 months)	each		40	40	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Total sales	each		60	60	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
TOTAL FLOCK			600	600	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597
Lactation performance																							
Period	days		160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
Milk yield - daily average winter	liters		1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Milk yield - daily average summer	liters		2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Milk yield - total lactation	lt/head/Y		257	257	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
Total herd output	liters		36,551	36,551	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227	44,227
Weaning consumption	lt/day		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Weaning age	days		65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Weaning consumption - total herd	litres		19,500	19,500	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475	20,475
Cattle(dairy)																							
Herd composition at beginning of year																							
Bulls	each		10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Breeding cows	each		45	45	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Calves	each		26	26	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
Heifers	each		10	10	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Steers	each		9	9	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
TOTAL HERD	each		100	100	112	111	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110

Technical coefficients (percent)																						
Calving rate		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Calf mortality		10	10	10	10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Adult mortality		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Culling rate (males)		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Culling rate (heifers)		5	5	5	5	10	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Sales (including culls)																						
Culled males	each	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Culled heifers	each	0	0	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Lactation performance																						
Period	days	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Milk yield - daily average w inter	liters	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Milk yield - daily average summer	liters	8	8	9	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Milk yield - total lactation	lt/head/Y	1,463	1,463	1,609	1,770	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947
Total herd output	liters	62,543	62,543	75,677	83,245	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570	91,570
Calves consumption	lt/day	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Weaning age	days	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Calves consumption - total herd	lt	11,846	11,846	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029	12,029
Main Production																						
Milk for sale and self-consumption																						
Cattle	litres	50,697	50,697	63,649	71,217	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541	79,541
Small ruminants	litres	17,051	17,051	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752	23,752
Animal sales (including culls)																						
Cattle																						
males	each	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
heifers	each	0	0	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Small ruminants	each	60	60	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Manure - total herd	kg/year	143,063	143,063	159,291	158,175	157,237	157,237	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299	156,299
Operating costs																						
Small ruminants																						
Straw / hay a/	ton	55	55	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
Sorghum stover	ton	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
Cattle																						
Straw / hay a/	ton	55	55	61	61	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Sorghum stover	ton	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Mineral feeding	kg	301	301	335	333	331	331	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329
Veterinary and other costs	per year	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Breeding	cow	45	45	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Subtotal operating costs																						
Labour (family)																						
Milking	ers/days/year	960	960	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Subtotal labour		960	960	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026

Revenue

Item	Unit	Price	Without project	With Project																			
				YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR 11	YR 12	YR 13	YR 14	YR 15	YR 16	YR 17	YR 18	YR 19	YR 20
Main Production																							
Milk for sale and self-consumption																							
Cattle	litres	153	7,778,666	7,778,666	9,765,923	10,927,074	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340	12,204,340
Small ruminants	litres	130	2,216,663	2,216,663	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762	3,087,762
Animal sales (including culls)																							
Cattle																							
males	each	108,363	108,363	146,290	146,290	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949	213,949
heifers	each	115,076	0	51,784	57,538	75,734	151,469	151,469	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203	227,203
Small ruminants																							
Mature animals (+15 months)	each	19,179	383,586	383,586	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459	316,459
Young animals (0-15 months)	each	13,426	537,021	537,021	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904	422,904
Manure - total herd	kg	19																					
Subtotal Main Production			11,024,298	11,114,010	13,796,875	15,043,882	16,396,882	16,396,882	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616	16,472,616
Operating costs																							
Small ruminants																							
Straw	ton	2,000	54,750	54,750	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476	54,476
Sorghum stover	ton	38,359	1,050,067	1,050,067	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817	1,044,817
Cattle																							
Straw	ton	2,000	54,928	54,928	61,158	60,730	60,370	60,370	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009	60,009
Sorghum stover	ton	38,359	351,160	351,160	390,992	388,254	385,950	385,950	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646	383,646
Mineral feeding	unit	1,918		577,249	642,727	638,225	634,438	634,438	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652	630,652
Veterinary costs	per year	1,918		383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586
Breeding	cow	7,672	345,228	345,228	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750	379,750
Subtotal operating costs			1,856,132	2,816,968	2,957,508	2,949,838	2,943,387	2,943,387	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937
Labour (family)																							
Milking	ers/days/yea	1,000																					
Subtotal labour																							
Total costs			1,856,132	2,816,968	2,957,508	2,949,838	2,943,387	2,943,387	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937	2,936,937
Net benefits			9,168,166	8,297,042	10,839,368	12,094,044	13,453,495	13,453,495	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680	13,535,680
Returns to family labour			9,550	8,643	10,565	11,788	13,113	13,113	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193	13,193
Incremental net benefit				-871,124	1,671,202	2,925,878	4,285,329	4,285,329	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514	4,367,514
Incremental net benefit per stable				-8,711	16,712	29,259	42,853	42,853	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675	43,675

Economic analysis

Integrated watershed development scheme model

Integrated watershed development scheme model			
Technical Characteristics and Assumptions, Benefits and Costs			
a) Water management			
Capacity (1) :	60,000	m3	
(1) The annual flow of the reservoiir is assumed to be 1.5 times the storage capacity in an average climatic year.			
Water availability (1)	90,000	m3	
Water use, m3	agriculture	animal watering	
	10,000	80,000	
Agriculture			
Command area of scheme irrgation	16	ha	
No of households benefiting	32		
No of beneficiaries	198		
Animal watering			
Animal water use per hhd	30	m3/year	
No of households benefiting	333		
No of beneficiaries	2,065		
b) Land management (introduction of high value crops)			
Rehabilitated area per scheme	10	ha	
c) Drinking water facilities: value of time saved per cistern			
1 tank/cistern build per scheme; benefits in time saved for women fetching water			
Capacity: 5,000 m3 / 5000000 liters			
Family needs: 90 liters (6 persons x 15 liters)			
Length of time: 3 months (or 90 days)			
5000,000 / 90 / 90 = 617 family/days			
Labor time saved daily: 1 hours (2 hours of water collection halved)			
Hourly value of unskilled labor: YER 1000 per day /10 hrs = 100 YER:			
(YER) (shadow pricing)			70%
Economic value of unskilled labor			70
Economic value of time saved daily			70
Economic value of time saved over 90 days			6,300
Economic value of time saved per tank			**957,600**
Investment Cost	286,140	US$	
(total investment cost per ha)	*1,335*	*US$/ha*	
Maintenance Cost (% of CW)	2	%	
Annual Maintenance Cost	-	US$	
N.B.: Integrated watershed development scheme comprises: (i) water harvesting infrastructure for crop irrigation and animal watering, (ii) land management and (iii) drinking water facilities			
Sources: Dhamar Participatory Rural and Economic Oppirtunities Projects (technical assumptions), RGP COSTAB (investment costs)			

Economic Analysis (3)	**PY1**	**PY2**	**PY3**	**PY4**	**PY5**	**PY6**	**PY7**	**PY8**	**PY9**	**PY10-20**
Investment Cost (scheme)	61,233,960									
Maintenance Cost		-	-	-	-	-	-	-	-	-
Benefits										
Crop irrigation		912,508	1,303,583	1,303,583	1,303,583	1,303,583	1,303,583	1,303,583	1,303,583	1,303,583
Animal watering		3,040,635	4,560,952.27	6,081,270	10,642,222	15,203,174	15,203,174	15,203,174	15,203,174	15,203,174
Land rehabilitation (high value crops)	-	4,620,161	- 2,149,216	1,570,721	5,311,658	9,262,595	16,961,469	16,961,469	16,961,469	16,961,469
Drinking water (value of time saved)		957,600	957,600	957,600	957,600	957,600	957,600	957,600	957,600	957,600
		290,582	4,672,919	9,913,174	18,215,063	26,726,952	34,425,826	34,425,826	34,425,826	34,425,826
Cash flow	- 61,233,960	290,582	4,672,919	9,913,174	18,215,063	26,726,952	34,425,826	34,425,826	34,425,826	34,425,826

EIRR	27%	Net Present Value (10% discount rate)	124,404,384	YER	

(1) This is the model of a typical scheme with irrigation capacity of 90,000m3 serving an area of 16 ha which would improve irrigation on existing irrigated land with poor water supply, rehabilitate 10h of agricultural land and improve access to drinking water within watershed

(2) See Detailed Cost tables for details.
(3) Undertaken over a 20-year period

Road model

Rehabilitation of a Village Road (5.0 km) connecting a village (potatoes producers) with the main roa

Technical Characteristics and Assumptions, Benefits and Costs

Investment cost (YER)	38520000
Maintenance costs (1%)	385200

Current production area: 146ha
(5km*117hhd/km*0.25 ha under potatoes

Description: the road connects one village with the main road

Main anticipated benefits:
1) increased production area (x2)
2) Increased harvest due to improved access to inputs (+10%)
3) Time spent on average journey -80%
4)Time savings for the population served by the road (opportunity cost computed as unskilled labour)

Average hhd per km	117		
Average hhd per road (5km)	583	0.20	
Parameters	**Unit**	**WOP**	**WP**
Average hhd per km	no	117	117
Average hhd per road (5km)	no	583	583
Opportunity cost of unskilled labour per day	YER	700	700
Average journey	km	5	5
Time spent on average journey	hours	3.33	1.67
Annual trips per household/year	no	26	39
Total Travel time	days	4,213	3,160
Total opportunity cost of labour	YER	2,949,074	2,211,806
Net saving in labour	YER		737,269
Area cropped under potatoes	ha	146	158
Annual volume of potatoes collected	tons	408	441
Annual volume of potatoes traded	tons	143	221
Net income from traded potatoes	YER	27,136,320	41,867,465
Net incremental income from traded potatoes			14,731,145

Item	**YR1**	**YR2**	**YR3**	**YR4-20**
Benefits				
Net saving in labour		368634.2593	737,269	737,269
Net income from trade		5892458.107	10311801.69	14,731,145
TOTAL benefits		6,261,092	11,049,070	15,468,414
Costs				
Investment Costs				
Road rehabilitation	38,520,000			
Recurrent costs				
Operation and maintenance /a		770,400	770,400	770,400
TOTAL costs	38,520,000	770,400	770,400	770,400
Net Benefit	-38,520,000	5,490,692	10,278,670	14,698,014
EIRR	30%			
Net Present Value (10% discount rate)	65,822,790			

Incremental economic programme costs (YER)

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11-20
Investment Costs											
A. Al Dhala	422,978,850	1,107,421,650	1,162,081,350	729,905,400	42,108,750	2,250,000	5,625,000				
B. Dhamar	415,238,850	1,009,361,250	1,057,046,850	620,398,800	43,233,750	2,250,000	5,625,000				
C. Hodeida	193,005,000	536,800,500	1,192,997,250	1,418,175,000	1,033,521,750	234,839,250	5,625,000				
D. Lahej	211,905,000	597,375,000	1,312,409,250	1,536,040,125	1,047,373,875	342,670,500	6,750,000				
E. Taiz	328,230,000	639,234,900	1,273,736,250	1,326,913,875	961,065,225	177,176,250	67,977,000				
F. PCU	45,000,000	73,125,000	186,750,000	7,875,000	14,625,000	7,875,000	12,375,000				
Total Investment Costs	**1,616,357,700**	**3,963,318,300**	**6,185,020,950**	**5,639,308,200**	**3,141,928,350**	**767,061,000**	**103,977,000**				
Recurrent Costs	**344,182,500**	**374,962,500**	**374,962,500**	**365,242,500**	**357,466,500**	**247,801,500**	**247,801,500**	**247,801,500**	**247,801,500**	**247,801,500**	**247,801,500**
Replacement costs						**35100000**				**103275000**	
Total costs	**1,960,540,200**	**4,338,280,800**	**6,559,983,450**	**6,004,550,700**	**3,499,394,850**	**1,049,962,500**	**351,778,500**	**247,801,500**	**247,801,500**	**351,076,500**	**247,801,500**

Programme incremental net economic benefits (YER)

29. This working paper presents the financial and economic analysis of the Rural Growth Programme (mentioned hereafter as RGP). **Financial analysis** aims at demonstrating that income-generating activities on farm (related to the main commodities supported by the project) as proposed in the RGP, are profitable and therefore sustainable. **Economic analysis** aims at demonstrating that, from an economic perspective, the programme as a whole is viable, taking into account, as much as possible, all quantifiable and additional costs and benefits in situations with and without programme.

30. The Programme design process has been unusual due to the security conditions prevailing in Yemen. Yemen is currently in phases 3 to 5 (moderate to high) depending on the location, with Sana'a in phase 4 (substantial). Given some limitations in organization of field missions, the programme design as well as financial and economic analysis have been carried as follows: (i) in-country: field missions (surveys, studies, modular design proposals) by local consultants supported by the ICO and PMUs; (ii) in Rome: data consolidation and production of the design documents, led by the CPM and supported by the CPMT; (iii) in the field, with 2 design missions, in December 2012 and in July 2013, fielded by IFAD with the objective of finalizing the documents and have them validated by PMUs and endorsed by the Government.

31. The Programme has 4 components: (i) community empowerment; (ii) natural resource management and infrastructure; (iii) crop and livestock promotion and (iv) project management. The Programme is scaling up successful activities and operations carried out in 3 ongoing projects in Dhamar and Al Dhala governorates to reach additional communities, and then expand to Hodeida, Lahej and Taiz.

32. The working paper is structured as follows: (i) data sources and general assumptions; (ii) summary of the project benefits; (iii) financial analysis; (iv) economic analysis; (v) sensitivity analysis; and (vi) adaptation of the water sector to the climate change.

Data Sources and General Assumptions

33. **Sources.** The data used in this analysis have been collected from various sources, including the Ministry of Agriculture and Irrigation, the existing PMU in Dhamar, as well as from potential partners (European Union, Islamic Development Bank[1], Ministry of Finance, and Fisheries Production Promotion Fund) operating in Yemen, local agricultural practitioners and missions' estimates. Additional data were collected from the three on-going IFAD-financed projects: the Dhamar Participatory Rural Development Project (DPRDP); the Community-Based Rural Infrastructure Project (CBRIP), and the Al-Dhala Community Resource Management Project (ADCRMP), as well as during field design missions in December 2012-January 2013 and July 2013.

[1] The Islamic Development Bank conducted a design mission from January 8th to 15th. An agreement for a co-financing of the Rural Growth Programme has been reached. A final design mission would be launched in April 2013 and a Board decision is expected for June 2013.

34. **Currency and exchange rate**. On the subject of Yemeni national currency (Yemeni riyal [YER]), it should be noted that in the wake of the unrest that began in early 2011 the riyal came under severe downward pressure. In response, the Central Bank kept the official rate steady at YR 214 = USD$1.00. The same exchange rate has been used throughout the present analysis.

35. Prices. Input and output prices were collected during the field visit in July 2013 and expressed in constant terms. Standard conversion factors have been used in economic analysis to adjust the local content of costs assumed to be non-traded[1]. A distortion was perceived in the market prices with respect to border prices of sorghum grain, for which a conversion factor[2] of 0.6 was applied for the economic analysis. Shadow prices for rural labor were estimated at 50% of the prevailing market wage rate, while for skilled labor, the market rate was assumed to reflect its opportunity cost.

36. Crop and activity models. In the present case, crop models represent a complementary activity (additional) to the ongoing income-generating activities carried out by small farms. The models show the incremental revenues and costs generated by the new investments.

Summary of the Project Benefits

37. **Quantifiable benefits.** The main quantifiable benefits expected from the project would comprise following elements:

- increased agricultural (crop) production due to better access to inputs, more efficient irrigation system and provision of updated technical assistance by VALW staff;
- increased livestock production due to better provision of animal husbandry, animal feed and watering;
- increased irrigated area through development of irrigation structures and improved water resources management; these investments resulting in increased crops yields and ability to move into higher value crops (coffee, cash crop/vegetables) as well as increased fodder production supporting higher livestock production;
- arrested environmental degradation and restoration of abandoned land to productive use through the soil conservation activities (terrace rehabilitation) contributing to an increase in crop production;
- enhanced access to financial resources through Saving and Credit Associations (SCA) and microfinance institutions/banks, which would enable financing agricultural needs as well as implementation and development of income generating activities;
- improved access to drinking water involving less labour and collection time. Women and children (mainly girls) would benefit in the first place as they are the ones in charge of water collection which takes up to 3 hours a day and impacts negatively on girls' school attendance. Reduced workload would enable women to focus on more productive activities and/or to participate in training and capacity building activities while girls would have opportunity to continue attending school;
- improved access due to construction/rehabilitation of village roads. Economic benefits from improved village roads would be generated through lower transportation costs, reduced average travel time, improved access to agricultural inputs, and increased income due to market access. Social benefits would result in improved access to school and health facilities, incremental time available for women and girls for more productive or empowering activities, increased labour mobility, and improved information, knowledge and skills dissemination.

[1] Assumption used in the Economic Opportunity Programme by IFAD (January 2010)
[2] Assumptions used in the ICR of the Irrigation Improvement Project by the World Bank (June 2009).

38. **Non-quantified Benefits.** In addition, the project is expected to generate non-quantifiable benefits in terms of capacity building and empowerment of the poor communities (especially women and youth). In particular, the following benefits will be important:

- Implementation of Community Action Plans enabling communities to participate in the planning of their own development;
- Users' associations invested with the responsibility of operating and maintaining infrastructure such as water harvesting infrastructure, drinking water schemes, rehabilitated land and roads;
- Literacy, life-skills training as well as business management and technical trainings also contributing to community empowerment, particularly for women and youth;
- Institutional strengthening of the communities, coupled with training in irrigation practice and adoption of participatory approaches for local planning, resulting in more ownership and better control by these communities of the irrigation structures put into place for their benefit. It will also result in less social conflicts and better relations with the local authorities.

Financial Analysis

39. The objectives of the financial analysis are to: (i) assess the financial viability of the improved technologies and systems promoted by the project and (ii) evaluate the impact of the project's interventions on the cash flow and household incomes of the farmers involved.

40. To assess the financial viability of the improved technologies, a number of indicative activities, which will benefit from RGP, were identified during the project design process.

41. According to FAO/WFP Crop and Food Security Assessment Mission to Yemen[1], rural Yemen is largely dominated by agriculture and livestock rearing. Grains such as sorghum, wheat, millet, maize and barley account for 58% of the area planted while cash crops (17%), fruits and vegetables (12%), animal fodder (10%) and pulses (4%) accounting for the remainder. In cash crop dependent zones, food crops are often forfeited for high value crops such as coffee, cotton, sesame, qat and tobacco. In addition to agriculture, livestock ownership is an integral component to rural Yemeni livelihoods. In general, most households own livestock (goats, sheep, cattle, and camels) and rely on both the consumption of livestock products and livestock sales.

42. Agricultural products considered in the analysis are the most popular for the project area. Several illustrative crop and livestock budgets were prepared to illustrate the impact of the potential investments on agricultural production.

Agricultural /Crop budgets.

43. **Key assumptions**. The parameters (yields, assumptions on the yield increases) for the models are based on information collected from the experience of previous projects financed in the same project area. These crop budgets present detailed annual expenses, including seeds, inputs, land preparation and labour and estimate average yields in various production conditions, reflecting average performances in no irrigation or poor irrigation conditions (corresponding to the "without project conditions") and adequate irrigation conditions ("with project conditions").

44. For the purpose of the analysis several models have been prepared, including: wheat, sorghum (grain and fodder), tomatoes (open air and greenhouse), bananas, potatoes, coffee (new plantation), and lentil. The "without" project situation represents crops with insufficient irrigation or rainfed, the "with" project models illustrate impact of better irrigation on crop yields.

45. Summary of crop budgets, and underlying technical assumptions on which these models are based, are presented in the table below. These budgets indicate that yields are expected to increase by 30% for most irrigated crops and 20% for rainfed crops. Yields of the major crops are projected to increase under irrigated and rainfed conditions compared to the "without" project situation due to

[1] Special Report FAO/WFP Crop and Food Security Assessment Mission to Yemen, September 2009.

increased and more secured water availability, more balanced use of fertilizer and improved farming practices. For rainfed crops, these increases are lower than for irrigated crops because of more limited potential for productivity increases in dryland farming conditions. In addition to the on-farm irrigation systems, the project will provide training to farmers on crop water requirements, irrigation schedule calculations and establishment of WUAs. Detailed crop and livestock models are provided in the Appendix to this Working Paper.

46. **Increased cereal (wheat and sorghum) production.** Four illustrative crop models have been prepared: 1 model for wheat and 3 models for sorghum production (irrigated grain sorghum, irrigated fodder and rainfed fodder sorghum). Sorghum is one of the major staple crops grown in Yemen, both in dryland and in irrigated conditions, and used for its grain as well as for fodder to meet household needs and livestock feed requirements. The models show the impact of improved irrigation on sorghum yields. Incremental net benefit per hectare for these crops wary from 57,636 YER (269 US$) for rainfed sorghum fodder until 236,688 YER (1,106 US$) for irrigated sorghum grain while additional labor will represent about 6 days or 6,000 YER (mainly for on-farm irrigation system construction and management, and harvesting). The detailed model is presented in the Appendix.

47. **Cash crops/vegetables (tomato and potato).** Tomatoes and potatoes are popular and representative vegetable crops in the project area and have been chosen as proxy for cash crops/vegetable production. Vegetables crops are usually irrigated using traditional methods (stream flows). Production is mostly sold on the local market. It is expected that with improved irrigation availability of water and hence yields would increase by 30%. Incremental net benefit per hectare and per year for these crops is 273,750 YER (1,279 US$) for potatoes and 273,000 YER (1,276 US$) for tomatoes, while additional labor represent about 8 days or 8,000 YER (mainly for on-farm irrigation system construction and management, and harvesting). The detailed model is presented in the Appendix.

48. **Fruits (banana) production.** This model illustrates an impact of improved irrigation on an existing banana plantation. Traditional irrigation used for bananas is one of the reasons of production losses and fruits deterioration because of over flooding (over irrigation). Improved irrigation system would allow to optimise water use and increase fruit production (production after losses as indicated in the relevant model). Incremental net benefits per hectare at full development are 268,660 YER (1,255 US$) per year while additional labor related to production will be about 4 days or 4,000 YER (mostly related to installation and maintenance of the irrigation system and harvesting). The detailed model is presented in the Appendix.

49. **Legumes (lentil) production.** This model illustrates the impact of the adoption of better irrigation practices on the pulses yields. Lentil model have been used as proxy for legumes. Incremental net benefit is 39,000 YER per hectare and per year. It might be expected that during project implementation legumes would be inter-cropped with a cereal (sorghum) that would increase the net benefits per hectare of the model. However, for the purpose of this analysis a single cropped model has been conservatively presented. The detailed model is presented in the Appendix.

50. **Increased high value crops (coffee) production. Establishment of new plantation.** In the case of rehabilitation of abandoned terraces, it's been assumed that these areas would be put back into productive use through the establishment high value crops production. This model illustrates the financial impact for a farmer who decides to invest in the establishment of a small coffee plantation. Investment costs for inputs incurred during the first year include land preparation, seedlings and inputs. Benefits (all incremental, as this is a new activity) at full development are about 2,224,495 US$ per year and per hectare. The first production is harvested in the third year at 20% of the expected yield, with maturity in the seventh year after establishment. However, during the period between the investment and the realisation of the full yield, the farmer would experience a significant drop in cash income; although at the same time, the net worth of his farm would increase. It would be crucial for the farmer to be fully aware of this situation prior to the investment being made, so that adequate provisions can be made to cover the shortfall (from other farm or off-farm income, remittances, etc.). The detailed model is presented in the Appendix.

51. **Greenhouse.** This model presents the investments required for vegetable production under semi-permanent or plastic tunnel greenhouses (a unit of 0.05 hectares). The initial cost of equipment, including plastic tunnel and on-farm irrigation is 220,420 YER or 1,030 US$ (80% project and 20% beneficiaries). It is assumed, as is prevailing common practice, that the necessary labour for assembling the greenhouse will be provided by the farmer. At full development, the incremental net benefit per tunnel (0.05 hectares) per year is 15,469 YER (72 US$) and given the family labor requirements, the return to family labour will be equivalent to about 5,335 YER (24 US$) per day at full development. However, after the initial investment (first year of the project) the farmer will need to face a significant drop in cash income. That's why it's been assumed that this activity is not a new activity but is undertaken by an existing vegetable producing farmer that would like to upgrade its production methods. The detailed model is presented in the Appendix.

52. **Increased livestock production.** The model illustrates the likely returns over time to smallholders participating in this project and having better access to irrigation infrastructure and animal watering. The model is an aggregation of 100 small stables (owning 1 head of cattle and 14 small ruminants each) because projecting the herd composition on a small farm when larger animals introduces the problems of divisibility. Technical coefficients such as mortality or calving rates, applied to small farms, lead to "fractional animals". Low animal productivity and profitability of livestock production is mainly due to inappropriate livestock feeding practices and limited availability of clean drinking water. The main challenge smallholder farmers are facing in the project area is to optimize the benefits of mixed farming (crop and livestock production together) by using productivity enhancing technologies. It was conservatively estimated that the meat and milk production could increase by a minimum of 10% over time following substantially better water supply and from adoption of improved feeding regime. The model shows incremental net benefit (with the project, i.e. at full development (Y 4) of 12,298 YER (58 US$) per family and per year. Incremental net benefit is derived from the production of additional milk and meat.

53. Off-take of livestock is maintained to provide some cash income from sales while sustaining a constant number of animals over the period covered by the model. This strategy is in line with the need to maintain livestock numbers in balance with the feed resources available. The model is presented in the Appendix.

54. **Beekeeping and honey production as Income Generating Activity (IGA).** Farmers engaged in subsistence production on small areas and given that they have on average only one cow and few small ruminants, they need to diversify their sources of income. Given the difficult terrain (limited agricultural land, terraces in Western mountainous districts, etc.) farmers need to grow a high value, low volume crops or initiate some off-farm IGAs. The Programme will provide willing farmers with matching grants opportunities (about 250$ per beneficiary) in order to start an IGA. From experience of the previous projects, the main opportunities identified by farmers as IGAs are coffee production, bee-keeping, sheep fattening or, of farm, garment production and carpentry. With the high premium price paid for local honey, bee-keeping is an attractive IGA. Beekeeping model illustrate the establishment of a new bee hives. Investment cost (50% paid by beneficiary) will include bee-hives and colony, queen screen as well as some basic equipment (face nets, smoker, brush and feeding equipment). Honey production would increase from the initial level of 5kg per year to 20 kg per year, resulting in a short pay-back period for the investment cost. Financial viability : net benefit + by family labor day The model is presented in the Appendix.

Economic analysis

55. **Cost Stream.** In order to estimate the project's economic viability, in the form of the Economic Internal Rate of Return (EIRR), the cash flow calculated includes the project base costs (as extracted from the COSTAB tables shown in the Appendix) with their physical contingencies but without taxes and price contingencies (therefore in constant YER). The costs include all investments for all project components as well as their replacement (for transportation, office and computer equipment/materials, etc.) and recurrent costs (mainly operation and maintenance for transportation, equipment and materials). The Cost stream calculation is presented in the Appendix.

56. **Benefit Stream.** The analysis attempts to identify quantifiable benefits related to the activities undertaken following the implementation of the components of the project. The incremental quantifiable benefit stream comprises following elements: (i) irrigation development, with large and small water harvesting structures and spate irrigation; (ii) improved and facilitated access to drinking water; (iii) terraces rehabilitation and productive use of rehabilitated land; (iv) benefits from agricultural roads construction; (v) rangelands rehabilitation; (vi) greenhouses; (vii) IGAs.

57. The illustrative crop models prepared for the purpose of the financial analysis and described above have been used for the calculation of the overall benefit stream. In addition to that, for the economic analysis separate models have been developed to illustrate the benefits from irrigation, drinking water and roads infrastructure development.

58. Given the great variety of agricultural systems, according to the geography and climate that characterize different agro-ecological zones, different models were prepared for each investment in irrigation to illustrate different cropping patterns. The Programme area could be divided in four characteristic agro-ecological zones: (i) Western coastal zone (Hodeida); (ii) Southern coastal zone/southern highland (Lahej); (iii) Central highland (Al Dhala and Dhamar); (iv) Southern Highland (Taiz). Hence, for each investment in irrigation (having an impact on agricultural production), several models were prepared according to the cropping pattern dominant within each agro-ecological zone.

59. **Irrigation development model. Construction of water harvesting structures.** The cisterns will improve the access of rural households to irrigation water. There are two types of water harvesting structures: large and small. Each water harvesting structure has a capacity of 50,000 m^3 for large structures and 20,000 m^3 for small structures. Water harvesting structures are meant to provide water principally for agriculture but also some for animal consumption. It is assumed that 80% of this water is for agriculture and the remaining 20% for livestock. There would therefore be water available to irrigate about 16 ha of agriculture land for each large structure and 7 ha for each small structure, enough to provide daily water to 244 family livestock units (3,660 heads) with one large water harvesting structure and daily water to 98 units (1,470 heads) with one small structure. It is conservatively estimated that the unit's meat and milk production could increase by 10% over time following substantially better water supply. Model shows the estimated value of this increase per structure.

60. **Spate irrigation.** A separate model has been developed to illustrate the impact of construction of spate irrigation structures. Spate irrigation is based on traditional Yemeni irrigation techniques when floodwater is diverted from its river bed and channelled to basins where it is used for irrigation and, when possible, to feed water ponds for animal watering. Given unpredictable character of spate irrigation, this type of irrigation is essentially used for drought resistant crops, mainly sorghum. The Programme will finance small schemes with a command area of about 25 hectares, usually located on tributary wadis in mountain areas, or in plain supplied by small wadis. It’s been assumed that “without” project, sorghum is a rainfed crop, hence with improved irrigation sorghum yields could increase by 20%. With regard to animal watering, when water flow is sufficient this could allow to feed water ponds (200m3) for livestock. Given uncertainty in spate floods calculation, livestock water use wasn't included in benefits calculation. In view of the small size of the structures, construction would take one year and benefits could start materializing during the second year. Maintenance cost are assumed to remain constant, starting in Year 2. In doing this, agricultural benefits have been projected to progressively increase to reach full benefits in Year 7 after the initial construction of the infrastructure. All replacement and maintenance costs consist of unskilled labor that the beneficiaries can provide over the year. The sustainability of the reservoirs is therefore quite likely. The model is presented in the Appendix.

61. **Drinking water. Construction of individual roof water harvesting cisterns.** The cisterns will improve the access of rural households to potable water. This will reduce drudgery and the travel distance to fetch water, particularly for women, consequently providing them with additional time that could be used for household or animal husbandry activities. Each cistern has a capacity of 10,5 m^3 which is equivalent to 10,500 liters of potable water. Assuming that an average family of seven persons needs 105 liters of water per day, this cistern would then supply one family per 150 days (5

months). It is understood that a family wife can take up to four hours to fetch water for drinking and the objective is to reduce this time at least by half. One hour saved per day can then be valued using the actual hourly wage of unskilled labor (63 YER), after shadow pricing to take into account the estimated underemployment in rural areas. Model presented in the annex shows the calculations.

62. For each cistern, the total economic value of the time saved would be equal to YER 9,375 for five months. These savings do not include the benefits related to reductions in water-borne diseases due to better quality water and therefore the improvements in the health conditions of the beneficiaries. The sustainability of the cistern and its benefits can be evaluated as follows. The model shows that the replacement costs (unskilled labor) would be around 535 YER each 2 years. The economic value of the time saved over a two-year period means that the beneficiaries can easily afford the replacement if they use the time saved to take up some income-generating and/or expense-saving activities (promoted by the project or otherwise). Moreover, the remaining part of the replacement costs as well as the annual maintenance of the cistern consist of unskilled labor that the beneficiaries can provide over the year.

63. **Construction of boreholes.** The boreholes are meant to provide water principally for human consumption. Each borehole has a debit of 36 m^3 of water per day. Similarly to the roof water harvesting cisterns, water availability within household's reach will reduce drudgery and the travel distance to fetch water hence benefits from this investment will be mainly in terms of time saved. Assumptions on water requirements per household as well as on the economic value of unskilled labor are the same as for the roof water harvesting model. However, borehole is not an individual investment and will benefit to about 343 households.

64. For each borehole, the total economic value of the time saved would be equal to YER 7,714,286 per year (36,048 US$). As in the case of the individual cisterns, these savings do not include the benefits related to the improvements in the health conditions of the beneficiaries. The sustainability of the borehole and its benefits can be evaluated as follows. The model shows that the maintenance costs (mainly of the water tank) would be about 134,820 YER or about 630 US$ per year, and replacement costs of the pump and water supply pipelines would be around 3,852,000 YER (18,000 US$), every 7 years. The economic value of the time saved over a seven-year period means that the beneficiaries can easily afford the replacement if they use the time saved to take up some income-generating and/or expense-saving activities (promoted by the project or otherwise). Moreover, the remaining part of the replacement costs as well as the annual maintenance of the cistern consist of unskilled labor that the beneficiaries can provide over the year. The model presented in the annex shows the calculations.

65. **Rural road model.** Incremental benefits were computed for agricultural roads following the method valuing the increase in transported goods and savings in travel time. The construction costs, as well as routine and periodic maintenance costs of the roads, are estimated on the basis of information given by the engineers involved. Time savings for the population served by the road (valued at the opportunity cost of unskilled labour) was estimated following field interviews. The model illustrates the incremental benefits from construction of a rural road of 5 km. It is assumed that the beneficiaries within the road catchment area are composed of about 117 households per km of road. The benefits would be derived from the increased volume of transported cash crops (potatoes have been used as proxy) for sale, plus the reduced travel time. The volumes of transported products for selected beneficiaries are those reported in the crop budgets presented in earlier sections. Annual costs for road O&M are assumed to be two percent of the investment costs starting after the investment. The model is presented in the Appendix.

66. **Rangeland rehabilitation.** These areas are meant to provide richer and more secure pastures for the livestock, particularly in times of droughts. Each rangeland unit spreads over 2 ha and would be closed off for resting during a period of about a year, then reopened for controlled grazing. Each area would have a water reservoir for livestock with a capacity of about 200 m^3 which would be sufficient for 14 family livestock units or 206 animals. Rangeland is opened to pasture and used during the dry season. It is assumed that 40% of the small ruminants are females, their milk production is estimated

at 342 litres over the year at 200 YER/liter. Cows constitute 40% of the herd, their milk production is 798 liters at 135 YER/liter. Assuming further that the meat and milk production could increase by 5% over time following better feeding and water available, the value of the additional meat and milk production would then be an estimated 283,487 YER (1,325 US$) per year. Model also shows that the annual maintenance of the set-aside area consists essentially of unskilled labor which the beneficiaries can provide over the year. There are practically no replacement costs involved.

67. **Project Estimated Return.** The base case Economic Internal Rate of Return (EIRR) is estimated at 15%. It has to be noted that the base EIRR includes the costs of all investments for all project components as well as their replacement and recurrent costs; on the benefits side, it includes exclusively the benefits quantified previously. The base case net present value of the project's net benefit stream, discounted at 10%, is YER 10.8 billion. The summary of the economic analysis is presented in the Appendix.

68. **Sensitivity analysis**. Sensitivity analysis assessed the effect of variations in benefits and costs and for various lags in the realisation of benefits. A number of scenarios were tested to establish the economic viability of the total project in the event of adverse factors. Sensitivity analysis shows that this base rate is slightly more sensitive to benefits delays, than to cost overruns or benefits shortfalls of the same magnitude occurring over the same period. The results of the sensitivity analysis are presented in the Table below.

Sensitivity analysis

The base EIRR	15%
20% costs overrun	13%
20% benefits shortfall	12%
Benefits delayed (2-years delay)	11%

Financial and economic prices (YER)

	Unit	Financial	Economic
Outputs			
Crop Production			
Wheat grain	kg	150	135
Straw (dry, grazed on-field)	kg	5	4.5
Sorghum grain	kg	250	150
Clitoria	kg	200	120
Thinned fresh sorghum stalks	sack	700	420
Sorghum stovers	bundle	38	23
Potatoes	kg	150	135
Lentils	kg	220	198
Legume straw (dry, grazed on-field)	kg	4	3
Coffee with husks, dried	kg	950	979
Tomato	kg	300	270
Banane	kg	100	90
Output: Livestock			
Cow Milk	lt	150	135
Culled Cow (200tk/kg)	head	20,000	18,000
Male Calf 12 months	head	25,000	28,250
Small ruminants	head	7,000	7,910
Manure (cow dung)	kg	19	17
Inputs			
Seed			
Sorghum seeds	kg	250	225
Legume seeds	kg	450	405
Wheat seeds	kg	200	180
Potatoes seeds	kg	288	259
Tomato seedlings	unit	5	5
Banana seedlings	unit	100	90
Coffee seedlings	unit	192	173
Labour			
Tractor hire (ploughing)	hour	3,000	2,700
Raising bunds/bassins/furrows	hour	3,000	2,700
Opening irrigation channels	hour	3,000	2,700
Machine harvesting (cutting and bailing)	hour	3,000	2,700
Unskilled agricultural labour	day	1,000	500
Potatoes storage fee	t/month	20,330	18,297
Fertilizers, Pesticdes, etc.			
Urea	50kg bag	6,100	7,747
TSP	50kg bag	9,500	8,550
Manure	25kg bag	500	450
Investment Costs: Livestock			
Cow in calf	head	191,793	172,614
Manual sorghum chopper	unit	1,918	1,726
Husbandry Costs (Annual): Livestock			
Straw	kg	2	1
Sorghim stover	kg	38	35
Wheat Bran	kg	38	35
Veterinary services	CU	1,918	1,726
Mineral blocks	unit	1,918	1,726
Breeding	l/s	1,151	1,036
Transport (to local market, 50km)			
Transport by track	truck	5,000	4,500
Transport by sacks	sack	100	90
Packaging			
Sacks	50kg	150	135

Financial analysis. Crop budgets.

Wheat (1ha)

Items	Unit	Unit cost	WOP Qty	WOP Costs and Income	WP Qty	WP Costs and Income
Main Production						
Wheat grain	kg	150	1,800	270,000	2,430	364,500
By product						
Straw (dry, grazed on the field)	kg	5	1,500	7,500	2,025	10,125
Gross value of production				**277,500**		**374,625**
Production costs						
Seeds	kg	150	120	18,000	120	18,000
Cultivation						
Tractor hire (ploughing /levelling)	day	3,000	11	33,000	11	33,000
Tractor hire (cultivation)	day	3,000	4	12,000	4	12,000
Labor (family)						
Field preparation	pers/day	1,000	12		12	
Sowing	pers/day	1,000	3		3	
Irrigation construction/management	pers/day	1,000			3	
Fertilizer application	pers/day	1,000	1		1	
Weeding and thinning	pers/day	1,000	17		17	
Harvesting and transport	pers/day	1,000	30		32	
Processing	pers/day	1,000	10		11	
Total family labor			73		79	
Labor (hired)	pers/day	1,000	6	6,000	6	6,000
Fertiliser						
Manure	25kg bags	500	15	7,500	15	7,500
Packing						
Bags/boxes	units	150	36	5,400	49	7,290
Transport	per bag	100	36	3,600	49	4,860
Tax (zakat/jizya) 5 %				13,875		18,731
Total costs	YER			**99,375**		**107,381**
Net benefits	YER			**178,125**		**267,244**
Incremental net benefits	YER				**89,119**	

Sorghum grain (irrigated), 1 ha

Items	Unit	Unit cost	WOP Qty	WOP Costs and Income	WP Qty	WP Costs and Income
Main production						
Sorghum grain	kg	250	2,500	625,000	3,375	843,750
By product						
Sorghum stalks	sack	700	250	175,000	300	210,000
Gross value of production				**800,000**		**1,053,750**
Production costs						
Seeds/seedlings	kg	250	6	1,500	6	1,500
Cultivation						
Tractor hire (ploughing/levelling)	hour	3,000	5	15,000	5	15,000
Tractor hire (raising basins/furrows/irrigation channels)	hour	3,000	3	9,000	3	9,000
Labor (family)						
Planting	pers/day	1,000	5		5	
Weeding	pers/day	1,000	5		5	
Irrigation construction/management	pers/day	1,000			3	
Fertilizer application	pers/day	1,000	1		1	
Harvesting (cutting and bailing) and transport	pers/day	1,000	8		9	
Processing	pers/day	1,000	8		9	
Total family labor	pers/day		27		32	
Labor (hired)	pers/day	1,000	6	6,000	6	6,000
Fertiliser						
Manure	25kg bags	500	20	10,000	20	10,000
Packaging material						
Bags/boxes	units	150	50	7,500	68	10,125
Transport	per bag	100	50	5,000	68	6,750
Tax (zakat/jizya) 5 %				40,000		52,688
Total costs	YER			**94,000**		**111,063**
Net benefits	YER			**706,000**		**942,688**
Incremental net benefits	YER				**236,688**	

Sorghum fodder (irrigated), 1 ha

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Fodder production						
Fodder	tons		10		13.5	
Animal feed requirements (1)	animal units		19		25	
Increase in animal birth rate (2)	animal units		11		15	
Increase in anumal heard (3)	animal units		30		41	
Female	animal units		15		20	
Male	animal units		15		20	
Milk production (4)	liter		11,661		15,753	
Animal heads	no		1		2	
Sales						
Milk	YER	150		524,748		708,871
Heads	YER	25,000		28,250		56,500
Gross value of animal production	YER			552,998		765,371
Production costs						
Seeds	kg	250	6	1,500	6	1,500
Cultivation						
Tractor hire (ploughing/levelling)	hour	3,000	5	15,000	5	15,000
Tractor hire (raising basins/furrow s/irrigation channels)	hour	3,000	3	9,000	3	9,000
Labor /fodder production (family)						
Planting	pers/day	1,000	5		5	
Weeding	pers/day	1,000	6		6	
Irrigation construction/management	pers/day	1,000			3	
Fertilizer application	pers/day	1,000	1		1	
Harvesting (cutting and bailing)	pers/day	1,000	15		15	
Labor/fodder production (hired)	pers/day	1,000	8	8,000	8	8,000
Livestock operating costs						
Labor (family)	pers/day	1,000	41		55	
Other (5)	per animal	10,305		309,933		418,409
Fertiliser						
Manure	25kg bags	500	20		20	
Transport	l/s			3,000		3,000
Tax (zakat/jizya) 5 %				27,650		38,269
Total	YER			**374,083**		**493,178**
Net benefits	YER			**178,916**		**272,193**
Incremental net benefits	YER				**93,278**	

(1) Animal carrying capacity @ 1.5kg/day/headx360 days= 532 kg
(2) Increase in animal brith @ 60 % before and 80 % after
(3) Females @ 50 % of total herd
(4) Assumptions:260days lactation period; 3l/day in dry season, 5l/day in rainy season; calves'consumption 1l/day; weaning ag
(5) Including mineral feeding, veterinary services, breeding

Sorghum fodder (rainfeed), 1 ha

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Fodder production						
Fodder	tons		9		11	
Animal feed requirements (1)	animal units		17		20	
Increase in animal birth rate (2)	animal units		10		12	
Increase in anumal heard (3)	animal units		27		32	
Female	animal units		14		16	
Male	animal units		14		16	
Milk production (4)	liter		10,488		12,586	
Animal heads	no		1		2	
Sales						
Milk	YER	150		471,966		566,360
Heads	YER	25,000		25,000		50,000
Gross value of animal production	YER			496,966		616,360
Production costs						
Seeds/seedlings	kg	1,000	6	6,000	6	6,000
Cultivation						
Tractor hire (ploughing/levelling)	hour	1,000	5	5,000	5	5,000
Tractor hire (raising basins/furrow s/irrigation channels)	hour	1,000	3	3,000	3	3,000
Labor /fodder production (family)						
Planting	pers/day	1,000	5		5	
Weeding	pers/day	1,000	6		6	
Irrigation construction/management	pers/day	1,000			3	
Fertilizer application	pers/day	1,000	1		1	
Harvesting (cutting and bailing)	pers/day	1,000	15		15	
Labor/fodder production (hired)	pers/day	1,000	8	8,000	8	8,000
Livestock operating costs						
Labor (family)	pers/day	1,000	37		44	
Other (5)	per animal	10,305		278,939		334,727
Fertiliser						
Manure	25kg bags	500	20		20	
Transport	l/s			3,000		3,000
Tax (zakat/jizya) 5 %				24,848		30,818
Total costs	YER			**328,788**		**390,545**
Net benefits	YER			**168,179**		**225,814**
Incremental net benefits	YER				**57,636**	

(1) Animal carrying capacity @ 1.5kg/day/headx360 days= 532 kg
(2) Increase in animal brith @ 60 % before and 80 % after
(3) Females @ 50 % of total herd
(4) Assumptions:260days lactation period; 3l/day in dry season, 5l/day in rainy season; calves'consumption 1l/day; weaning ag
(5) Including mineral feeding, veterinary services, breeding

Potatoes (1 ha)

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Main production						
Potatoes	kg	150	6,000	900,000	8,100	1,215,000
Gross value of production				**900,000**		**1,215,000**
Production costs						
Seeds/seedlings	kg	150	70	10,500	70	10,500
Cultivation						
Tractor hire (ploughing /levelling)	hours	3,000	20	60,000	20	60,000
Tractor hire (harvesting)	hours	3,000	10	30,000	15	45,000
Labor (family)						
Field preparation	pers/day	1,000	12		12	
planting	pers/day	1,000	6		6	
Irrigation construction/management	pers/day	1,000			3	
Fertilizer application	pers/day	1,000	6		6	
Weeding and thinning	pers/day	1,000	7		7	
Harvesting and transport	pers/day	1,000	40		45	
Marketing	pers/day	1,000	3		3	
Labor (hired)	pers/day	1,000	20	20,000	20	20,000
Fertiliser						
Manure	25kg bags	500	50	25,000	50	25,000
Urea	50kg bags	6,100	5	30,500	5	30,500
TSP	50kg bags	9,500	1	9,500	1	9,500
Packaging material						
Bags/boxes	units	150	120	18,000	162	24,300
Transport		100	120	12,000	162	16,200
Tax (zakat/jizya) 5 %				45,000		60,750
Total costs	YER			**260,500**		**301,750**
Net benefits	YER			**639,500**		**913,250**
Incremental net benefits	YER				**273,750**	

Tomatoes (1ha)

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Production and Income						
Tomatoes	kg	300	3,000	900,000	4,050	1,215,000
Total				**900,000**		**1,215,000**
Costs						
Seeds/seedlings	unit	5	5,800	29,000	5,800	29,000
Cultivation						
Tractor hire	hours	3,000	6	18,000	6	18,000
Labor (family)						
Field preparation	pers/day	1,000	4		4	
Transplant	pers/day	1,000	5		5	
Irrigation construction/management	pers/day	1,000			5	
Fertilizer application	pers/day	1,000	6		6	
Weeding	pers/day	1,000	20		20	
Harvesting and transport	pers/day	1,000	7		8	
Marketing	pers/day	1,000	3		3	
Labor (hired)	pers/day	1,000	12	12,000	12	12,000
Fertiliser						
Manure	25kg bags	500	50	25,000	50	25,000
Urea	50kg bags	6,100	5	30,500	5	30,500
TSP	50kg bags	9,500	1	9,500	1	9,500
Packing						
Bags/boxes	units	150	300	45,000	405	60,750
Transport		100	300	30,000	405	40,500
Tax (zakat/jizya) 5 %				45,000		60,750
Total	YER			**244,000**		**286,000**
Net benefits	YER			**656,000**		**929,000**
Incremental net benefits	YER				**273,000**	

Lentils (rainfeed), 1 ha

			WOP		WP	
Items	**Unit**	**Unit cost**	**Qty**	**Costs and Income**	**Qty**	**Costs and Income**
Main production						
Dry lentils	kg	220	700	154,000	840	184,800
By product						
Legume straw (dry, grazed on the field)	kg	4	1,500		1,650	
Gross value of production				**154,000**		**184,800**
Production costs						
Seeds	kg	220	70	15,400	70	15,400
Cultivation						
Tractor hire (ploughing /levelling)	day	3,000	6	18,000	6	18,000
Labor (family)						
Field preparation	pers/day	1,000	12		12	
Sowing	pers/day	1,000	5		5	
Irrigation construction/management	pers/day	1,000			3	
Fertilizer application	pers/day	1,000	2		2	
Weeding and thinning	pers/day	1,000	20		20	
Harvesting and transport	pers/day	1,000	3		8	
Processing	pers/day	1,000	13		16	
Marketing	pers/day	1,000	3		4	
Labor (hired)	pers/day	1,000	12	12,000	12	12,000
Transport	per bag	100	20	2,000	24	2,400
Fertiliser						
Manure	25kg bags	450	25	11,250	25	11,250
Packing						
Bags/boxes	units	25	20	500	24	600
Tax (zakat/jizya) 5 %				7,700		9,240
Total costs	YER			**64,850**		**56,650**
Net benefits	YER			**89,150**		**128,150**
Incremental net benefits	YER				**39,000**	

Bananes production (existing plantation) with improved irrigation (1ha)

Yields and inputs

Item	Unit	Price	Without project	With project PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9-PY20
Main production												
Banana fruit after losses	ton		8.0	9.0	10.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Production costs												
Investment												
On-farm irrigation equipment	set											
Operating costs												
Land preparation (ploughing)	hours		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Inputs												
Farmyard manure (@ 3 kg/pit)	ton		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fertilizer (urea)	sack		0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Fertilizer	sack		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Insecticides	l/s		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Labor												
Opening irrigation channels	hours		0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Maintenance of irrigation channels	person/day		0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Weeding	person/day		4	4	4	4	4	4	4	4	4	4
Pruning and pulling off-shoots	person/day		13	13	13	13	13	13	13	13	13	13
Harvesting (cutting, collection) per year	person/day		6	7	7	7	7	7	7	7	7	7
Transport of produce per year	truck		3	4	4	4	4	4	4	4	4	4
Tax (zakat/jizya) 5 %	%		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Costs

Item	Unit	Price (YER)	Without project	With project PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9-PY20
Main production												
Banana fruit after losses	YER/ton	100,000	800,000	900,000	1,000,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
			800,000	**900,000**	**1,000,000**	**1,100,000**	**1,100,000**	**1,100,000**	**1,100,000**	**1,100,000**	**1,100,000**	1,100,000
Production costs												
Investment costs												
On-farm irrigation equipment	YER/set			128,400								
Operating costs												
Land preparation (ploughing)	hours	3,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Inputs												
Farmyard manure (@ 3 kg/pit)	YER/ton	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Fertilizer (urea)	YER/sack	6,100	0	3,050	3,050	3,050	3,050	3,050	3,050	3,050	3,050	3,050
Fertilizer	YER/sack	9,500	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750
Insecticides	l/s	10,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Labor (family)												
Weeding	person/day	0	0	0	0	0	0	0	0	0	0	0
Labor (hired)												
Opening irrigation channels	YER	3,000	0	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Maintenance of irrigation channels	YER	1,000	0	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Pruning and pulling off-shoots	YER	1,000	12,800	12,800	12,800	12,800	12,800	12,800	12,800	12,800	12,800	12,800
Harvesting (cutting, collection) per year	YER	1,000	6,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
Transport of produce per year	YER	5,000	15,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Replacement costs							1,284				1,284	
Tax (zakat/jizya) 5 %	YER		40,000	45,000	50,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Total costs			**100,050**	**248,500**	**125,100**	**130,100**	**131,384**	**130,100**	**130,100**	**130,100**	**131,384**	**130,100**
Net benefits			**699,950**	**651,500**	**874,900**	**969,900**	**968,616**	**969,900**	**969,900**	**969,900**	**968,616**	**968,616**
Returns to family labour			**30,700**	**24,310**	**32,646**	**36,190**	**36,142**	**36,190**	**36,190**	**36,190**	**36,142**	**36,142**
Incremental net benefits				**-48,450**	**174,950**	**269,950**	**268,666**	**269,950**	**269,950**	**269,950**	**268,666**	**268,666**

Greenhouse/tomatoes production(0.05ha)

Yields and inputs

Item	Unit	Price	Without project	With project						
				PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
Main Production											
Tomatoes production after losses	kg		150	165	206	206	206	206	206	206	206
Production costs											
Investment costs											
Greenhouse and on farm irrigation	lumpsum		0	1	0	0	0	0	0	0	0
Operating costs											
Fertilizer											
Manure	25kg bag		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Urea	50kg bag		0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
TSP	50kg bag		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Seedlings	each		290	290	290	290	290	290	290	290	290
Boxes	each		6	7	8	8	8	8	8	8	8
Transport	per box		6	7	8	8	8	8	8	8	8
Labour (family)											
Soil preparation	days		1	1	1	1	1	1	1	1	1
Planting/trans-planting	days		2	2	2	2	2	2	2	2	2
Fertilizer application	days		1	1	1	1	1	1	1	1	1
Weeding	days		3	3	3	3	3	3	3	3	3
Watering	days		5	5	5	5	5	5	5	5	5
Greenhouse maintenance	days		0	3	3	3	3	3	3	3	3
Harvesting	days		4	6	6	6	6	6	6	6	6
Packaging and loading	days		2	4	4	4	4	4	4	4	4
Subtotal labour			9	12	12	12	12	12	12	12	12

Revenue

Item	Unit	Price (YER)	Without project	With project						
				PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
Main Production											
Tomatoes production after losses	kg	300.0	45,000	49,500	61,875	61,875	61,875	61,875	61,875	61,875	61,875
Production costs											
Investment costs											
Greenhouse and on farm irrigation (1)	lumpsum	220,420		220,420							
Operating costs											
Fertilizer											
Manure	25kg bag	500	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Urea	50kg bag	6,100	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,525
TSP	50kg bag	9,500	475	475	475	475	475	475	475	475	475
Seedlings	each	5.00	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450
Boxes	each	150	900	990	1,238	1,238	1,238	1,238	1,238	1,238	1,238
Transport	per box	100	600	660	825	825	825	825	825	825	825
Subtotal operating costs			6,200	6,350	6,763	6,763	6,763	6,763	6,763	6,763	6,763
Labour (family)											
Soil preparation	days	1,000									
Planting/trans-planting	days	1,000									
Fertilizer application	days	1,000									
Weeding	days	1,000									
Watering	days	1,000									
Greenhouse maintenance	days	1,000									
Harvesting	days	1,000									
Packaging and loading	days	1,000									
Tax (zakat/jizya) 5 %			2,250	2,475	3,094	3,094	3,094	3,094	3,094	3,094	3,094
Total production costs			8,450	8,825	9,856	9,856	9,856	9,856	9,856	9,856	9,856
Net benefits			36,550	-179,745	52,019	52,019	52,019	52,019	52,019	52,019	52,019
Returns to family labour			4,061	-14,673	4,246	4,246	4,246	4,246	4,246	4,246	4,246
Net incremental benefits				-216,295	15,469	15,469	15,469	15,469	15,469	15,469	15,469

(1)Cost of equipment: 20% by beneficiaries, 80% by the project

Stationary beekeeping

Items	Unit	Without project	With project PY1	PY2	PY3	PY4	PY5	PY6-20	PY7	PY8	PY9-PY20
Main product											
Honey	kg		5	10	15	20	20	20	20	20	20
By product											
Wax	kg		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Investment											
Modern bee-hives and colony	unit		5								
Queen screen	unit		5								
Face net, smoker, brush, feeding equipment	set		0.2								
Operating Inputs											
Sugar	kg		80	80	80	80	80	80	80	80	80
Labor (family)	pers/day		25	25	25	25	25	25	25	25	25

Financial Budget (YER)	Unit	Unit cost	PY1	PY2	PY3	PY4	PY5	PY6-20	PY7	PY8	PY9
Main production											
Honey		3,150	15,750	31,500	47,250	63,000	63,000	63,000	63,000	63,000	63,000
By product											
Wax											
Gross value of production			**15,750**	**31,500**	**47,250**	**63,000**	**63,000**	**63,000**	**63,000**	**63,000**	**63,000**
Production costs											
Investment Costs (1)											
Modern bee-hives and colony		20,000	50,000								
Queen screen		800	2,000								
Face net, smoker, brush, feeding equipment		15,000	1,500								
Operating Costs											
Sugar		315	25,200	25,200	25,200	25,200	25,200	25,200	25,200	25,200	25,200
Replacement Costs						1,070				1,070	
Total costs			78,700	25,200	25,200	26,270	25,200	25,200	25,200	26,270	25,200
Net benefits			-62,950	6,300	22,050	36,730	37,800	37,800	37,800	36,730	37,800
Return to family labor			-2,518	252	882	1,469	1,512	1,512	1,512	1,469	1,512
Incremental net benefits			-62,950	6,300	22,050	36,730	37,800	37,800	37,800	36,730	37,800

(1)After deduction of project grant (50%)

Financial budget
100 stables. Improved animal housing.
The herd projection was done within an aggregated model of 100 farms (owning 1 head of cattle and 14 small ruminants each).

Yields and inputs

Item	Unit	Price	Without project	With Project YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9-PY20
Parameters and assumptions												
Small ruminants (goats)												
Flock composition at beginning of year												
Mature animals (+15 months)												
males	each		65	65	65	65	65	65	65	65	65	65
females	each		65	65	65	65	65	65	65	65	65	65
Young animals (0-15 months)	each											
males	each		35	35	35	35	35	35	35	35	35	35
females	each		35	35	35	35	35	35	35	35	35	35
Sales including culls												
Mature animals (+15 months)	each		30	30	30	30	30	30	30	30	30	30
Young animals (0-15 months)	each		30	30	30	30	30	30	30	30	30	30
Total sales	each		60	60	60	60	60	60	60	60	60	60
TOTAL FLOCK			140	140	140	140	140	140	140	140	140	140
Lactation performance												
Period	days		160	160	160	160	160	160	160	160	160	160
Milk yield - daily average w inter	liters		1.5	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Milk yield - daily average summer	liters		2.5	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Milk yield - total lactation	lt/head/Y		342	428	449	449	449	449	449	449	449	449
Total herd output	liters		21,119	26,398	27,718	27,718	27,718	27,718	27,718	27,718	27,718	27,718
Weaning consumption	lt/day		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Weaning age	days		65	65	65	65	65	65	65	65	65	65
Weaning consumption - total herd	litres		4,550	4,550	4,550	4,550	4,550	4,550	4,550	4,550	4,550	4,550
Cattle(dairy)												
Herd composition at beginning of year												
Bulls	each		14	14	14	14	14	14	14	14	14	14
Breeding cow s	each		54	54	54	54	54	54	54	54	54	54
Calves	each		32	32	32	32	32	32	32	32	32	32
Heifers	each		10	10	10	10	10	10	10	10	10	10
Steers	each		9	9	9	9	9	9	9	9	9	9
TOTAL HERD	each		100	100	100	100	100	100	100	100	100	100
Sales (including culls)												
Culled males	each		1	1	1	1	1	1	1	1	1	1
Culled heifers	each		1	1	1	1	1	1	1	1	1	1
Lactation performance												
Period	days		260	260	260	260	260	260	260	260	260	260
Milk yield - daily average w inter	liters		3	4.0	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Milk yield - daily average summer	liters		5	6.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Milk yield - total lactation	lt/head/Y		1,064	1,330	1,397	1,397	1,397	1,397	1,397	1,397	1,397	1,397
Total herd output	liters		54,583	68,229	71,640	71,640	71,640	71,640	71,640	71,640	71,640	71,640
Calves consumption	lt/day		1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Weaning age	days		90	90	90	90	90	90	90	90	90	90
Calves consumption - total herd	lt		2,843	3,412	3,412	3,412	3,412	3,412	3,412	3,412	3,412	3,412
Main Production												
Milk for sale and self-consumption												
Cattle	litres		51,740	64,817	68,229	68,229	68,229	68,229	68,229	68,229	68,229	68,229
Small ruminants	litres		16,569	21,848	23,168	23,168	23,168	23,168	23,168	23,168	23,168	23,168
Animal sales (including culls)												
Cattle												
males	each		1	1	1	1	1	1	1	1	1	1
heifers	each		1	1	1	1	1	1	1	1	1	1
Small ruminants	each		60	60	30	30	30	30	30	30	30	30
Manure - total herd	kg/year		142,015	142,015	142,015	142,015	142,015	142,015	142,015	142,015	142,015	142,015
Operating costs												
Small ruminants												
Straw / hay a/	ton		13	13	13	13	13	13	13	13	13	13
Sorghum stover	ton		6	6	6	6	6	6	6	6	6	6
Cattle												
Straw / hay a/	ton		55	55	55	55	55	55	55	55	55	55
Sorghum stover	ton		9	9	9	9	9	9	9	9	9	9
Mineral feeding	kg		299	299	299	299	299	299	299	299	299	299
Veterinary and other costs	per year		200	200	200	200	200	200	200	200	200	200
Breeding	cow		54	54	54	54	54	54	54	54	54	54
Subtotal operating costs												
Labour (family)												
Milking	ers/days/year		572	572	572	572	572	572	572	572	572	572
Subtotal labour			572	572	572	572	572	572	572	572	572	572

Revenue

Item	Unit	Price	Without project	With Project YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9-PY20
Main Production												
Milk for sale and self-consumption												
Cattle	litres	135	6,984,914	8,750,333	9,210,879	9,210,879	9,210,879	9,210,879	9,210,879	9,210,879	9,210,879	9,210,879
Small ruminants	litres	117	1,938,515	2,556,231	2,710,660	2,710,660	2,710,660	2,710,660	2,710,660	2,710,660	2,710,660	2,710,660
Animal sales (including culls)												
Cattle												
males	each	28,250	28,250	38,138	38,138	38,138	38,138	38,138	38,138	38,138	38,138	38,138
heifers	each	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Small ruminants												
Mature animals (+15 months)	each	7,910	237,300	237,300	237,300	237,300	237,300	237,300	237,300	237,300	237,300	237,300
Young animals (0-15 months)	each	15,171	455,125	455,125	455,125	455,125	455,125	455,125	455,125	455,125	455,125	455,125
Manure - total herd	kg	17	2,451,380	2,451,380	2,451,380	2,451,380	2,451,380	2,451,380	2,451,380	2,451,380	2,451,380	2,451,380
Subtotal Main Production			12,113,483	14,506,506	15,121,481	15,121,481	15,121,481	15,121,481	15,121,481	15,121,481	15,121,481	15,121,481
Operating costs												
Small ruminants												
Straw	ton	1,381	17,641	17,641	17,641	17,641	17,641	17,641	17,641	17,641	17,641	17,641
Sorghum stover	ton	34,523	220,514	220,514	220,514	220,514	220,514	220,514	220,514	220,514	220,514	220,514
Cattle												
Straw	ton	1,381	75,295	75,295	75,295	75,295	75,295	75,295	75,295	75,295	75,295	75,295
Sorghum stover	ton	34,523	313,729	313,729	313,729	313,729	313,729	313,729	313,729	313,729	313,729	313,729
Mineral feeding	unit	1,726		515,718	515,718	515,718	515,718	515,718	515,718	515,718	515,718	515,718
Veterinary costs	per year	1,918		383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586	383,586
Breeding	cow	1,036	55,927	55,927	55,927	55,927	55,927	55,927	55,927	55,927	55,927	55,927
Subtotal operating costs			683,105	1,582,410	1,582,410	1,582,410	1,582,410	1,582,410	1,582,410	1,582,410	1,582,410	1,582,410
Labour (family)												
Milking	ıers/days/yea	500	286,000	286,000	286,000	286,000	286,000	286,000	286,000	286,000	286,000	286,000
Subtotal labour			286,000	286,000	286,000	286,000	286,000	286,000	286,000	286,000	286,000	286,000
Total costs			969,105	1,868,410	1,868,410	1,868,410	1,868,410	1,868,410	1,868,410	1,868,410	1,868,410	1,868,410
Net benefits			11,144,378	12,638,096	13,253,071	13,253,071	13,253,071	13,253,071	13,253,071	13,253,071	13,253,071	13,253,071
Returns to family labour			19,483	22,095	23,170	23,170	23,170	23,170	23,170	23,170	23,170	23,170
Incremental net benefit				1,493,719	2,108,693	2,108,693	2,108,693	2,108,693	2,108,693	2,108,693	2,108,693	2,108,693
Incremental net benefit per stable				14,937	21,087	21,087	21,087	21,087	21,087	21,087	21,087	21,087

Coffee (new plantation) production with improved irrigation, 1 ha

Items	Unit	PY1	PY2	PY3	PY4	PY5	PY6-20	PY7	PY8	PY9-PY20
Main production										
Coffee with husks, dried	kg			500	1,000	1,500	2,000	2,500	2,500	2,500
Production costs										
Investment Inputs										
Seedlings (900/ha+10% replacement)	unit	990								
Fertilizer (manure)	kg	50								
Labor (family)	pers/day	230								
Labor (hired)	pers/day	70								
Tractor hire (ploughing)	hours	23								
Operating Inputs										
Tractor hire (inter row cultivation)	hours		16	16	16	16	16	16	16	16
Fertiliser (manure)	bags		50	50	50	50	50	50	50	50
Labor (family)										
Weeding and spraying	pers/hours		75	75	75	75	75	75	75	75
Fertilizer distribution	pers/hours		5	5	5	5	5	5	5	5
Water application/summer	pers/hours		75	75	75	75	75	75	75	75
Water application/winter	pers/hours		12	12	12	12	12	12	12	12
Harvesting and transport				23	30	30	30	30	30	30
Coffee drying				7	14	14	20	20	20	20
Marketing				3	4	4	5	5	5	5
Labor (hired)			40	40	55	55	77	77	77	77

Financial Budget (YER)	Unit	Unit cost	PY1	PY2	PY3	PY4	PY5	PY6-20	PY7	PY8	PY9=PY20
Gross value of production	kg	950	0	0	475,000	950,000	1,425,000	2,375,000	2,375,000	2,375,000	2,375,000
Production costs											
Investment Costs											
Seedlings (900/ha+10% replacement)	unit	192	189,875								
Fertilizer (manure)	kg	500	25,000								
Labor (family)	pers/day	1,000	230,000								
Labor (hired)	pers/day	1,000	70,000								
Tractor hire (ploughing)	hours	3,000	69,000								
Operating Costs											
Tractor hire (inter row cultivation)	hours	3,000		48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000
Fertiliser (manure)	bag	500		25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Labor (family)											
Weeding and spraying	pers/day	1,000									
Fertilizer distribution	pers/day	1,000									
Water application/summer	pers/day	1,000									
Water application/winter	pers/day	1,000									
Harvesting and transport	pers/day	1,000									
Coffee drying	pers/day	1,000									
Marketing	pers/day	1,000									
Labor (hired)	pers/day	1,000		40,000	40,000	55,000	55,000	77,000	77,000	77,000	77,000
Maintenance costs	lmps			5,839	5,839	5,839	5,839	5,839	5,839	5,839	5,839
Total costs			583,875	118,839	118,839	133,839	133,839	155,839	155,839	155,839	155,839
Net benefits			-583,875	-118,839	356,161	816,161	1,291,161	2,219,161	2,219,161	2,219,161	2,219,161
Incremental net benefits			-583,875	-118,839	356,161	816,161	1,291,161	2,219,161	2,219,161	2,219,161	2,219,161

Economic Analysis.

Irrigation models

Large water harvesting strucure (1)			Small water harvesting strucure (1)			Spate irrigation (2)		
Technical Characteristics and Assumptions, Benefits and Costs								
Capacity (3) :	50,000	m3	Capacity (3) :	20,000	m3	Technique: floodwater is diverted from its river bed and channelled to basins where it is used		
						Water use: (a) agriculture/ crop irrigation ;		
Water availability (4)	71,250	m3	Water availability (4)	28,500	m3			
						Size : small scheme, ranging from a few hectares, usually located on tributary wadis in mountain areas, or in plain supplied by small wadis		
Water use, m3	agriculture	animal watering	Water use, m3	agriculture	animal watering			
	57,000	14,250		22,800	5,700	Main crops in spate areas: sorghum (grain and fodder)		
Agriculture			Agriculture			Agriculture		
Command area of scheme irrgation (2)	16	ha	Command area of scheme irrgation (2)	7	ha	Command area	25	ha
No of households benefiting	65		No of households benefiting	26		No of households benefiting	100	
No of beneficiaries	456		No of beneficiaries	182		No of beneficiaries	700	
Animal watering			Animal watering			Animal watering: possible feeding of water ponds (500m3) for livestock. Given incertainty in spate floods calculation, livestock water use wasn't inculeded in benefits'calculation		
Animal water use per hhd	58	m3/year	Animal water use per hhd	58	m3/year			
No of family lifestock units benefiting	244		No of households benefiting	98				
No of beneficiaries	1,952		No of beneficiaries	781				
Investment Cost	200,000	US$	Investment Cost	120,000	US$	Investment Cost	80,000	US$
(total investment cost per hhd)	*3,070*	*US$/hhd*	*(total investment cost per hhd)*	*4,605*	*US$/hhd*	*(total investment cost per hhd)*	*800*	*US$/hhd*
Maintenance Cost (% of CW)	1	%	Maintenance Cost (% of CW)	1	%	Maintenance Cost (% of CW)	5	%
Annual Maintenance Cost	2,000	US$	Annual Maintenance Cost	1,200	US$	Annual Maintenance Cost	4,000	US$

(1) Sources: *Dhamar Participatory Rural and Economic Opportunities Project* document (for technical assumptions), RGP COSTAB (for investment costs)

(2)Source: *Guidelines on spate irrigation* , FAO, Rome 2010, July 2013 mission estimates

(3)The annual flow of the reservoir is assumed to be 1.5 times the storage capacity in an average climatic year.

(4) Taking into account 5% evaporation

LARGE WATER HARVESTING STRUCTURE (1)										
Economic Analysis (2)	**PY1**	**PY2**	**PY3**	**PY4**	**PY5**	**PY6**	**PY7**	**PY8**	**PY9**	**PY10-20**
Investment Cost (3)	42,800,000									
Maintenance Cost		428,000	428,000	428,000	428,000	428,000	428,000	428,000	428,000	428,000
Replacement Costs					2,140,000					2,140,000
Benefits (Al-Dhala and Dhamar)										
Crop irrigation		3,532,135	3,532,135	3,532,135	3,532,135	3,532,135	3,532,135	3,532,135	3,532,135	3,532,135
Animal watering		3,644,674	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212
		7,176,809	8,677,347	8,677,347	8,677,347	8,677,347	8,677,347	8,677,347	8,677,347	8,677,347
Cash flow	- 42,800,000	6,748,809	8,249,347	8,249,347	6,109,347	8,249,347	8,249,347	8,249,347	8,249,347	6,109,347
EIRR	17%			Net Present Value (10% discount rate)			19,598,502	YER		
Benefits (Taiz)										
Crop irrigation		5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962
Animal watering		3,644,674	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212
		9,010,636	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174
Cash flow	- 42,800,000	8,582,636	10,083,174	10,083,174	7,943,174	10,083,174	10,083,174	10,083,174	10,083,174	7,943,174
EIRR (4)	22%			Net Present Value (10% discount rate)			33,543,790	YER		

(1) Typical scheme with irrigation capacity of 50,000m3 serving an area of 16 ha which would improve irrigation on existing irrigated land with poor water supply.

(2) Undertaken over a 20-year period

(3) See Detailed Cost tables for details.

(4) Return vary from one agro-ecological zone to another because of different cropping patterns. In Taiz, fruit trees/cash crops (such as coffee) represent about 20% of cropping pattern

SMALL WATER HARVESTING STRUCTURE (1)

Economic Analysis (2)	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10-20
Investment Cost (3)	25,680,000									
Maintenance Cost		256,800	256,800	256,800	256,800	256,800	256,800	256,800	256,800	256,800
Replacement Costs					770,400					770,400
Benefits (Al-Dhala and Dhamar)										
Crop irrigation		1,412,854	1,412,854	1,412,854	1,412,854	1,412,854	1,412,854	1,412,854	1,412,854	1,412,854
Animal watering		1,463,844	2,066,520	2,066,520	2,066,520	2,066,520	2,066,520	2,066,520	2,066,520	2,066,520
		2,876,698	3,479,374	3,479,374	3,479,374	3,479,374	3,479,374	3,479,374	3,479,374	3,479,374
Cash flow	- 25,680,000	2,619,898	3,222,574	3,222,574	2,452,174	3,222,574	3,222,574	3,222,574	3,222,574	2,452,174
EIRR 10%				Net Present Value (10% discount rate)		- 411,882	YER			
Benefits (Taiz)										
Crop irrigation		5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962	5,365,962
Animal watering		3,644,674	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212	5,145,212
		9,010,636	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174	10,511,174
Cash flow	- 25,680,000	8,753,836	10,254,374	10,254,374	9,483,974	10,254,374	10,254,374	10,254,374	10,254,374	9,483,974
EIRR (4) 38%				Net Present Value (10% discount rate)		52,319,220	YER			

(1) The scheme with irrigation capacity of 20,000m3 serving an area of 7 ha which would improve irrigation on existing irrigated land with poor water supply.

(2) Undertaken over a 20-year period

(3) See Detailed Cost tables for details.

(4) Return vary from one agro-ecological zone to another because of different cropping patterns. In Taiz, fruit trees/cash crops (such as coffee) represent about 20% of cropping pattern

SPATE IRRIGATION (1)										
Economic Analysis (2)	**PY1**	**PY2**	**PY3**	**PY4**	**PY5**	**PY6**	**PY7**	**PY8**	**PY9**	**PY10-20**
Investment Cost (3)	17,120,000									
Maintenance Cost (4)		856,000	856,000	856,000	856,000	856,000	856,000	856,000	856,000	856,000
Replacement costs					513,600					513,600
Benefits (Hodeida and Lahej)										
Crop irrigation (sorghum)		2,317,571	5,793,927	11,587,854	11,587,854	11,587,854	11,587,854	11,587,854	11,587,854	11,587,854
Cash flow	- 17,120,000	1,461,571	4,937,927	10,731,854	10,218,254	10,731,854	10,731,854	10,731,854	10,731,854	10,218,254
EIRR	40%			Net Present Value (10% discount rate)		53,315,788	YER			

(1)Command area 25ha.
(2) Undertaken over a 20-year period
(3) See Detailed Cost tables for details.
(4)Maintenance costs are higher because of high sedimentation

Economic Analysis

Drinking Water

DRINKING WATER -ROOF WATER HARVESTING	
Value of time saved per cistern	
Investment costs, YER (1)	**26,750**
Replacement costs (YER)	**535**
Capacity of one cistern: 10,5 m3 / 10.500 liters	
Family water needs (daily): 105 liters (7 persons x 15 liters)	
Length of time: 5 months (or 150 days)	
10,500 / 70 = 100 family/days	
Labor time saved daily (2) : 1 hour (2 hours of water collection halved)	
Hourly value of unskilled labor: YER 1000 per day /8 hrs = 125 YER:	
Shadow pricing of unskilled labor	50%
Economic value of unskilled labor (YER)	63
Economic value of time (1 hour) saved daily (YER)	63
Economic value of time saved over 150 days (YER)	**9,375**
(1)Costs as extracted from the Costab. 300,000 US$ per VU (1VU=4settlements, 1 settlement=600 households	
(2) Estimated at 2% of the investment cost	
(3)Currently, women are fetching water up to 3 km away from the village; about 2h per day	

DRINKING WATER - BOREHOLES	
Value of time saved per borehole	
Investment costs, YER (1)	**13,482,000**
Maintenance costs (2)	**134,820**
Replacement costs (3)	**3,852,000**
Water discharge: 36m3/h daily = 36.000 liters daily	
Family water needs (daily): 70 liters (7 persons x 15 liters)	
Number of households benetiting: 343	
Labor time saved daily (2): 1 hour (2 hours of water collection halved)	
Hourly value of unskilled labor: YER 1.000 per day /8 hrs = YER 125 :	
Shadow pricing of unskilled labor:	50%
Economic value of 1 hour of unskilled labor (YER)	63
Economic value of time (1 hour) saved per family unit daily (YER)	63
Economic value of time saved per family unit per year (YER)	22,500
Economic value of time saved per borehole per year (YER)	**7,714,286**
(1)Costs as extracted from the Costab. 63,000 US$ per borehole	
(2)Maintenance of the water tank (unskilled labor), per year, 1% of the investment cost	
(3)Replacement of the pump (10,000$) and water supply pipelines (8,000$), every 7 years	
(4)Currently, women are fetching water up to 3 km away from the village; about 2h per day	

Economic Analysis

Road Model

Rehabilitation of a Village Road (5.0 km) connecting a village (potatoes producers) with the main road
Technical Characteristics and Assumptions, Benefits and Costs

Investment cost (Costab) 38,520,000 (YER)
Maintenance costs (5%) 1,926,000 (YER)

Current production area: 146ha
(5km*117hhd/km*0.25 ha under potatoes

Description: the road connects one village with the main road

Main anticipated benefits:
1) increased production area (x2)
2) Increased harvest due to improved access to inputs (+10%)
3) Time spent on average journey -80%
4)Time savings for the population served by the road (opportunity cost computed as unskilled labour)

Average hhd per km	117		
Average hhd per road (5km)	583	0.20	
Parameters	**Unit**	**WOP**	**WP**
Average hhd per km	no	117	117
Average hhd per road (5km)	no	583	583
Opportunity cost of unskilled labour per day	YER	500	500
Average journey	km	5	5
Time spent on average journey	hours	3	2
Annual trips per household/year	no	26	39
Total Travel time	days	4,213	3,160
Total opportunity cost of labour	YER	2,106,481	1,579,861
Net saving in labour	YER		526,620
Area cropped under potatoes	ha	146	158
Annual volume of potatoes collected	tons	408	441
Annual volume of potatoes traded	tons	143	221
Net income from traded potatoes	YER	19,293,750	29,767,500
Net incremental income from traded potatoes	YER		10,473,750

Item	YR1	YR2	YR3	YR4-20
Benefits				
Net saving in labour		263310.1852	526,620	526,620
Net income from trade		4189500	7331625	10,473,750
TOTAL benefits		4,452,810	7,858,245	11,000,370
Costs				
Investment Costs				
Road rehabilitation	38,520,000			
Recurrent costs				
Operation and maintenance /a		1,926,000	1,926,000	1,926,000
TOTAL costs	38,520,000	1,926,000	1,926,000	1,926,000
Net Benefit	-38,520,000	2,526,810	5,932,245	9,074,370
EIRR	19%			
Net Present Value (10% discount rate)	26,215,689			

Rangeland

Daily water needs for family livestock unit			
Family livestock unit	Water needs per head (l/day)	Number of heads per family unit	Water needs per unit (l/day)
Small ruminants	10	14	140
Cattle	20	1	20
Total			**160**

N.B.: Calculations of size and composition of family livestock units are based on the mission's assumptions.

Additional animal and milk production per water pond built on a rangeland area (per year)

Capacity of the water pond: 200m3

Daily water needs for family livestock unit: 160 liters

Number of family livestock units per water pond: 14 units or 208 animals (15 animals per unit)

Rangeland opened to pasture and used during the dry season (October-February)

Rangeland area rehabilitated around the water pond: 2ha

Additional animal and milk production due to improved water and grazing availability (2ha)

	Number in a family livestock unit	Number of units	Animal and milk production			Market value (YER)	Additional value per pond (YER)
			without pond	with pond	additional		
Small ruminants							
heads	14	14	194	204	10	7,910	76,903
milk (liters)			6,650	7,315	665	150	99,750
Cattle							
heads	1	38	38	39	2	28,250	52,969
milk (liters)			3,990	4,389	399	135	53,865
Grand total							**283,487**

N.B.: It is assumed that 40% of the small ruminants are females, their milk production is estimated at 342 litres over the year at 200 YER/liter. Cows constitute 40% of the herd, their milk production is 798 liters at 135 YER/liter. It is conservatively assumed that the animal and milk production would increase by 5% over time following substantially better water and feeding supply. Moreover, an additional 5% has been added in the case of animal production (heads used as proxy) to reflect the natural gain in weight of the animals.

Incremental Economic Programme Costs (YER)

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11-20
Investment Costs											
A. Community empowerment.	1,024,604,435	1,753,155,968	1,735,396,694	1,236,242,177	577,750,645	65,880,000	-				
B. Natural Resources Managemer	1,275,185,400	3,191,380,800	4,149,686,163	2,593,300,000	581,855,338	6,750,000	-				
C. Agricultural Development	1,460,700,000	2,966,874,750	2,197,374,750	1,266,549,750	92,812,500	-	-				
D. Project Management	551,697,097	387,180,000	365,805,000	359,055,000	264,555,000	194,490,000	225,990,000				
Total Investment Costs	**4,312,186,932**	**8,298,591,518**	**8,448,262,606**	**5,455,146,927**	**1,516,973,483**	**267,120,000**	**225,990,000**				
Recurrent Costs								**185,490,000**	**185,490,000**	**185,490,000**	**185,490,000**
Replacement costs						**35100000**				**103275000**	
Total costs	**4,312,186,932**	**8,298,591,518**	**8,448,262,606**	**5,455,146,927**	**1,516,973,483**	**302,220,000**	**225,990,000**	**185,490,000**	**185,490,000**	**288,765,000**	**185,490,000**

Programme Incremental Net Economic Benefits (YER)

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11	PY12-20
Irrigation		126,130,957	327,344,120	521,354,673	577,939,271	577,939,271	577,939,271	577,939,271	577,939,271	577,939,271	577,939,271	577,939,271
Drinking water												
Individual scheme		56,250,000	112,500,000	168,750,000	168,750,000	168,750,000	168,750,000	168,750,000	168,750,000	168,750,000	168,750,000	168,750,000
Borehole		154,285,714	408,857,143	578,571,429	578,571,429	578,571,429	578,571,429	578,571,429	578,571,429	578,571,429	578,571,429	578,571,429
Terraces rehabilitation		-64,878,018	-112,035,826	52,508,338	629,241,119	1,200,766,892	1,752,084,392	2,229,141,892	2,510,694,392	2,558,169,392	2,558,169,392	2,558,169,392
IGAs		-221,076,000	-666,781,200	-919,264,800	-763,531,200	1,193,681,280	1,971,882,480	2,827,933,200	2,917,556,400	2,907,387,120	2,895,882,480	2,827,933,200
Roads (km)		47,199,788	152,761,240	305,094,144	433,900,282	502,879,605	523,617,630	523,617,630	523,617,630	523,617,630	523,617,630	523,617,630
Rangelands		8,504,596	17,009,192	17,009,192	17,009,192	17,009,192	17,009,192	17,009,192	17,009,192	17,009,192	17,009,192	17,009,192
Greenhouses		1,761,750	10,532,813	20,295,156	23,808,594	23,808,594	23,808,594	23,808,594	23,808,594	23,808,594	23,808,594	23,808,594
Total		**108,178,787**	**250,187,481**	**744,318,133**	**1,665,688,686**	**4,263,406,262**	**5,613,662,987**	**6,946,771,207**	**7,317,946,907**	**7,355,252,627**	**7,343,747,987**	**7,275,798,707**

Calculation of the Overall EIRR of RGP (YER)

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11	PY12-PY20
Costs	4,312,186,932	8,298,591,518	8,448,262,606	5,455,146,927	1,516,973,483	302,220,000	225,990,000	185,490,000	185,490,000	288,765,000	185,490,000	220,590,000
Benefits	-	108178787	250187481	744318133	1665688686	4263406262	5613662987	6946771207	7317946907	7355252627	7343747987	7275798707
Cash Flow	- 4,312,186,932	- 8,190,412,730	- 8,198,075,125	- 4,710,828,795	148,715,203	3,961,186,262	5,387,672,987	6,761,281,207	7,132,456,907	7,066,487,627	7,158,257,987	7,055,208,707

IRR **15%**
NPV **10,824,703,737**

Sensitivity analysis summary

The base EIRR	15%
20% costs overrun	13%
20% benefits shortfall	12%
Benefits delayed (2-years delay)	11%

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11	PY12-20
Integrated watershed development schemes			290,582	5,835,248	30,638,925	91,740,521	187,671,096	308,491,770	432,078,047	520,017,722	550,813,218	550,813,218
Dams			23,718,857	66,812,354	122,850,540	177,669,932	253,685,803	326,661,039	363,148,657	363,148,657	363,148,657	363,148,657
Spate irrigation			534,672,681	1,618,275,981	3,036,940,827	4,441,347,735	5,553,466,912	6,130,913,407	6,130,913,407	6,130,913,407	6,130,913,407	6,130,913,407
Drinking water - individual scheme			7,660,800	34,473,600	62,244,000	80,438,400	80,438,400	80,438,400	80,438,400	80,438,400	80,438,400	80,438,400
Land rehabilitation (ha)			- 27,720,965	- 151,500,119	- 212,137,618	- 109,585,781	168,397,821	578,018,905	1,074,039,776	1,471,984,285	1,703,965,504	1,780,954,244
Roads (km)			20,035,496	77,932,453	199,765,710	354,892,778	512,228,237	600,176,162	637,298,648	637,298,648	637,298,648	637,298,648
Total benefits			**558,657,451**	**1,651,829,516**	**3,240,302,385**	**5,036,503,584**	**6,755,888,269**	**8,024,699,682**	**8,717,916,935**	**9,203,801,119**	**9,466,577,834**	**9,543,566,574**

Calculation of the Overall EIRR of RGP (YER)

	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11	PY12	PY13	PY14	PY15	PY16	PY17	PY18	PY19	PY20
Costs	1,960,540,200	4,338,280,800	6,559,983,450	6,004,550,700	3,499,394,850	1,049,962,500	351,778,500	247,801,500	247,801,500	351,076,500	247,801,500	282,901,500	247,801,500	247,801,500	247,801,500	247,801,500	247,801,500	282,901,500	247,801,500	351,076,500
Benefits	-		558,657,451	1,651,829,516	3,240,302,385	5,036,503,584	6,755,888,269	8,024,699,682	8,717,916,935	9,203,801,119	9,466,577,834	9,543,566,574	9,543,566,574	9,543,566,574	9,543,566,574	9,543,566,574	9,543,566,574	9,543,566,574	9,543,566,574	9,543,566,574
Cash Flow	- 1,960,540,200	- 4,338,280,800	- 6,001,325,999	- 4,352,721,184	- 259,092,465	3,986,541,084	6,404,109,769	7,776,898,182	8,470,115,435	8,852,724,619	9,218,776,334	9,260,665,074	9,295,765,074	9,295,765,074	9,295,765,074	9,295,765,074	9,295,765,074	9,260,665,074	9,295,765,074	9,192,490,074

IRR 25%
NPV 25,121,274,402

Appendix 11: Compliance with IFAD policies

1. This appendix describes how the Rural Growth Programme is aligned with the relevant IFAD strategies, procedures and policies. These include: (i) Programme Design, Targeting and Sustainability Policies; (ii) Operational Policies; and (ii) Innovation and Knowledge Management Policies. It briefly describes how the Programme complies with each, and provides references to particular sections of the main Programme design report and its related appendices.

Programme Design, Targeting and Sustainability Policies

IFAD's Strategic Framework 2011-2015

2. The goal of IFAD's Strategic Framework 2011-2015 is that poor rural women and men in developing countries are enabled to improve their food security, raise their incomes and strengthen their resilience. This goal is underpinned by five strategic objectives:

- A natural resource and economic asset base for poor rural women and men that is more resilient to climate change, environmental degradation and market transformation;
- Access for poor rural women and men to services to reduce poverty raise incomes and build resilience in a changing environment;
- Poor rural women and men and their organizations able to manage profitable, sustainable and resilient farm and non-farm enterprises or take advantage of decent work opportunities;
- Poor rural women and men and their organizations able to influence policies and institutions that affect their livelihoods; and
- Enabling institutional and policy environments to support agricultural production and the full range of related non-farm activities.

3. The RGP fits perfectly within this overall Strategic Framework. The programme's goal is to improve food security in rural areas, reduce rural poverty and improve smallholder climate resilience. Its development objective is to stimulate sustainable rural economic growth for women and men in rural communities. The programme intends to work with local communities and enhance their capacities and resilience to economic and climate shocks. The programme's expected outcomes are: (i) households and communities resilience to political, economic, climatic and other shocks enhanced; (ii) infrastructure and natural resource base made climate-resilient; (iii) improved gender-sensitive and climate resilient agricultural practices and technologies, and (iv) rural women and men with increased access to economic opportunities. Achievement of these outcomes will contribute to each of the five strategic objectives of IFAD's Strategic Framework.

Climate Change Strategy

4. The goal of IFAD's climate change strategy is to maximize IFAD's impact on rural poverty in a changing climate. The design of this programme will contribute to achieving this goal and the large amount of climate finance mobilized for the RGP from IFAD-ASAP and GEF LDCF is a clear demonstration that the programme's overall concept and approach is one well aligned with climate concerns in Yemen. The RGP design identified water scarcity and lack of proper management of natural resources as a major hindrance to agricultural and livestock development as well as rural development in general. Climate change is projected to have a significant negative impact on the efforts to reduce poverty and improve food security for the rural population, through this channel, as well as through increased food prices. All planned activities address these issues through their focus on the key concerns of water, land, infrastructure, income diversification and agricultural production.

Environment and Natural Resource Management Policy

5. The goal of IFAD's ENRM policy is: to enable poor rural people to escape from and remain out of poverty through more-productive and resilient livelihoods and ecosystems. The purpose is to integrate the sustainable management of natural assets across the activities of IFAD and its partners. The ten core principles of the ENRM policy and the extent to which they are addressed by the RGP is illustrated below.

Core Principles of IFAD ENRM Policy	RGP Response
Scaled-up investment in multiple-benefit approaches for sustainable agricultural intensification	This forms the basis of the RGP design. All planned activities provide multiple benefits in terms of improved climate resilience, increased incomes, and reduced risk.
Recognition and greater awareness of the economic, social and cultural value of natural assets	The inclusion of land and water user associations in the programme design, and basing implementation upon Community Action Plans will ensure that planning and implementation is driven by the communities themselves and that all values of natural assets are embedded in the programme's implementation plans. Particular consideration will be given during implementation to the management of inter and intra community natural resource use conflicts.
'Climate-smart' approaches to rural development	The programme design and targeting is driven by the outcomes of studies on climate risk in Yemen to ensure climate risks and opportunities are considered.
Greater attention to risk and resilience in order to manage environment- and natural-resource related-shocks	Increased climate resilience is a key part of the RGP goal ensuring that it will be a focus of decision makers throughout implementation.
Engagement in value chains to drive green growth	This programme is not explicitly focused on value chain development. This is addressed by other projects with the Yemen country programme.
Improved governance of natural assets for poor rural people by strengthening land tenure and community-led empowerment	The programme will support the establishment of effective user associations for natural assets exploited by the target groups.
Livelihood diversification to reduce vulnerability and build resilience for sustainable natural resource management	The programme supports income diversification as an explicit part of its strategy to reduce vulnerability and build resilience.
Equality and empowerment for women and indigenous peoples in managing natural resources	Women will be included in decision making positions in all natural resource management bodies.
Increased access by poor rural communities to environment and climate finance	Through the programme the targeted poor rural communities will benefit from environment and climate finance (ASAP, GEF-LDCF)
Environmental commitment through changing its own behavior	N/A

Environment Category

6. As the RGP is essentially a programme designed around reducing to vulnerability of target populations, the environmental and social impacts and risks as well as mitigation measures for each component and its activities were assessed during the design stage. As most activities have already been implemented by projects that the RGP is scaling-up, important lessons have been learned with regard to minimizing negative and maximizing positive social and environmental outcomes – particularly with regard to the undertaking of environment impact assessments.

7. These lessons learned have been embedded in the programme design. However, any potential impacts will be assessed and quantified during programme implementation. The PMU will be responsible for ensuring that the requirements of the environmental legislation of Yemen are adhered

to in order to avoid negative impacts, and, when and if necessary, introduce appropriate mitigation measures. On this basis, it is proposed to classify the programme under Category B.

Gender Policy

8. The IFAD strategy for gender mainstreaming and women's empowerment focuses on a three-pronged strategy: (i) expand women's economic empowerment through access to and control over key assets; (ii) strengthen women's decision-making role in community affairs and representation in local institutions; and (iii) improve the knowledge and well-being of women and ease women's workloads by facilitating women's access to basic rural services and infrastructures. The RGP will approach gender mainstreaming and women's empowerment using each of these strategies. More detail on this, together with information on how IFAD's Prerequisites for Gender Sensitive Design have been taken into account in the RGP design, is provided below.

1. Does the design document contain a context-specific gender strategy that aims to:
Expand women's access to and control over fundamental assets - capital, land, knowledge and technologies: Yes The programme provides particular support to women in terms of literacy and life-skills training and training as Village Agriculture Technicians (knowledge), establishment of women's saving and credit associations (capital), and finance and technical support for income generating activities and micro-businesses (knowledge, capital, technologies).
Strengthen their agency - thus their decision-making role in community affairs and representation in local institutions: Yes - All Community Development Associations and Women's Saving and Credit Associations will have women in decision making positions.
Improve well-being and ease workload: Yes - Significant investments will be made in domestic water and road improvement, both of which have been shown in the ongoing programmes in Yemen to bring significant benefits to women by improving access to water and cooking gas and reducing time spent collecting water and firewood.
2. The programme identifies operational measures to ensure gender-equitable participation in, and benefit from, planned activities, and in particular:
Sets indicative and realistic targets in terms of proportion of women participants in different programme activities and components: Yes - Targets have been set for women's participation in specific activities.
Establishes women's participation in programme-related decision-making bodies (such as Water User Associations; committees taking decisions on micro-projects; etc.): Yes - All Community Development Associations and Women's Saving and Credit Associations will have women in decision making positions.
Reflects attention to gender equality/ women's' empowerment in project/programme management arrangements (e.g. including in Terms of Reference of project coordinating unit or project management unit (PMU) responsibilities for gender mainstreaming; inclusion of gender focal point in NPCU, etc.).: Yes - All Community Facilitation teams will be gender-balanced, and each Governorate level PMU will include a Community Development and Gender Specialist as one of the key staff.
Explicitly addresses the issue of outreach to women (e.g. through female field staff; NGO group promoters, etc.) especially where women's mobility is limited: Yes - All Community Facilitation teams will be gender-balanced.
3. The project logframe and suggested monitoring system specify sex-disaggregated performance and impact indicators. Performance and impact indicators are/will be gender disaggregated where relevant. The programme monitoring system will incorporate gender disaggregated data.

Targeting Policy

9. In order to ensure programme benefits reach IFAD's target group - rural people living in poverty and food insecurity – target groups have been defined, a targeting strategy developed and means of operationalizing that strategy integrated into the Programme design and implementation modalities.

Targeting Checklist Questions

1. Does the main target group - those expected to benefit most - correspond to IFAD's target group as defined by the Targeting Policy (the extremely poor and food insecure):

The programme's target group will consist of poor food insecure rural households living in selected communities with a specific focus on women and youth. However, other households will also benefit from the programmes investments in public goods and civil works such as roads and community schemes for drinking water. Transparent targeting procedures, based on mechanisms applied by ongoing projects will be implemented. Efforts will be made to ensure the involvement of women in decision-making and leadership positions in community organizations. At full development, the programme is expected to directly benefit around 1.2 million individuals, of whom around 0.8 million live below the poverty line. The village unit formation process includes specific poverty targeting criteria.

2. Have target sub-groups been identified and described according to their different socio-economic characteristics, assets and livelihoods - with due attention to gender differences:

The target groups have been identified and described in the Main Report and Appendix 2.

3. Is evidence provided by interest in and likely uptake of the proposed activities by the identified target sub-groups?

The activities included in the programme are almost entirely activities which have proved successful and popular in the 3 projects being scaled up - the only new activities concern renewable energy and agricultural inputs supply, both of which are issues which programme staff and field visits undertaken during design indicate are of major concern to the target groups. The existence of significant demand was the driving force for the decision to scale up these projects.

4. Does the design document describe a feasible and operational targeting strategy in line with the Targeting Policy? The targeting strategy will involve either all or some of the following measures and methods: (i) Geographic targeting; (ii) Enabling measures; (iii) Empowerment and capacity building measures; (iv) Direct targeting; and (v) Attention to procedural mechanisms.

Forms of targeting incorporated into the design include: (i) geographic targeting (this is the main targeting mechanism); (ii) enabling measures; (iii) empowerment and capacity building; (iv) self-targeting; and (v) direct targeting. Targeting aspects are described in Appendix 2.

5. Monitoring targeting performance. Does the design document specify that targeting performance will be monitored using participatory M&E, and also be assessed at Mid-Term review

In 6 it is stated that participatory M&E will be used to monitor targeting performance. It will also be assessed during annual supervision missions and at mid-term review as a necessary element of assessing progress towards achievement of programme objectives.

Operation Policies

Preventing Fraud and Corruption

10. Anticorruption measures will include (a) undertake necessary measures to create and sustain a corruption-free environment for activities under the Programme; (b) institute, maintain and ensure compliance with internal procedures and controls for activities under the Programme, following international best practice standards for the purpose of preventing corruption, money laundering activities, and the financing of terrorists, and shall require all relevant ministries and agencies to refrain from engaging in any such activities; (c) comply with requirements of IFAD's Policy on Preventing Fraud and Corruption in Its Activities and Operations (2005, as amended to date); (d) ensure that the Good Governance Framework is implemented in a timely manner. The Borrower shall also ensure that: (i) it is actively engaged to allow potential Programme beneficiaries and other stakeholders to channel and address any complaints they may have on the implementation of the Programme; and (ii) after conducting any necessary investigation, the Borrower shall immediately report to the Fund any malfeasance or maladministration occurred under the Programme. A good governance framework will be provided in the final design report.

11. Programme design includes specific measures to ensure transparency: (i) institutional arrangements: the programme will be coordinated by a NPCU and managed by PMUs based on principles of good governance, transparency, and accountability; (ii) ethics: a code of ethics will be applicable to, and signed by NPCU and PMUs managers and employees; (iii) internal audit: the

NPCU includes an internal audit unit directly reporting to the National Steering Committee; (iv) independent audit: the NPCU and PMUs will be audited annually by a competitively-selected independent auditor, in line with international auditing standards, and (v) supervision: IFAD's direct supervision includes modules on fiduciary compliance and the responsibility and accountability framework. Communities will be involved in all phases of decision-making, planning, implementation and evaluation, as documented in this report and enshrined in the operational modalities of the programme. Evaluation and impact assessment will be outsourced to independent institutions to ensure analytical objectivity.

Procurement Guidelines

12. Procurement procedures are detailed in the Main Report and in Appendix 8. They are in line with IFAD Procurement Guidelines (please see section D of the main report and Appendix 7). The programme will be subject to annual audits and review of procurement procedures and documentation will be a core focus of all supervision missions.

Supervision and Implementation Support Policy

13. In line with IFAD policy and criteria for selection of supervision approaches the RGP will be directly supervised by IFAD. This will enable the country team to provide implementation support with focus on: (i) providing direct support to the Programme management in terms of continuous guidance for maintain the Programme on the right track for the achievement of the Programme objectives; (ii) adapting Programme interventions to changes which may be dictated by exogenous factors of natural, political or financial nature; (iii) resolving problems of technical nature pertaining to Programme operations; and (iv) providing knowledge-based support about best practices and success stories, from other interventions in Yemen, in the region or elsewhere.

Innovation and Knowledge Management Policies

Innovation

14. The programme does not aim to be technically innovative, but it is innovative in the approach it takes to scaling up proven successful approaches and activities of several different projects within one larger programme. Technical innovations are primarily restricted to the programme's approach to mainstreaming the promotion of climate resilience in design and implementation through use of climate modeling and GIS.

Knowledge Management

15. The Programme intends to promote: (i) in-country knowledge networking through periodic seminars/workshops; (ii) regional knowledge networking such as Karianet, and (iii) regional research networks including those supported by IFAD grants. The IFAD country team will contribute to in-house knowledge sharing and networking.

Appendix 12: Contents of the Programme Life File

The Programme Life File includes:

- Yemen COSOP (2007 – 2013)
- Country Portfolio of Loans and Grants (PPMS)
- Recent Supervision Reports and Mid-Term Reviews
- Concept Note (June 2012)
- Mapping Climate Change Impacts on Smallholder Agriculture in Yemen (Working Paper)
- RGP Financial and Economic Analysis (Working Paper)