

**Document of**  
**The International Fund for Agricultural Development**  
**For Official Use Only**

**THE STATE OF ERITREA**  
**POST-CRISIS RURAL RECOVERY AND DEVELOPMENT PROGRAMME**  
**(PCRRDP): ADD-ON PROGRAMME**

**PROGRAMME DESIGN REPORT**

**Eastern and Southern Africa Division**  
**Programme Management Department**

**October 2009**

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without the authorization of the International Fund for Agricultural Development (IFAD).



## THE STATE OF ERITREA

### POST-CRISIS RURAL RECOVERY AND DEVELOPMENT PROGRAMME (PCRRDP)

#### ADD-ON PROGRAMME

#### PROGRAMME DESIGN REPORT

#### TABLE OF CONTENTS

	<u>Page</u>
Currency Equivalents	iii
Weights and Measures	iii
Fiscal Year	iii
Abbreviations and Acronyms	iii
Map of IFAD Operations in the Country	v
Map of the Programme Area	vii
Programme Summary	ix
<b>INTRODUCTION</b>	<b>1</b>
<b>I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING</b>	<b>2</b>
A. The Country Situation, Global Food Shortage and Soaring Food Prices	2
B. Country Programme Management	2
C. Justification for Additional Support	2
<b>II. COUNTRY, RURAL POVERTY AND SECTORAL CONTEXT</b>	<b>3</b>
<b>III. DESCRIPTION OF ADD-ON ACTIONS</b>	<b>4</b>
<b>IV. PROGRAMME COSTS, FINANCING, PROCUREMENT AND DISBURSEMENT</b>	<b>10</b>
A. Project Costs and Financing	10
B. Procurement, Disbursement, Accounts and Audit	11
<b>V. IMPLEMENTATION AND INSTITUTIONAL ARRANGEMENT</b>	<b>14</b>
A. Organization and Coordination Arrangements	14
B. The Implementation Arrangements	15
C. Monitoring and Reporting	16
<b>VI. PROGRAMME BENEFITS, RISKS AND SUSTAINABILITY</b>	<b>19</b>
A. Benefits	19
B. Risks, Analysis and Mitigants	20
C. Sustainability, Replicability, and Exit Strategy	20
<b>VII. SUPPLEMENTARY ASSURANCES AND CONDITIONS TO BE INCLUDED IN IFAD FINANCING AGREEMENT</b>	<b>21</b>
<b>TABLES</b>	
Table 1: Target Production in ha over Project Life	5
Table 2: Estimated Certified Seed Supply by the Add-on Programme	6
Table 3: Summary Costs Estimate by Components (USD'000)	10
Table 4: Financing by Components (USD '000)	11
Table 5: Procurement packages by Financiers	12
Table 6: Returns on Enterprises/Farm Models (ERN)	19

## **ANNEXES**

Annex I-1: Logical Framework

Annex I-2: Results Framework

Annex II: Summary Cost Tables

Annex III: Detailed Financing Plan

Annex IV: First 18 Months Procurement Plan

## **APPENDICES**

Appendix 1: Detailed Cost Tables – Total Programme

Appendix 2: Detailed Cost Tables for EC-financed Activities

Appendix 3: Enterprise Inputs/Outputs Coefficients and Targets

Appendix 4: Estimated Outputs

Appendix 5: Financial and Economic Analysis

## **CHARTS**

Chart 1: Programme Organogramme

Chart 2: IFAD/EC/GOE Fund Flow

Chart 3: Programme Implementation Schedule

## **CURRENCY EQUIVALENT**

Currency Unit = Eritrean Nakfa (ERN)  
USD 1.00 = ERN 15  
ERN 1 = USD 0.0667

## **WEIGHT AND MEASURES**

Kilogram (kg) = 2.204 lb  
1000 kg = 1 metric ton (m/t)  
1kilometre (km) = 0.62mile  
1 meter (m) = 1.09 yards  
1 square meter (m) = 10.76 square feet  
1 acre (ac) = 0.405 hectare (ha)  
1 hectare (ha) = 2.47 acres (ac)  
1 quintal = 100 kilograms (kg)

## **FISCAL YEAR**

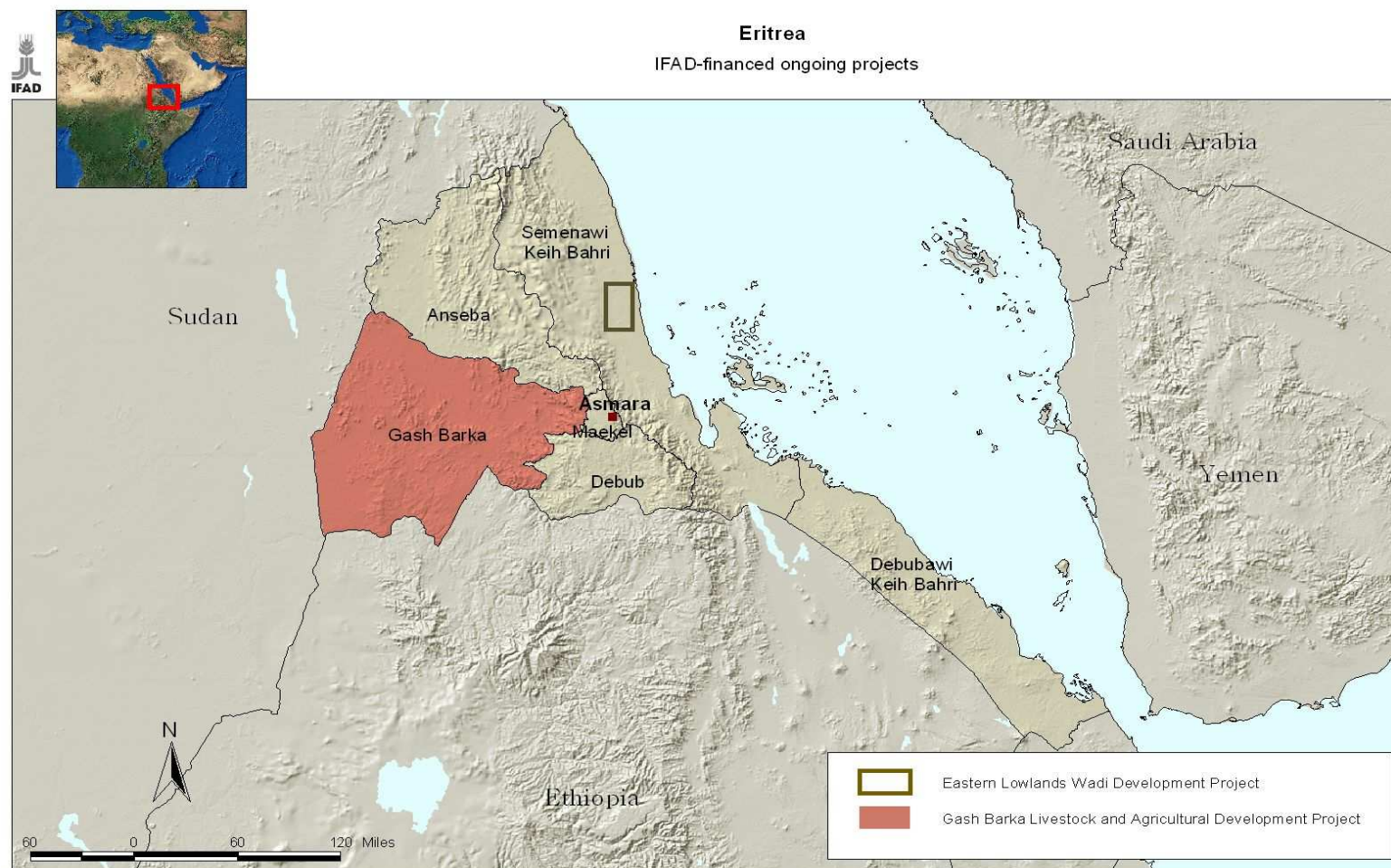
1 January- 31 December

## **ABBREVIATIONS AND ACRONYMS**

ADP	Agricultural Development Programme
AEZ	Agro-Ecological Zone
AfDB	African Development Bank
APDD	Agricultural Promotion and Development
CAADP	Comprehensive Africa Agricultural Development Programme
CIP	International Protective Centre
CIMMYT	International Maize and Wheat Improving Centre
CAHW	Community Animal Health Workers
COSOP	Country Strategy Opportunities Paper
CPMT	Country Programme Management Team
EC	European Communities
ELWDP	Eastern Lowlands Wadi Development Project
ERR	Economic Rate of Return
FAD	Finance and Administrative Division
GBLADP	Gash Barka Livestock and Agricultural Development Project
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GOE	Government of Eritrea
ICARDA	International Centre of Agricultural Research in the Dry Areas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICT	Information and Communication Technology
IDP	Internally Displaced People
IPRSP	Interim Poverty Reduction Strategy Paper
LAN	Local Area Network
MLWE	Ministry of Land, Water and Environment
MOA	Ministry of Agriculture
NARI	National Agricultural Research Institute
NEPAD	New Partnership for Africa's Development
NEPFP	National Economic Policy Framework and Programme

NGO	Non-Governmental Organization
NPCO	National Programme Coordination Office
NSC	National Steering Committee
NTSC	National Technical Support Committee
NUEW	National Union of Eritrean Women
PCC	Zoba Programme Coordination Committee
PCO	Programme Coordination Office
PCRRDP	Post-Crisis Rural Recovery and Development Programme
PSD	Planning and Statistic Division
PSMU	Project Support and Management Unit
PY	Project Year
RSD	Regulatory Services Department
SEPSS	Socio-Economic and Production System Survey
UNDP	United Nations Development Project
USD	United States Dollars
VLEA	Voluntary Livestock Exclusion Area
WAN	Wide Area Network
WB	World Bank
WHHs	Woman Headed Households
ZTSC	Zoba Technical Support Committee

## MAP OF IFAD OPERATIONS IN THE COUNTRY



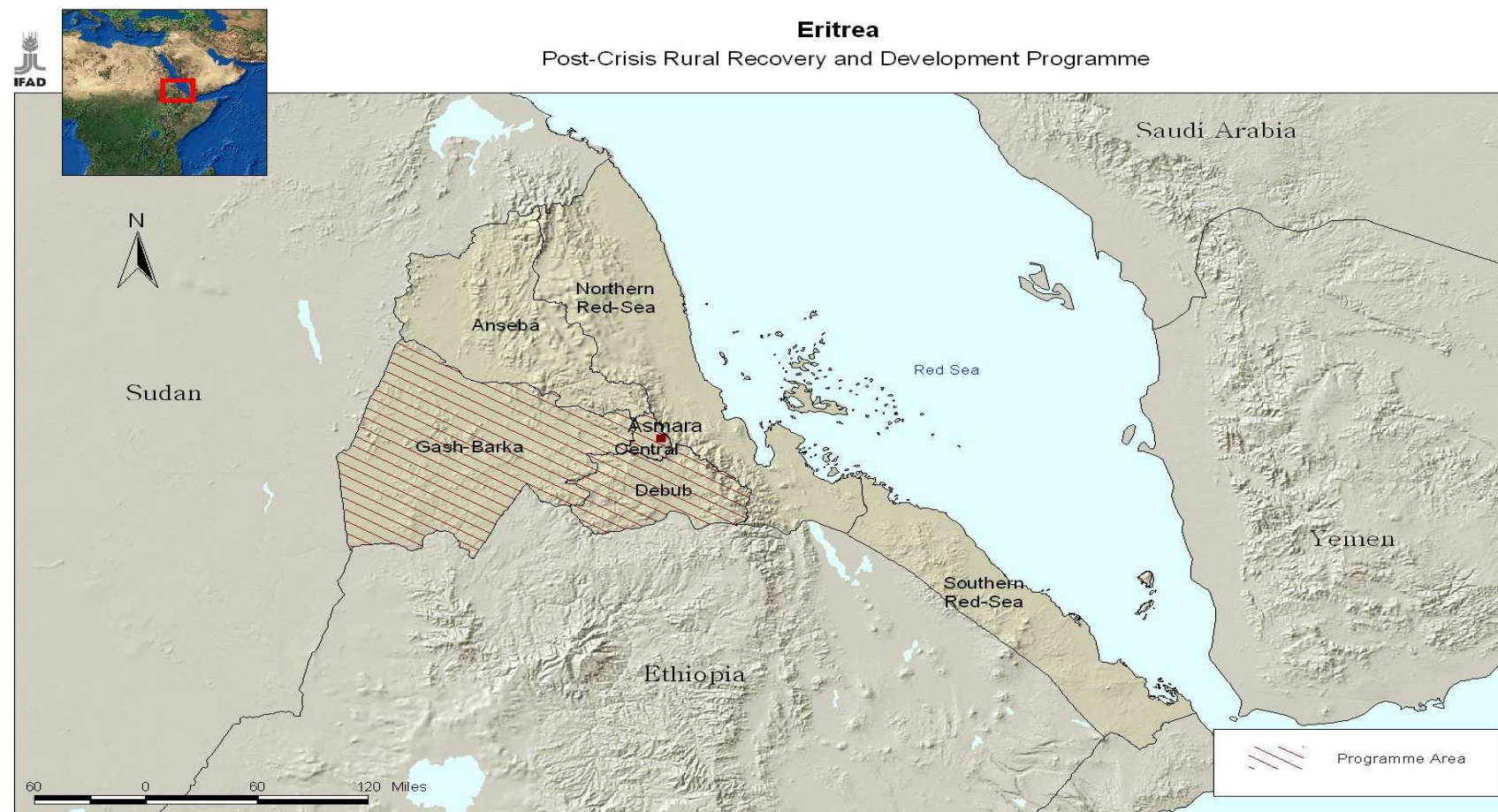
**Source:** IFAD

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






## MAP OF THE PROGRAMME AREA



Source: IFAD

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

 Other Areas



## **PROGRAMME SUMMARY**

### **Background**

In the light of the threatening global food crisis, and soaring food prices, the Government of Eritrea (GOE) requested IFAD to expand the on-going Post-Crisis Rural Recovery and Development Programme (PCRRDP) noting the good implementation capacity, and the good agricultural potentials of both districts, the poverty and food insecurity in the two regions and nationally. An IFAD mission which visited the country in February 2008 examined the government request and came to a conclusion that capacity exists to implement additional agricultural initiatives which will further contribute to the food security in the region and nationally. A draft proposal was submitted to IFAD in May 2008. IFAD reviewed the proposal and advised on needed improvements. An improved proposal was submitted to IFAD in July 2008. On the basis of the proposals, and further consultation with GOE and beneficiaries, IFAD produced an initial programme design for the PCRRDP – Add-on Programme in September 2008. The initial design report was submitted to the Government of Eritrea, and European Community, a potential co-financier, in September 2008. An IFAD mission which visited Eritrea in November 2008, reviewed the proposals with the GOE and EC. Both the GOE and EC expressed satisfaction with the programme design and provided comments and guidance to finalize the programme design. A revised final programme design document which responds to the comments and guidelines provided was produced by IFAD in January 2009. The OSC approved a supplementary financing of USD 8 million in June 2009. A final discussion of the draft report was held with GOE in August 2009. A final design document was produced by IFAD in August 2009.

### **The Country, Economy and Sectoral Context**

The Country, Economy and sectoral context have remained basically unchanged from the situation reported in PCRRDP appraisal report. The Appraisal report for PCRRDP therefore remained a reference document in this regard. However, the poor rainfall of 2008 has caused deterioration in the food supply situation in the country. The poor agricultural output has been further compounded by the global food crisis and soaring food prices. The prices of basic grains (sorghum, pearl millet, sesame, wheat and barley) have risen in 2008/2009 by 19-26%, vegetables by 16-25.9%, and eggs, milk and butter by 17%. The livestock prices on the other hand have shown a mixed trend which indicates that the poor rural households have increased their sales of livestock to meet their family food needs. The food shortage and the attendant soaring food prices are adversely affecting the vulnerable groups who have started depleting their assets.

### **IFAD Strategy and Country Programme**

The COSOP approved in 2006, defines a strategy for IFAD, aiming to add value to the government's policies and programmes in rural poverty reduction. The strategy reflects the challenges of dealing with acute rural poverty in a crisis-affected country that is threatened with severe environmental degradation and limited fiscal resources but with commitment to self-determination to address poverty and food insecurity. The COSOP, has identified opportunities in sustainable natural resource management emphasizing watershed management in the highlands to reduce erosion which is responsible for soil losses, and dam siltation; low-cost smallscale irrigation development using reservoirs, dams and spate irrigation in the central highlands and lowlands of west and east; forestry and agro-forestry to provide fuel wood, increase fodder for livestock, and reduce erosion; fodder/forage improvement to raise livestock productivity and alleviate overgrazing.

IFAD's strategic objectives are tied to the four pillars of Interim PRS. IFAD's crisis prevention and recovery policy is reflected in the first two programme assistance (the Eastern Lowlands Wadi Development Project, and Gash Barka Livestock and Agricultural Development Project) which focused on re-establishment of independent livelihoods for crisis-affected (Drought/War) rural households, and tied to IPRS pillar-reinvigoration of economic growth. The PCRRDP approved in December 2006, initiated the process of sustainable agricultural and livestock development through the introduction of productivity enhancing technology, improvement of natural resource management, and capacity building at all levels to support community driven development initiatives. The

Programme also, responds to the three remaining pillars of Interim PRS namely: creating income – generating opportunities for the poor; improvement of human resource development; and creating enabling environment and institutional capacity-building.

In order to expand outreach to the target group, IFAD strategy includes collaboration with other development partners including UNDP, GEF, EC, World Bank, AfDB, bilateral donors, the private sector and NGOs. Major partners in the proposed Add-on Programme are: the EC which may co-finance the proposed Programme through its Special Assistance to respond to souring food prices; EC and Italian government supporting up-stream irrigation development; International Centre of Agricultural Research in the Dry Areas (ICARDA) and National Agricultural Research Institute that will provide technical support in technology generation, seed production and processing; UNDP, GEF and Norway which will collaborate in natural resource management; and enhancement of participation of private sector including farmers groups that will engage in seed production, processing, storage and marketing; and agricultural and livestock production.

**Country Programme Approach.** The proposed Add-on Programme will build on the policy, institutional and strategic approach which have been established, tested and found to be working in the ELWDP, GBLADP and PCRRDP. Considerable efforts have been devoted to establishing a sustainable smallholder agricultural development system which will provide a base for future development thrust for the Fund and other development partners in Eritrea. IFAD has strengthened the decentralized system of planning, implementing and monitoring/evaluation and complemented it with a coordination arrangement at the national level to ensure operation within a sound national policy and institutional framework. IFAD's projects/programmes have been implemented within this framework which other development partners are expected to adopt. The Add-on Programme will assist to initiate a seed production system which other development partners can build-upon to make certified seeds available nationally to smallholders. The system builds on a pilot seed development programme which NARI has been operating in the past 5 years in collaboration with ICARDA, and IFAD's support to forage and grass seed production under PCRRDP. In addition, an input supply and financing system which has been in operation will be improved through strengthening its policies and strategy base to enhance sustainability.

### **Justification for Additional Support**

The activities to be supported will enhance the development objectives of PCRRDP including the raising of smallholder agricultural productivity and production on a sustainable basis, improvement of the effectiveness of basic agricultural support services, and environmental conservation. The drought of 2008 led to the loss of seed stocks by most farmers, and a general reduction of agricultural outputs which was further compounded by the global food shortage. The additional financing will make it possible to provide much needed production inputs that can within a short time permit increased food production to respond to shortage of production and the global food shortage and soaring food prices.

The proposed additional financing has attracted interest from other development partners-EU, UNDP, FAO and Oxfarm that have provided input supply using government institutions which have been strengthened by past IFAD assistance. This complimentary assistance is creating the basis for improved policy harmonization and resource use.

Smallholders are responsive to market forces however, their production efforts are constrained by inadequate access to improved inputs particularly water, seeds and fertilizers. Measures which will address these constraints coupled with positive market signals will complement ongoing development initiatives under PCRRDP, and elicit appropriate supply response from smallholders. This will impact positively on local food production which will cushion the effects of global food shortage and soaring food prices.

### **Programme Goal, Objectives, Area and Target Group**

The **Goal** remains the same with PCRRDP, i.e. to improve food security and contribute to alleviation of rural poverty. The **Objective** will compliment the PCRRDP objective by ameliorating the impact

of global food crisis and soaring food prices through accelerating agricultural and livestock production by improving access by smallholders to yield enhancing inputs –crop water, certified seeds, organic and inorganic fertilizers, and agro-chemicals. The key outputs and impact indicators and results monitoring framework are shown in Annex I.

**Programme Area.** The Add-on Programme will operate in zoba Debub and zoba Gash Barka which are also the area of operation of PCRRDP. The two zobas border Ethiopia and suffered extensively from the border conflicts of 1998-2000. The area also accommodated the highest number of Internally Displaced People (IDP), expellees, returnees and demobilized soldiers. Resettled households in the project area have been estimated at 30,000. The drought of 2000-2003 further compounded the problems of the population. Most rural households with livestock have to sell their animals to buy food and a good number of the animals also died due to feed and water shortages. The government with the collaboration of development partners has provided support in the last nine years, to reestablish the operation of poor rural households and resuscitate the government institutions for administration and technical support services. Both zobas have high concentration of poor households, problems of land degradation, and high population of woman headed households ranging from 30-40% of the population reflecting the devastating effects of the border conflicts.

**The Target Group** will also be as defined under PCRRDP. The add-on will increase support to them and expand the outreach to poor households particularly to WHHs. The poor rural households will be assisted to improve their income and food security by facilitating their access to additional land in irrigation (spate and small scale irrigation) schemes; providing them opportunities to own livestock; backyard poultry, smallstock, and small dairy units supported by the Programme; enhancement of their technical capability through training and extension services; and facilitating their access to production inputs particularly certified seeds, manure and fertilizers.

### **Description of Add-on Activities**

The proposed additional financing will expand activities of two components of PCRRDP namely; Agriculture and Livestock Development; and Institution Strengthening.

#### ***Component 1 – Agriculture and Livestock Development***

**Agriculture.** Additional assistance will include the following: Expansion of Seed Production and Distribution; increasing the area under irrigation- spate and small-scale schemes and improving the efficiency of water use to raise productivity; and provision of fertilizer and agro-chemicals. The seed production will be enhanced through equipping the tissue culture laboratory, and construction of a green house; rehabilitation of two stores for the storing and germination of potato seeds; enhancing the capacity of NARI to produce breeder and foundation seeds; strengthening of APDD to supervise the production of certified seeds through outgrowers; and improvement of seed processing facilities. The Agricultural Divisions of the two participating Zobas will also be strengthened to organize and technically support outgrowers for the production of certified seeds. A seed development committee including representatives of smallholders will be established to provide oversight for the development of a sustainable seed development system. The proposed additional financing will permit the provision of 2,993 tonnes of certified seeds comprising about 2,554 tonnes of grains and pulses, 441 tonnes of seed potato, and 0.747 tonnes of vegetable seeds. In addition 66,000 banana suckers will be distributed. A revolving fund will be established to ensure sustainability post project period.

**Irrigation Development Assistance** will be provided to improve management on 1,250 ha of existing smallscale irrigation schemes, develop about 450 ha of smallscale irrigation, and about 2,000 ha of spate irrigation. About 11,000 ha of **rainfed crops** will also receive seeds, fertilizers and chemicals. Agricultural input supply for the above development will include the provision of 4,790 tonnes of fertilizers comprising 1,723 tonnes of Urea, 3028 tonnes of DAP, and 39 tonnes of potash; and provision of about 1.5 tonnes of chemical – fungicides and insecticides for use in the production of fruits and vegetable. The main crops to be supported under rainfed and spate irrigation are sorghum, pearl millet, finger millet, wheat, barley and maize. In the smallscale irrigation areas, fruits and vegetables will be supported and include tomatoes, potatoes, pepper, onions, leafy vegetable, banana and citrus.

**Livestock.** Activities will expand communal range development, small dairy development, backyard poultry and animal health services. Range development will include establishment of 11,300 ha of permanent closure, 9,000 ha of temporary closures, and 35,000 ha of Voluntary Livestock Exclusion Areas (VLEA). The users will organize themselves for development and management. They will provide labour and materials for development and operation. They will assume operations and maintenance to ensure sustainability. The programme will provide grass and forage seed for oversowing, training, and technical support. Small dairy development include the establishment of 228 dairy units each supplied with one in-calf heifer/cow, training of producers, and support by extension officers, establishment of two milk processing/ marketing centres; and organization of two dairy cooperative to self-manage the centres. Backyard poultry will cover establishment of two breeding centres for the production of pullets for supply to producers, provision of 5 point of lay pullets and 2 cocks to each participating rural household. This number will grow to 25-30 birds within 3 years of start-up. About 6,000 WHH will be covered. Strengthening of animal health services includes the provision of drugs and vaccines, improving the facilities of the National Veterinary Laboratory to produce vaccines to control 5 key diseases- Anthrax, Black leg, Pastolosis, Brucella abortus and New Castle, improvement of storage facilities in 14 clinics, and support to the development of Community Animal Health Workers Services. A revolving fund will be established to ensure sustainability.

### ***Component 2 – Institution Strengthening***

This includes the following: Development of Information and Communication Technology system for effective coordination of agricultural sector development initiatives, knowledge management and dissemination, and collection and sharing of market information. The staff will also be trained in hardware and software management, and general computer applications.

### **Organization and Management**

The overall management of the PCRRDP and the Add-on Programme will be entrusted to the Ministry of Agriculture under the direct supervision of the Minister of Agriculture. The implementation at the regional level will be entrusted to the Zoba (regional) Administration with the Executive Governor assuming direct responsibility. A Programme Coordination Office (PCO) which has been established in each of the two participating zobas (Gash Barka and Debub), for programme planning, coordination and monitoring/ evaluation of PCRRDP will also perform the same functions for the PCRRDP Add-On Programme. The PCO is headed by a full-time coordinator appointed by the GOE and acceptable to IFAD.

The oversight responsibility for ensuring that add-on activities are implemented within the national policy and strategy has been entrusted to a National Steering Committee (NSC), and Zoba Programme Coordination Committees (PCC) at the respective zoba level. Technical oversight is through the National Technical Support Committee, and the Zoba Technical Support Committee (ZTSC) in each of the participating zobas. The National Steering Committee is chaired by the Minister of Agriculture and comprises of the Minister of Land, Water and Environment, Governors of participating zobas, the Director-Generals of APDD, RSD of MOA, the Director-General of the Department of Environment of MLWE. The Director of PSD of MOA is the Secretary. The ZPCC is chaired by the Governor and comprises the Directors of Zoba Departments and head of Zoba Agricultural Division. The Zoba Programme Coordinator is the Secretary. These committees have been properly constituted and functioning.

### **Gender sensitivity**

Experience from past IFAD operations in Eritrea has shown that the cultures and traditions of a number of the ethnic groups within the programme area favour having separate organizations and training for women. These traditions will be respected when developing the Programme's community level capacity building activities. Where there are no cultural/traditional limitation on joint operations by both men and women, the Programme will ensure that women are adequately represented, and have equal opportunities to hold decision making posts. The timing and where the training is

conducted can also negatively affect women's participation, hence such constraints will also be taken into account. Poor representation of women in programme development committees can negatively affect the access that women have to programme supported investments; for this reason the Programme will promote adequate representation of women in the various committees and decision-making bodies involved in programme implementation. The NUEW has proved useful in mobilizing rural women and fostering their interest under the IFAD GBLADP, hence its good offices will be drawn on by the Programme. The organization's presence at *kebab* level and its political activism are positive attributes that the Programme can utilise. The Programme will seek to engage the services of other NGOs, as may be needed, particularly those already working in the programme area. The government has initiated a program to strengthen extension services by providing frontline extension staff, and has assured that women will be given equal opportunities to serve as frontline extension officers. Other appointments under the Programme will also give equal opportunities to women. In spate and smallscale irrigation schemes, WHHs will have equal access to land. The smallscale dairy will give preference to women while the backyard poultry is exclusively designed for operation by women.

### **Programme Benefits and Beneficiary**

The Add-on Programme is expected to result in major benefits including significant increase in agricultural and livestock production and productivity, improvement of rural household income, and institution strengthening. By PY<sub>4</sub>, incremental annual food production is estimated to reach 48,800 tonnes of grains, 59,900 tonnes of fruits and vegetables, 1.2 million litres of milk, and 3.3million unit chickens. Grass and forage production will reach 739,300 tonnes. Increase in household income will depend on the enterprises selected. The financial returns of sample enterprises and farm models show significant improvement in household incomes. The expansion of production of fruits and vegetables, increased production of milk, and a wide promotion of backyard poultry will have positive impact on rural household nutrition. As a result of Project Initiative, over 50% of smallholders in the programme area will have access to certified and improved seeds/planting material. This is expected to give at least 20-30% increase in yield. The increased production of food will enhance household and national food security, and impact positively on national food shortage and soaring food prices. The ERR has been estimated at 20%. It is estimated that about 34,150 households including about 16,450 WHHs will directly benefit from the Add-on Programme in agriculture and livestock. They will have improved access to agriculture and livestock inputs which will increase the yields of crop and livestock.

### **Risks, Analysis and Mitigants**

The main risks for the Programme are related to the insecurity in the south of the country. A narrow stretch of the proposed programme area is within the Temporary Security Zone adjacent to the Ethiopian border. There will need to be a reduction of tension in order to allow implementation of the Programme in this area. Capacity constraints at all levels of Government, and civil society may impose constraints on programme implementation. This constraint will be mitigated through the strengthening of MOA, the Zoba Administration and the communities. Eritrea is prone to drought and erratic rainfalls. This will affect agricultural and livestock production drastically when they occur. To ameliorate the risk, the Programme will expand irrigation, promote drought tolerant varieties; and support improved range management and expand watering points for livestock. In addition, strategies will be developed to improve the resilience of poor rural households to drought and poor rainfall through the promotion of household storage and encouragement of village food banks.

### **Sustainability and Replicability**

IFAD experience in Eritrea has demonstrated that successful implementation and sustainability of development programmes are likely if the interventions respond to the beneficiaries priorities, actively involve them in planning and implementation, and utilize their traditional organizational/institutional structures. The activities promoted by PCRRDP and its proposed Add-on will respond to the needs of beneficiaries and are likely to be sustained and replicated. Eritrea being a drought prone country, agriculture and livestock development is highly dependent on improving the availability of water,

improved range management, and generation and dissemination of affordable technologies which are resilient in drought conditions. PCRRDP interventions include irrigation development, improved range management, provision of livestock watering points, soil and water conservation, and promotion of drought resilient technologies. These measures which respond to the needs of communities and beneficiaries, have received enthusiastic responses and a high level of support by the beneficiaries in ELWDP and GBLADP. The Add-on programme will expand these measures, and build-on and deepen the participatory development approach which has been established by past IFAD programmes. The ELWDP which has closed has been sustained by the beneficiaries and GOE, while the ongoing GBLADP has witnessed the replication by communities, of certain initiatives, e.g. VLEA promoted by the project.

The production of certified seeds and planting materials has hitherto been ad-hoc. The PCRRDP and its Add-on will institutionalize the production of seeds and planting materials. The system will respond to the varieties and type of seeds demanded by smallholders and they will be fully involved in production and management. Further, the financing arrangements for agricultural inputs including seed will include the establishment of viable revolving funds to ensure sustainability. Policies that will ensure sustainability and promote private sector initiatives will be supported. They include: market-based pricing for inputs and outputs, cost recovery system for smallscale irrigation, creation of revolving funds for sustained financing of inputs, encouraging commercial production of seeds/planting material particularly for certified/improved composites.

### **Costs and Financing**

The consolidated total financing package for PCRRDP inclusive of add-on grants totals to USD 43.3 million, with the funding sources as follows: IFAD original Loan – USD 12.245 (28.27% of total costs), IFAD original grant – USD 0.343 (0.79% of total costs), IFAD PCRRDP Add-on grant – USD 8 million (18.47% of total Costs), EC grant – 5.439 million (12.56% of total costs); GEF grant – 4.35 million (10.04% of total costs), GOE – 5.305 million (12.25% of total costs) and beneficiary contribution – 7.631 million (17.62%). IFAD in total through the original loans and the two grants will be contributing a total of USD 20.588 or 48% of total costs. The PCRRDP Consolidated Financing Plan by expenditure category is summarized below:



Post Crisis Rural Recovery and Development Programme  
Consolidated Financing Plan by Expenditure Categories  
USD ('000)

	IFAD Loan	IFAD Grant	IFAD DSG	IFAD Total	EC	GEF	GOE	Beneficiaries	Total USD	%
<b>I. Investment Costs</b>										
A. Civil Works	1,408	-	4,865	6,273	-	-	961	834	8,067	18.63
<b>C. Equipment and Goods</b>										
Computers	214	-	-	214	-	-	11	-	225	0.52
Other Equipment and Materials	543	-	1,466	2,009	602	3,269	1,807	-	7,687	17.75
<b>Subtotal</b>	757	-	1,466	2,222		3,269	1,818	-	7,310	16.88
D. Livestock input	2,909	-	113	3,022	543	-	73	2,221	5,858	13.53
E. Agricultural Inputs	1,061	-	783	1,845	3,756	-	800	218	6,618	15.28
<b>F. Vehicles</b>										
Four Wheel Drive	723	-	-	723	191	40	156	-	1,111	2.57
Motorcycle	169	-	-	169	-	-	23	-	192	0.44
<b>Subtotal</b>	893	-	-	893	191	40	179	-	1,303	3.01
<b>G. Technical Assistance</b>										
International Technical Assistance	45	167	258	470	254	61	37	-	822	1.90
National Technical Assistance	-	74	-	74	-	355	60	-	488	1.13
<b>Subtotal</b>	45	240	258	544	254	415	97	-	1,310	3.03
<b>H. Research Grants</b>	-	-	-	-	-	123	30	-	153	0.35
<b>I. Casula Labour</b>	-	-	-	-	-	-	604	4,359	4,963	11.46
H. Training, Studies, Workshops	1,767	103	510	2,379		220	284	-	2,883	6.66
<b>Total Investment Costs</b>	8,839	343	7,995	17,178	4,743	4,067	4,847	7,631	38,466	88.81
<b>II. Recurrent Costs</b>										
<b>A. Salaries and Allowances</b>										
Salaries	1,194	-	-	1,194	-	208	307	-	1,709	3.95
Allowances	418	-	-	418	57	-	-	-	476	1.10
<b>Subtotal</b>	1,612	-		1,612	57	208	307	-	2,185	5.04
B. Operation and Maintenance	684	-	5	689	37	50	150	-	926	2.14
C. Other Operating Costs	1,109	-	-	1,109	-	25	-	-	1,134	2.62
<b>Total Recurrent Costs</b>	3,405	-	5	3,410	37	283	458	-	4,188	9.67
	12,245	343	8,000	20,588	5,439	4,350	5,305	7,631	43,313	100.00
% of Total	28.27	0.79	18.47	47.53	12.56	10.04	12.25	17.62	100.00	



## **THE STATE OF ERITREA**

### **POST-CRISIS RURAL RECOVERY AND DEVELOPMENT PROGRAMME (PCRRDP)**

#### **ADD-ON PROGRAMME**

#### **PROGRAMME DESIGN REPORT**

### **INTRODUCTION**

1. The Post-Crisis Rural Recovery and Development Programme (PCRRDP) covers Zoba Gash Barka and Zoba Debub, the two zobas which suffered the most during the Ethiopia-Eritrea crisis. The Programme was approved by the Executive Board in December 2006. The Financing Agreement was signed on 15 December 2006, and was declared effective in November, 2007. The programme became operational in January 2008. PCRRDP is the first GOE experience of implementing a multi-zoba agricultural development Programme under a decentralized system of administration. Thus, some difficulties were experienced at the start of the Programme. The Government has taken necessary steps and has shown commitments to effectively implement the Programme. The last supervision mission by IFAD, in July/ August 2009, confirmed effective implementation, building on the experiences and institutional framework of Gash Barka Livestock and Agricultural Development Project. The actual disbursements and commitments as of 30 June 2009 stood at the equivalent of USD 2.8 million or 22% of the loan which is better than the average expected. It is the mission's judgment that the Programme will be fully disbursed ahead of scheduled closing date.

2. In the light of the threatening global food crisis, and soaring food prices, the government requested IFAD to expand the Programme noting the good implementation capacity in the two regions, the good agricultural potentials of both regions, the poverty and food insecurity in the two regions and nationally. An IFAD mission which visited the country in February 2008 examined the government request and came to a conclusion that capacity exists to implement additional agricultural initiatives which will further contribute to the food security in the region and nationally. A draft proposal was submitted to IFAD in May 2008. IFAD reviewed the proposal and advised on needed improvements. An improved proposal was submitted to IFAD in July 2008. On the basis of the proposals, and further consultation with the beneficiaries and GOE, IFAD produced an initial design report for the PCRRDP – Add-on Programme in September 2008. In the meantime, EC expressed interest in assisting Eritrea to improve its agricultural production in the wake of global food crisis and soaring food prices. The draft proposal was thus submitted to EC for consideration of co-financing. An IFAD mission which visited Eritrea in November 2008 reviewed the proposals to respond to the comments of EC and GOE. OSC approved an additional funding of USD 8 million in June 2009. An updated report including the comments of OSC was discussed with GOE in July 2009. Both the GOE and EC expressed satisfaction with the programme design and provided further comments and guidance to finalise the programme design. The final programme design document which responds to the comments and guidelines provided by IFAD, EC, and GOE was produced in August 2009

3. The Add-on Programme seeks to accelerate national food production to enhance national and household food security, and ameliorate the impact of the threatening global food shortage and soaring food prices. Improved productivity and increased production will be achieved through enhanced production and distribution of improved/certified seeds and planting materials; promotion of an increased use of organic fertilizer complemented by application of inorganic fertilizer; expansion of spate and small-scale irrigation schemes for improved resilience to drought and erratic rainfall; and promotion of improved production practices including crop rotation, and soil and water conservation. The Add-on Programme will be implemented within the institutional framework already established under PCRRDP.

## **I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING**

### **A. The Country Situation, Global Food Shortage and Soaring Food Prices**

4. Eritrea is a food deficit country and one of the poorest in Africa. A combination of factors including conflict with Ethiopia, and adverse weather, especially the drought of 2000-2003 worsened Eritrea's agricultural production and caused Eritrea to depend on food imports which accounted for over 60% of the country's need in 2002 to 2004. Concerned about its dependence on food aid for survival, the country intensified its efforts to raise agricultural production and reduce food insecurity. This commitment to achieve food sufficiency complemented by IFAD assistance and good weather has shown good results in recent years. Eritrea virtually met its needs for grains in 2007. The poor rainfall experienced in 2008 however, brought the food production down to not more than half of 2007 production. Eritrea has to import a significant amount of its food needs in 2009. The prices of basic grains (sorghum, pearl millet, sesame, wheat and barley) have risen in 2008/2009 by 19-26%, vegetables by 16-25.9%, and eggs, milk and butter by 17%. The livestock prices on the other hand have shown a mixed trend which indicates that the poor rural households have increased their sales of livestock to meet their family food needs. The global food shortage and the attendant soaring food prices are adversely affecting the vulnerable groups who have started depleting their assets. Additional financing is urgently required to respond to emerging problems of food production. The keys to addressing the problem are to quickly provide production inputs particularly seeds of key food crops, as most farmers have lost their seeds as a result of poor rainfall in 2008, expanding livestock production through enhancing small-stock and backyard poultry production, and improvement of animal health services as livestock provide a central coping strategy for rural households, expansion of irrigation command areas; and improvement of efficiency of water use in irrigation schemes.

### **B. Country Programme Management**

5. Eritrea, despite the crisis and the attendant resource constraint has effectively implemented IFAD's assisted programmes. IFAD has supported three programmes. The first project, Eastern Lowlands Wadi Development Project (closed 30 June 2006), implemented at the height of crisis (the border conflict 1998-2000), met its target and disbursed over 95% of the loan, all be it, at a longer implementation period which is related to the years of war when implementation was minimal. The quick impact assessment carried out by PF in November 2008 showed that not only are programme supported facilities functioning, they have been expanded and improved upon. The second project, Gash Barka Livestock and Agricultural Development Project, has also surpassed its agricultural targets and beneficiary outreach including women. The IFAD-financed agricultural part will be fully disbursed by the scheduled closing date (30 September 2009). The PCRRDP comprises of three components namely; (i) Capacity Building and Institution Strengthening; (ii) Livestock and Agriculture Development; and (iii) Natural Resource Management. It was approved in December 2006, and became effective in October 2007, suffered a slow start-up as a result of policy adjustment delinking rural development activities from agricultural development, to fast track agricultural development and to enhance food security. The institutional reorganisation following the policy change has been completed and implementation is assuming increasing tempo. It is the judgment of the last supervision mission, that the Programme will be fully disbursed ahead of closing date. The country has a zero-tolerance for corruption.

### **C. Justification for Additional Support**

6. The activities to be supported will enhance the development objectives of PCRRDP including the raising of smallholder agricultural productivity and production on a sustainable basis, improvement of the effectiveness of basic agricultural support services, and environmental conservation. The up-scaling of targets will not affect the consistency of PCRRDP with COSOP strategic objectives, in particular: productivity improvement, capacity building, and environmental conservation. At the design stage of PCRRDP, IFAD was aware of the needs for yield enhancing inputs in particular seeds/planting materials and fertilizers, and included the production of seeds for

grass and forage crops as a priority noting the importance of livestock and the devastation of the environment caused by overgrazing. Inadequate resources precluded the provision of seeds for key food crops, fertilizers and chemicals. The drought of 2008 led to the loss of seed stocks by most farmers, and a general reduction of agricultural outputs which was further compounded by the global food shortage. These unexpected phenomena persuaded PF to respond to the GOE's request for additional support through PCRRDP. PF also considered the possibility of addressing the request in its next project but realized that such a response will cause a 3-4 year delay to respond to a need which is very urgent. The additional financing will make it possible to provide much needed production inputs that can within a short time permit increased food production to respond to shortage of production and the global food shortage and soaring food prices.

7. The additional financing will not change the development objectives nor the component coverage. The programme area and the target group will remain the same as PCRRDP. The implementation arrangements will be as under the present arrangement for PCRRDP. The additional financing will permit the provision of seeds for key food crops (sorghum, millet, potato, wheat, barley and vegetables), fertilizers and chemicals; expansion of command area of spate irrigation to make better use of past investment in head-works and improvement and expansion of small-scale irrigation particularly for fruits and vegetables. The additional support to livestock is to enhance animal health facilities to raise productivity and facilitate regional market penetration; and expansion of small-stock/ and backyard poultry production for women, landless/ near landless households to improve their resilience to drought and poor rainfall. In respect of capacity building, the additional financing will permit improvement of the base for technology generation by collaboration with key international research institutes- ICARDA, CIMMYT, ICRISAT, and CIP; and generation and dissemination of technical and market information.

8. The proposed additional financing has attracted interest from other development partners-EU, UNDP, FAO and Oxfam that have provided input supply using government institutions which have been strengthened by past IFAD assistance. This complimentary assistance is creating the basis for improved policy harmonization and resource use.

9. The government has demonstrated its commitments to food self-sufficiency and rural poverty alleviation, through intensification of smallholder agriculture. The support of the proposed PCRRDP – Add-on Programme including the initiation of a suitable seed system for sustained supply of basic food crop seeds; promotion of the use of improved inputs – fertilizers and manure for enhancement of productivity; improved crop water supply; enhancement of range management and animal health services to raise livestock productivity and enhance export to the regional market; and policy support to promote private sector initiative will enhance sustainable food production and ameliorate the threatening food crisis and soaring food prices in Eritrea.

10. Smallholders are responsive to market forces however, their production efforts are constrained by inadequate access to improved inputs particularly water, seeds and fertilizers. Measures which will address these constraints coupled with positive market signals will complement ongoing development initiatives under PCRRDP, and elicit appropriate supply response from smallholders. This will impact positively on local food production which will cushion the effects of global food shortage and soaring food prices.

## **II. COUNTRY, RURAL POVERTY AND SECTORAL CONTEXT**

11. The Country situation, rural poverty and sectoral context have not changed from the situation as presented in the PCRRDP appraisal document which constitutes a reference document for the proposed supplementary financing.

### III. DESCRIPTION OF ADD-ON ACTIONS

12. **Goal, Objective and Target Group:** The proposed supplementary financing will not affect the goal of the Programme. The basic objective of the Programme will also remain the same. However, a complimentary objective is proposed: to accelerate agricultural and livestock production through improved access by smallholders to yield enhancing inputs including certified seeds, fertilizers, organic manure, water and agro-chemicals. The target group and programme area will also remain unchanged. The Programme will maintain its consistency with IFAD strategy for support to Eritrea.

13. The proposed additional financing will (a) expand support to agriculture and livestock development component of PCRRDP; and (b) enhance information and communication technology to collect and disseminate production and market information. Supplementary activities to the PCRRDP components to be supported by the additional financing are described below:

#### *Component 1: Agriculture and livestock development*

14. Support aims to raise productivity and increase smallholder production through improved access to production inputs – seeds, fertilizers, agro-chemicals, organic fertilizers, veterinary drugs and vaccines; expansion of cropped areas under irrigation and rain-fed; promotion of small scale livestock activities including small-scale dairy, backyard extensive poultry operation mainly for women; and improvement of animal health services.

#### **(a) Agricultural support**

15. Support will be provided to expand seed production of key crops to complement the support already provided for grass and forage seed production under PCRRDP; supply of fertilizers and agro-chemicals, irrigation development, intensification of rain-fed and capacity improvement to develop technology that is more resilient to drought and poor rainfall.

#### **Seed Production and Distribution**

16. At the moment, smallholder farmers rely mainly on retained seeds from their production. Such seeds are of poor quality due to loss of vigour as a result of long use and failure to select, treat and store appropriately. Less than 10% of cropped areas use improved seeds and a lesser proportion use certified seeds. The use of certified/improved seeds, fertilizers and manures coupled with improved practices will permit an increase in yield of between 100-150% on irrigated plots, and at least 50 - 100% in rainfed agriculture in medium-high rainfall areas. It has also been confirmed that with improved water management, and the use of good seeds, yield can increase by 20-30%. Composite seeds which are acceptable to farmers will be promoted. Key characteristics will include market acceptability, drought tolerance and disease/pest resistance. The following crops will be covered under rainfed and spate irrigation. Sorghum, pearl millet, maize, potato, wheat, barley, chick pea, lentil/faba bean, and sesame. In addition, the production of certified seeds of fruits and vegetables will be promoted for use in small scale irrigation schemes. The main crops are: tomato, pepper, cabbage, lettuce, Swiss chard, onion, citrus and banana. The materials for the former set of crops will be based on tested imported and local varieties which have been selected by NARI and found acceptable to farmers. The materials for the latter set of crops (fruits/vegetables) will be based on importation of foundation seeds of varieties which have been in use and acceptable to farmers. The existing two seed processing plants will be improved and staff trained for effective processing and handling of seed. In addition, the tissue culture laboratory in National Agricultural Research Institute (NARI) will be improved and a green house built to support the development of pre-basic and basic potato seed and other seeds particularly fruits and vegetables. NARI will have the responsibility for producing breeder and foundation seeds while, the certified seeds will be produced by outgrowers under the supervision of Agricultural Production and Development Department (APDD) of MOA.

17. The National Agricultural Research Institute (NARI) has confirmed availability of materials as follows: For Debub: 2 bread wheat varieties, 3 barley varieties, 2 sorghum varieties, and 2 maize varieties; and for Gash Barka: 4 sorghum varieties, 2 pearl millet varieties, and one sesame variety. For potatoes, four varieties grown nationally namely: Tsaeda embaba, cosmos, Ajiba, and Spunta will be used. The vegetable seeds that will be imported and multiplied are: Tomatoes: san morzano lunga, rio grande and money maker; pepper – marco fana and extra long; onion – hagaz, red creole; cabbage – early drum head, and Copenhagen market; lettuce – bioda and salad; and Swiss chard – Forel hook giant, and argentata. For legumes (chick peas, faba bean, and lentil), existing varieties which have shown adaptability to different ecological regions will be cleaned-up, reassessed and multiplied for distribution to farmers to replace their old seeds which have degenerated. Total coverage will be 2,249.22 ha comprising 7.62 ha breeder seed, 113.3 ha foundation seed, 2,128.3 ha certified seed.

18. In order to initiate the production of high quality and disease free potato and vegetable seeds locally, the government has sought external assistance to establish tissue culture laboratory and a green house to produce the nuclear stock of pathogen free in-vitro plantlets needed for pre-basic and basic seed. Through an FAO assistance, a tissue culture laboratory was established in 2005. The Syngenta Foundation for Sustainable Agriculture has assisted in partially equipping the laboratory. No suitable green house has been established. With existing facility, NARI has initiated the production of virus-free in-vitro potato plantlets of acceptable varieties – cosmos, Tsaeda embaba, Ajiba and Spunta. The multiplication of these potato varieties and the development of other crops particularly fruits and vegetables, will require a better equipping of the tissue culture laboratory, the construction of a suitable green house, and training of staff. The proposed PCRRDP – Add-on Programme will address these needs.

19. In order to sustain the effort of seed development, the proposed additional financing will be used to initiate the development of a national seed system. For a rapid introduction of improved seed varieties, the NARI-ICARDA/CIMMYT collaboration will be expanded to include ICRISAT and CIP to facilitate a wider coverage of staple food crops- sorghum, pearl millet and potatoes. The area coverage for seed production is shown in Table 1 below.

**Table 1: Target Production in ha over Project Life**

Crop	Hectares			Total
	Breeder Seed	Foundati on Seed	Certified Seed	
Sorghum	0.20	10.00	750.00	760.20
Pear Millet	0.20	5.00	250.00	255.20
Maize	0.20	10.00	216.00	226.20
Sesame	0.20	1.30	60.00	61.50
Tomato	-	-	40.00	40.00
Onion	-	-	40.00	40.00
Potato	-	12.00	50.30	62.30
Bread wheat	2.00	27.00	300.00	329.00
Barley	2.00	27.00	300.00	329.00
Chick pea	2.00	16.00	42.00	60.00
Lentil/ Faba bean	1.00	5.00	80.00	86.00
<b>Total</b>	<b>7.80</b>	<b>113.30</b>	<b>2,128.30</b>	<b>2,249.40</b>

20. The existing system of seed development has not been structured for orderly development. There is a need for an institutional arrangement to coordinate the production of breeder, foundation and certified seed; and set-up a system for the flushing out of the deteriorated seeds. The Programme has therefore included the institutional arrangements for an orderly seed supply. The system takes cognizance of the government plan to commercialize the seed supply operation excluding the production of breeder and foundation seeds which will be managed by NARI. **NARI** has been

strengthened to produce the breeder and foundation seed. The support included improved infrastructural base, and provision of staff, equipment and materials for the production of breeder and foundation seed. In addition, formal and informal training of staff will be provided. The capacity of **APDD** and the Zoba Agricultural Division will be strengthened to organize and supervise the production of certified seeds by outgrowers. The APDD will be strengthened by three experts to oversee the seed production nationally. In addition, two graduate staff will be provided opportunity to undertake M.Sc courses in horticultural crops and grains, preferably in a regional institution e.g. in Kenya/ or South Africa. **RSD** will also be strengthened through the provision of graduate training for a staff in seed quality assurance and certification. APDD and RSD will each have a 4-wheel drive for field supervision. Equipment and materials have also been provided. A **seed production committee** involving staff from the Zoba, APDD, RSD, NARI, and farmers representatives will be established to oversee the development of the system. Resources have been provided for Monitoring and supervision of the system.

21. A total of 2,595 tonnes of certified seeds is estimated for production and will include 2,174 tonnes of grains and pulses and 421 tonnes of seed potatoes. Before the take-off of the seed production programme, certified seeds will have to be procured in PY<sub>1</sub>. It has been estimated that a total of 746.3 kg of certified vegetable seeds (onions, tomatoes, pepper, cabbage, lettuce and Swiss chard); 20 tonnes of potatoes and about 377.5 tonnes of grains/pulses seed (sorghum, maize, pearl millet, finger millet, wheat, barley and chick pea) will be procured. Thus, the total seed that will be distributed by the add-on programme will be about 2,993 tonnes. In addition, 66,000 banana suckers will be distributed. The summary by crops and source of supplies are shown in the table 2 below.

**Table 2: Estimated Certified Seed Supply by the Add-on Programme**

	<b>Production (Tons)</b>	<b>Imported PY1 (Kg)</b>
<b>Grains/ Pulses</b>		
Sorghum	760.0	48,000.0
Pearl Millet	86.4	22,500.0
Maize	407.2	45,000.0
Sesame	49.0	-
Bread wheat	427.7	120,000.0
Barley	361.9	102,000.0
Chick pea	40.8	40,000.0
Lentil/ faba bean	40.8	-
<b>Total</b>	<b>2,173.8</b>	<b>377,500.0</b>
<b>Potatoes</b>		
	<b>421.0</b>	<b>20,000.0</b>
<b>Fruits/ Vegetables</b>		
Tomato		143.8
Onion		84.0
Cabbage		124.0
Lettuce		84.0
Swiss chard		124.0
Pepper		186.5
<b>Total</b>		<b>746.3</b>

### **Input Supply**

22. In order to take maximum advantage of the use of certified seeds, the improvement and expansion of irrigation, and enhanced soil and water management in high-medium-rainfall areas, fertilizers and chemicals will be provided. In addition, the use of organic fertilizers will be promoted to improve the soil structure and enhance the impact of fertilizers. The soils in Eritrea are poor in nitrogen and phosphorus, therefore, the Programme will encourage the application of these fertilizers. The Programme has included the provision of fertilizers for seed production, irrigated crops, and a limited area of rainfed crops. A total of **4,790** tonnes of fertilizers comprising Urea: **1,723** tonnes, **3,028** tonnes of DAP, and **39** tonnes of potash will be supplied. About 1.5 tonnes of chemicals –



fungicides and insecticides will be provided for application in the production of fruits and vegetables in the irrigated areas.

23. The inputs including seed will be provided to farmers on cash or credit in kind basis and will be on real price basis plus adequate margin to ensure sustainability. The farmers obtaining seeds in in-kind basis will, for a kilogramme of certified seed provided, return 2 kilogramme of produced crop which will be processed and sold. A similar arrangement will be put in place for the other inputs, i.e. a quantity of produced crop enough to pay for the real cost of inputs supplied will be provided at harvest. The farmers receiving input on cash basis will pay full cost plus 20% mark-up. An input supply revolving fund arrangement which is in place will be strengthened using the successful experience of the animal drug revolving fund but policies and strategies will be improved.

### **Irrigation Development**

24. Smallscale irrigation development will cover about 420 ha of which 160 ha will be by pressurized system in Debub and 260ha by surface irrigation in Gash Barka. In addition, 1,984 ha of spate irrigation will be developed in Debub. Further, improved management and supply of inputs will be provided on 2,000 ha of spate irrigation and on 1,250 ha of smallscale irrigation. The crops to be produced under smallscale irrigation in Debub will include barley, bread wheat, potato, tomato, pepper, onion, lettuce, cabbage and Swiss chard. In spate irrigation areas, sorghum and maize will be the main crops. In Gash Barka, the crops to be produced in smallscale irrigation are: tomato, pepper, onions, and banana. All the spate and smallscale irrigation schemes under PCRRDP will receive certified seeds. Water Users' Association will be strengthened to assume full management of schemes. In addition, cost-recovery policy will be instituted.

25. **Rainfed crops.** Sorghum, maize, pearl millet, sesame and common beans will be supported under rainfed in Gash Barka. In Debub: sorghum, maize, barley, wheat, chick pea and lentil/faba bean will be supported. Over 11,000 ha will be covered by full package of inputs while other areas assisted under PCRRDP will obtain certified seeds.

### **(b) Livestock Development**

26. The activities to be supported will include: improvement of rangeland through the development of permanent and temporary closures of in the water shade and catchment areas, and Voluntary Livestock Exclusion Area (VLEA) in the communal rangelands; provision of supplementary feed for backyard poultry and dairy cows (backyard poultry and dairy cows will obtain 50% of their feed through natural range and 50% from supplementary feed); promotion of family-based small-scale dairy and strengthening of dairy cooperatives for effective milk collection, processing and marketing; backyard poultry production; and enhancement of animal health services. The objectives of the livestock programme are to: diversify sources of family income, improve resilience to drought and poor rainfall, enhance household food security, and improve nutrition. The activities are described below:

- (i) **Communal Range Improvement.** The main activities will include: the establishment of permanent closures covering about 11,300 ha, and temporary closures covering 9,000ha. Voluntary Livestock Exclusion Area (VLEA) covering a thousand ha per kebabi in 35 administrative kebabis giving a total of 35000ha. These facilities will be oversown with better grass and forage seeds to improve quality and quantity of biomass. Through improved management, the biomass production will reach a yield of over 25000kg per ha in permanent closures, 10,000kg in temporary closures and VLEAS, as against an existing production of 5000kg/ha. The development will replicate the approach already developed under Gash Barka and also adopted under PCRRDP. The community is responsible for identifying and demarcating the areas to be put under permanent and temporary closures, and VLEA. The management and utilization of the improved area including the period of exclusion of livestock, the period of introducing livestock in VLEA and temporary closures, the mode of harvesting of forage and grass from the permanent closures will be

the responsibility of the communities. The Programme will provide training and supply of seeds for oversowing. Ten animal watering points (hafirs) will be constructed and equipped with drinking troughs.

- (ii) **Small Dairy Development.** The Programme will supply 228 in-calf cows to 228 beneficiaries. A special breed of cattle (Hamerenya) from Sudan which has adapted to Eritrean condition, which can be raised mainly on grass/forage, and which produces milk even when pregnant will be used. Its docility makes it a good breed for women. These animals will be supplied on cash or through credit in-kind basis. For poor families who cannot pay cash for the animal, an agreement will be reached to release the first female cows (heifers) to the Programme at the age of 15 months, as payment for the cows they were supplied. The Programme will make the animals available to other families under the same system. In all cases, the operators will keep the male calves and raise them either as breeder bull for providing services to upgrade indigenous animals or sell them as breeder bulls; or castrate them and sell them at 24 months of age. Two sets of beneficiaries will be covered in the project period of six years. A total beneficiary of 456 households will be reached. By the end of the Programme, a total of 456 cows will be in production, another 114 heifers will be ready for distribution, while 342 bulls would have been sold as culls and/or kept as breeding bulls to upgrade local animals. The first set of beneficiaries will have at least two cows under production. Training will be provided to the households prior to the supply, and a condition for participation is the building of kraal and assurance of enough feeding material. A semi-intensive operation is planned to ease pressure on the range land. Necessary milking materials and equipments will be provided and health services assured. Two milk collection centres will be established. Farmers will be organized and trained for proper handling and marketing of milk. The experience in Debub has confirmed that farmers cooperative, appropriately organized and trained can effectively manage milk collection, processing and marketing centre.
- (iii) **Backyard poultry development.** This will be promoted purely as a woman enterprise. Each woman headed household or woman within the family, will receive five pullets and two cocks as initial stock. The objective is to establish an organized home-based production of poultry as an economic enterprise. The Programme will seek to exploit the brooding characteristics of the local breed, and improve their size through upgrading by cross-breeding with suitable imported breeds. Past assistance has established a hybrid population of local breed and fayoum imported from Egypt. The Programme will use these hybrids at inception as they are available in the local markets. The following will be involved:

**The organization of chick and pullet production through a group-based operation.**

Two centres will be established, one in each of the two participating zobas (Gash Barka, Debub). These centres will build on a local experience from a smallholder operator in Debub who has developed a thriving commercial chick/pullet production unit. The operator has developed a small-scale incubator with a capacity of 400 eggs that hatches 400 chicks in 21 days. A breeding unit using local breeds and Fayoum hybrid has been established to produce fertile eggs; and a unit for rearing chicks to pullet stage. This arrangement will be adopted under the Programme. The following will be provided: initial breeding stocks to the centres – each centre will be provided with 50 cocks and 250 point of lay pullets/hens, two breeding units, an incubator, a pullet rearing house, and necessary materials, and equipments. Two extension officers and six producer representatives will undergo practical training for three months. In order to avoid any pressure on the centre, the training will be in two batches. After training, one extension and three producer representatives will be allocated to each centre to manage it. Initial stock of feed for the breeding operation will be provided. The first sets of beneficiaries will purchase point of lay pullets/hens, and cocks from the existing breeding centre and local markets. Subsequent supplies will be from the Programme organized breeding units.

The households will be organized into village groups and trained in extensive poultry management. Each group will nominate representatives to be trained in breeding operations and administration of health services including vaccination. Expansion of household poultry operation will be through natural brooding. Within the project period about 6,000 households, will be reached each starting with a unit of about 7 birds. Each unit is expected to stabilize with a population of 25-30 breeding hens/ cocks which can be managed effectively within the resources of poor rural households. The excess eggs, and pullets raised will be sold. A household is expected to sell at least 100 chickens/ pullets, and about 2,000 eggs per year at maturity in PY<sub>3</sub> after home consumption estimated at 600 eggs and 50 chickens. The production of eggs per hen per year under extensive system is estimated at 50 eggs per hen per year, and wastage assumed as 10% of production. Under the improved backyard management, the experience is 100 eggs per hen per year and wastage is about 5%.

- (iv) **Strengthening Animal Health Services.** Livestock productivity is hampered by inadequate feed supply and livestock watering; and attacks by pests and diseases. IFAD, over the years has been providing support to address these problems. In addition the Fund has emphasized the development of small-stock, back yard poultry, and small scale dairy among poor rural households particularly WHH and smallholder without livestock, as a coping strategy for drought and irregular rainfall. The add-on financing will emphasize improvement of animal health services to reduce mortality, raise productivity and enhance livestock export. The diagnostic capacity of the central veterinary laboratory will be strengthened, and facilities for the production of vaccines and quality control will be improved. Assistance will be provided to produce vaccines for five important diseases namely: Anthrax, black leg, Pastrelosis, Brucella abortus and New Castle. Adequate measures will be included to prevent escape of dangerous organisms in the process of vaccine production. Environmental concerns of disposing solid and liquid waste will also be addressed. Capacity enhancement of the central laboratory is also important for the diagnosis and control of zoonotic diseases such as Avian Influenza (HPA1-HPN1), Rabies and Rift Valley virus. The village based animal health support services including the use of Para-vets and Community Based Animal Health Workers (CBAHW) will be strengthened and expanded. Livestock producers will be trained in animal health services management. Vaccines and animal drugs will be provided through 14 veterinary clinics which will be better equipped to store veterinary drugs and vaccines. A revolving fund arrangement will be promoted in Debub, building on the Gash Barka experience.

### ***Component 2: Institution Strengthening***

27. The support will be for the promotion of Information and Communication Technology (ICT). Financing will be provided to enhance communication within the programme and between other agricultural programmes, and national level institutions. The objectives are to: promote knowledge management and information sharing, collect and disseminate market information; and facilitate coordination of implementation activities between the various implementation units. ICT will also facilitate linkage to outside institutions to access technical and market information. The support will include the provision of Local Area Network (LAN), and Wide Area Network (WAN), high speed internet connectivity, website service, and provision of necessary software and hardware. Training will be provided to enhance the capacity for software and hardware management, and interpretation of satellite images. A total of 50 staff will be trained including: for software and hardware maintenance (6); software designers (4); skilled computer operator/information managers (10), and general computer operators (30).

#### IV. PROGRAMME COSTS, FINANCING, PROCUREMENT AND DISBURSEMENT

##### A. Project Costs and Financing

28. **Costs.** The total costs, over six years have been estimated at USD17.66 million, and comprise a base cost of USD16.80 million or 95% of total cost; and USD 869,000 or 5% of total cost as contingencies. Foreign exchange cost is estimated at USD 5.35 million or 30% of total cost reflecting the importation of agricultural inputs viz; Fertilizers, seeds, chemical, animal drugs and vaccines, equipment, vehicles and machinery. The agricultural and livestock component accounts for USD16,297 million or 97% of base cost, and institutional support component takes USD 0.500 million or 3% of base cost. Table 3 below shows the summary cost by components. The summary cost tables are in Annex II while the details are shown in Appendix 1.

**Table 3: Summary Costs Estimate by Components (USD'000)**

COMPONENT/ SUB-COMPONENT	(Nk '000)					(USD '000)				
				%	% Total				%	% Total
	Local	Foreign	Total	Exchange	Base	Local	Foreign	Total	Exchange	Base
<b>A. Capacity building &amp; Institutions Strengthening</b>										
Programme Implementation, Monitoring & evaluation	2,250	5,250	7,500	70	3	150	350	500	70	3
<b>Subtotal Capacity building &amp; Institutions Strengthening</b>	2,250	5,250	7,500	70	3	150	350	500	70	3
<b>B. Livestock and Agricultural Development</b>										
Animal Feed & Water Supply	15,803	12,998	28,800	45	11	1,054	867	1,920	45	11
Livestock Development	23,066	21,714	44,779	48	18	1,553	1,448	3,000	48	18
Agricultural Production	133,460	37,117	170,577	22	68	8,902	2,474	11,377	22	68
<b>Subtotal Livestock and Agricultural Development</b>	172,328	71,828	244,156	29	97	11,509	4,789	16,297	29	97
<b>Total BASELINE COSTS</b>	174,578	77,078	251,656	31	100	11,659	5,139	16,797	31	100
Physical Contingencies	5,219	1,864	7,082	26	3	348	124	472	26	3
Price Contingencies	11,956	3,392	15,347	22	6	306	91	397	23	2
<b>Total PROJECT COSTS</b>	191,752	82,334	274,086	30	109	12,313	5,353	17,666	30	105

29. **Financing.** The programme will be financed by an IFAD grant of USD 8.0 million or 45.3% of total cost; and a contribution in grant of USD 5.82 million, (the equivalent of EUR 4.7 million) or 40.36% of total cost from EC. The Government will provide a counterpart funding of the equivalent of USD 2.5 million or 14.1% of total cost in local currency- mainly in form of foregone duties and taxes while the beneficiary will finance the balance of the equivalent of USD 1.355 million in local currency, and in cash and kind. Table 4 below provides the financing proposal by component. EC financing will be directed at procurement of seeds, supply of equipment, machinery and materials for seed production, agricultural inputs including fertilizers, livestock drugs and vaccines and agro-chemicals. The details of financing plans are shown in Annex III and include expenditure accounts by financiers Annex III, Table 2.

**Table 4: Financing by Components (USD ‘000)**

Eritrea  
PCRRDP Expansion Programme  
Components by Financiers  
(USD ‘000)

	GoE		IFAD		EU		Beneficiary Contribution		Total		For. Exch.	Local (Excl. Taxes)	Duties & Taxes
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%			
<b>A. Capacity building &amp; Institutions Strengthening</b>													
Programme Implementation, Monitoring & evaluation	89	17.4	66	12.9	358	69.7	-	-	514	2.9	360	109	45
<b>B. Livestock and Agricultural Development</b>													
Animal Feed & Water Supply	253	12.5	1 268	62.5	267	13.2	240	11.8	2 028	11.5	899	898	230
Livestock Development	328	10.4	2 118	67.0	714	22.6	-	-	3 161	17.9	1 523	1 309	328
Agricultural Production	1 820	15.2	4 547	38.0	4 481	37.5	1 115	9.3	11 963	67.7	2 571	7 940	1 452
<b>Subtotal Livestock and Agricultural Development</b>	<b>2 402</b>	<b>14.0</b>	<b>7 933</b>	<b>46.3</b>	<b>5 462</b>	<b>31.8</b>	<b>1 355</b>	<b>7.9</b>	<b>17 152</b>	<b>97.1</b>	<b>4 994</b>	<b>10 148</b>	<b>2 010</b>
<b>Total PROJECT COSTS</b>	<b>2 491</b>	<b>14.1</b>	<b>8 000</b>	<b>45.3</b>	<b>5 820</b>	<b>32.9</b>	<b>1 355</b>	<b>7.7</b>	<b>17 666</b>	<b>100.0</b>	<b>5 353</b>	<b>10 257</b>	<b>2 055</b>

## **B. Procurement, Disbursement, Accounts and Audit**

### **Procurement**

30. As much as possible, the procurement will be centralized and handled by MOA-PSMU with requisite experience and which has been further strengthened under PCRRDP. Small procurements will be carried out at zoba level using the procurement units of PCOs.

31. Procurement of items financed by the EC and IFAD grants shall be subject to the provisions of the IFAD “Procurement Guidelines” approved by the IFAD Executive Board in December 2004, as such guidelines may be amended from time to time by the Fund. To the extent possible, vehicles, machinery, equipment, materials, goods, works and consulting services shall be bulked into sizable bid packages to attract competitive bidding. Along with AWPB, an 18 month procurement plan will be submitted to IFAD for approval. The procurement plan will satisfy the conditions stipulated in Appendix 1, paragraph 1 of the IFAD “Procurement Guidelines”. Contracts exceeding a value of USD 100,000 (or equivalent) shall be subject to ICB. Contracts between USD 50,000 and USD 100,000 will be subject to NCB, and will also be open for international bidding. Contracts for less than USD 50,000 will follow local shopping procedures requiring three quotations. Contracts costing USD 150,000 or more will require prior review by IFAD. Contracts for consultant services and studies will be in accordance with IFAD procurement guidelines. Terms of reference, conditions and terms of contracts, and qualification and experience of consultants will be subject to a prior review and expression of no objection by IFAD. Investments on civil works in relation to National Veterinary Laboratory, seed development including two seed stores and a green house are substantial to attract international bidders, therefore they will be procured following ICB procedures. Other civil works are small, scattered and in remote areas. They will not attract international bidders, therefore, they will be procured following NCB or local shopping procedures. In cases where local contractors have not shown interest, and where the capacity exists within the public sector, a force account procedure will be followed after approval by IFAD. Where works are within the technical capacity of the community, community procurement procedures will apply. The envisaged procurement packages are shown in Table 5 below and the first 18 months procurement plan is shown in Annex IV.

**Table 5: Procurement packages by Financiers**

	Procurement Method					Community Participation in Procurement	Total	GoE	IFAD	EU	Ben
	International Competitive Bidding	Local Competitive Bidding	Consulting Services	Local Shopping	Direct Contracting						
A. Vehicles	239	-	-	-	-	-	239	48	-	191	
B. Civil Works		-	-	-	6,598	-	6,598	961	4,865		772
<b>C. Equipment, Materials and Machinery</b>											
Seeds	1,086	-	-	-	-	-	1,086	109		978	
Fertilisers	1,509	-	-	-	-	-	1,509	151	245	1,112	
Chemicals	1,405	-	-	-	-	-	1,405	141	113	1,151	
Animals/ Birds	-	-	-	-	-	603	603	60		543	
Other Equipments	-	2,347	-	-	-	-	2,347	279	1,466	602	
D. Training, Workshops and Studies	-	-	-	510	-	-	510		510		
E. Technical Assistance	-	-	534	-	-	-	534	22	258	254	
F. Casual and Other Labour Costs	-	-	-	-	-	664	664	299			365
G. Equipment Hire Costs	-	2,064	-	-	-	-	2,064	413	538	896	
H. Allowances	-	-	-	-	57	-	57			57	
I. Operations and Maintance	-	-	-	51	-	-	51	9	5	37	
<b>Total</b>	<b>4,239</b>	<b>4,411</b>	<b>534</b>	<b>561</b>	<b>6,655</b>	<b>1,267</b>	<b>14,416</b>	<b>2,492</b>	<b>8,000</b>	<b>5,821</b>	<b>1,137</b>

## Disbursement

32. Disbursement for contract packages on vehicles, machinery, equipment, civil works, material, supplies and consultancy services, each costing in excess of USD 50,000 or equivalent will be fully documented. Disbursements for contracts or expenditures on training, workshops, local salaries and allowances, materials, office supplies and other operating expenses costing less than or equal to USD 50,000 will be made against certified statements of expenditure. Relevant supporting documents including suppliers' invoices, evidence of payment, analysis of bids and related contracts, and payment vouchers, will not be submitted but retained in a central location and made readily available for inspection and review by supervision missions and the auditors. No taxes and duties will be financed out of the proceeds of the grants.

## Accounts and Financial Management

33. The government's accounting policies and procedures which have been reviewed and found consistent with IFAD guidelines have been employed by IFAD assisted projects. The Add-on Programme will employ the same policies and procedures. The programme accounting arrangements shall comply with the requirements stipulated in the Government Financial regulations and the IFAD Financing Agreement.

34. The Finance and Administration Division (FAD) of MOA will oversee the programme accounts, procurement and disbursements. It will also ensure that financial management and control arrangements are adequate. A Finance Unit has been established in the Division, and also in PCOs at the zoba levels to be responsible for programme operations. The MOA and Zoba Administrations have internal audit units which ensure good internal control systems including pre and post audits of expenditure by operating departments. This internal control system will be used. Programme account units have suitable accountants to undertake all accounting services including bi-annual financial reporting. The FAD will prepare and submit to IFAD within 60 days of the end of the reporting period, financial monitoring report. The contents of these financial reports will include inter alia: sources and uses of funds by component, activities, and category of expenditure,<sup>1</sup> a comparison of actual and budget expenditure, both cumulatively and for the period covered by the report, and variance analysis. In order to ensure a timely submission of the report by FAD, the PCOs of the zobas will submit their reports to FAD not later than 30 days after the end of the reporting period.

35. In order to facilitate timely payments for services and supplies, and due to government inability to pre-finance eligible expenditures, IFAD and EC will provide necessary advance. For this purpose, the MOA will open a Special Account for EC in Bank of Eritrea. IFAD will augment its advance in the Special Account for PCRRDP. Upon satisfaction of first disbursement conditions and necessary requests from appropriate authority, IFAD will draw from IFAD grant account and make an additional deposit equivalent to **USD 0.67 million**, equivalent to an average of six month of expenditure eligible for IFAD financing to the existing PCRRDP Special Account. A similar arrangement will operate for EC and the amount of initial deposit into the EC Special Account is estimated at **USD 0.49 (equivalent to EUR 0.40)**. MOA, and each zoba will open and operate programme accounts in a commercial bank satisfactory to IFAD. The accounts will receive funds eligible for EC financing from the EC Special Account in local currency, in accordance with approved AWPB. Each implementing agency will maintain separate and independent accounts for EC and IFAD financed activities respectively. The chart of accounts and accounting practices already established under IFAD financed PCRRDP will be used for the Add-on Programme. The Financial Controller of the respective PCO will consolidate project accounts at the zoba level and will submit unaudited annual financial statements of zoba level expenditures for each fiscal year to FAD not later than 30 days after the close of the fiscal year. The FAD will also prepare similar financial statements for national level expenditures. A programme unaudited annual financial statements will be prepared by FAD and submitted to IFAD not later than 90 days after the close of the fiscal year.

---

<sup>1</sup> The flow of funds for the Programme is shown in Chart 3.

## **Audit**

36. Major disbursements will be subject to internal audit by the internal auditors of MOA and Zoba administrations. The internal auditors will apply internationally accepted internal audit procedures and control including pre and post-payment audits. Programme accounts, financial statements, and records will be audited each fiscal year by qualified independent external auditors acceptable to IFAD, under terms of reference cleared by IFAD, and in line with IFAD Guidelines for audits. The costs associated with the independent auditors services will be financed from the proceeds of the grants. The external auditors will examine the documentation related to expenditures carried out under SOE and provide opinion on the operation of the Special Accounts. The Government will submit audited financial statements along with a long form report not later than six months after the end of GOE's fiscal year which is 31 December.

## **V. IMPLEMENTATION AND INSTITUTIONAL ARRANGEMENT**

### **A. Organization and Coordination Arrangements**

37. Following the government policy change in 2007, transforming from Integrated Rural Development Programme to sector development approach, the overall implementation of PCRRDP was transferred from the Ministry of National Development to the Ministry of Agriculture. Thus the MOA assumed the overall responsibility for the implementation of PCRRDP in 2008.

38. As the proposed Add-on Programme will complement PCRRDP, the implementation will follow the institutional arrangements for PCRRDP. The policy, strategy and organizational framework including coordination of implementation will be harmonized to enhance implementation efficiency, reduce overhead costs and ensure sustainability. The implementation of Add-on Programme as for PCRRDP will be fully integrated into the governments decentralized system of administration. The planning, implementation and monitoring/evaluation will be community and beneficiary driven. The line departments of MOA will provide technical backstopping to their counterpart zoba line Divisions that are responsible for the day to day implementation in line with their respective mandates.

39. The overall management of the PCRRDP and the add-on activities will be entrusted to the Ministry of Agriculture under the direct supervision of the Minister of Agriculture. The implementation at the regional level will be entrusted to the Zoba (regional) Administration with the Executive Governor assuming responsibility. A Programme Coordination Office (PCO) which has been established in each of the two participating zobas (Gash Barka and Debub), for programme planning, coordination and monitoring/evaluation of PCRRDP will also perform the same functions for the PCRRDP Add-on Programme. The PCO is headed by a full-time coordinator appointed by the GOE and acceptable to IFAD. Each PCO comprises three administrative units: (i) the Office of the Programme Coordinator, containing the Programme Coordinator, a procurement officer and a Personal Assistant; (ii) the Finance and Administration Unit with a Financial Controller, an Accountant, an Administrator, and a Secretary; and (iii) the Planning, Monitoring and Evaluation unit with a M&E Officer, an Economist and a Data Management Officer. The PCRRDP has provided support for the development of internal audit units for the two *zoba* administrations, as well as providing training on programming, budgeting, accounting, procurement, monitoring and evaluation to senior *zoba* administration staff.

40. A National Coordination Office headed by a full-time coordinator acceptable to IFAD has been established within the Planning and Statistic Division of the MOA for overall coordination of planning, implementation and monitoring/evaluation. A Financial Management Unit which is responsible for coordination of procurement, accounts and disbursement has been established within the Finance and Administration Division of MOA. All the coordination offices have been properly staffed and functioning, and will ensure timely and effective coordination of implementation of Add-on Programme in full integration with PCRRDP operations.



41. The oversight responsibility for ensuring that programme activities are implemented within the national policy and strategy has been entrusted to a National Steering Committee (NSC), and Zoba Programme Coordination Committees (PCC) at the respective zoba level. Technical oversight is through the National Technical Support Committee, and the Zoba Technical Support Committee (ZTSC) in each of the participating zobas. The National Steering Committee is chaired by the Minister of Agriculture and comprises of the Minister of MLWE, Governors of participating zobas, the Director-Generals of APDD, and RSD of MOA, the Director-General of the Department of Environment of MLWE. The Director of PSD of MOA is the Secretary. The ZPCC is chaired by the Governor and comprises the Directors of Zoba Departments, head of Zoba Agricultural Division, representative of National Union of Eritrean Women (NUEW). The Zoba Programme Coordinator is the Secretary. These committees have been properly constituted and functioning. The organizational framework is shown in Figure 1.

## **B. The Implementation Arrangements**

42. The PCRRDP – Add-on Programme will be implemented over a six year period. Implementation will be at national, zoba and kebab levels. The principal implementing agencies are the MOA, the Zoba Administration, and community-based organizations. The APDD will provide technical oversight and backstopping to the Agricultural Division of the Zobas which will be responsible for the implementation of agricultural and livestock development. The RSD will be responsible for quality control and certification of agricultural products and particularly for milk and milk products, ensuring that chemicals to be used satisfy the international standards, and provide quarantine services in reference to imported/exported products. It will also certify seed quality. The Environmental Division of MLWE will handle environmental issues.

43. Implementation will require mobilization and sensitization of the stakeholders as to the implementation modality and their respective roles. Thus, the first action in implementation will be the holding of an inception workshop. Implementation will be based on a detailed Annual Work Plan and Budget (AWPB) which will be consistent with the contents of PCRRDP and the Add-on activities. However, opportunity to respond to changing environment in the country will be permitted. Once the PCRRDP Add-on becomes operational, a single AWPB will be prepared for the PCRRDP and its add-on activities. However, budget and activities will be clearly defined for each within the AWPB. The AWPB will be approved by IFAD and co-financiers. The detailed implementation procedures already elaborated in a Programme Implementation Manual (PIM) will also apply.

### **Community and Beneficiaries Participation**

44. Implementation will be driven by the communities and producer organizations with backstopping from the Zoba Administration, and appropriate NGOs. The Agricultural Division of the Zoba Administration has been strengthened by the creation (under the PCRRDP) of a Project Facilitation Unit (PFU) specifically charged with the responsibility for sensitization, mobilization and organization of interest groups, and arranging necessary community level capacity building and training. The efforts of the PFU will be complemented by community development agents, technical staff and para-staff, e.g. Community Animal Health Workers at the *kebab* level. The kebab administrator will be the lead agent at kebab level, and will coordinate efforts for development under the Programme. The Programme will work with two kebab level committees namely, the **Development Planning and Implementation, and Agriculture Committees**. In addition, Economic interest groups, e.g. Herders Association, and Water Users Association will be developed and supported. The participatory planning processes already established under PCRRDP will be followed and coordinated planning at the Kebab level will be assured. The established participatory planning and implementation processes involve mobilization and organization of communities, exposing them to development opportunities under the Programme, decision by the community or groups on activities of interest to them, technical support from the Zoba Administration to communities and beneficiaries to plan and budget for the selected activities, agreement between communities/beneficiaries with zoba administration on mode of contribution, and training on implementation and

monitoring/evaluation. The plans and budgets will be aggregated at *Kebabi* level and submitted to sub-zoba for review and agreement, consolidation and submission to zoba for final approval and incorporation in the programme AWPB. Activity detailing and sequencing are part of the AWPB process and are jointly defined by the Programme and the beneficiaries. IFAD will check during the review of the AWPB that appropriate sequencing of events are reflected, that necessary priorities have been accorded to women, and that development activities will involve active participation of beneficiaries.

45. The communities/beneficiaries will contribute to development efforts and will assume major responsibilities in the operation and maintenance of assets created by the programme such as irrigation facilities, Hafirs, catchment protection and rangeland improvement. The communities/beneficiaries will also be involved in monitoring project implementation and evaluating its impact.

46. **Gender sensitivity.** Experience from past IFAD operations in Eritrea has shown that the cultures and traditions of a number of the ethnic groups within the programme area favour having separate organizations and training for women. These traditions will be respected when developing the Programme's community level capacity building activities. Where there are no cultural/traditional limitation on joint operations by both men and women the Programme will ensure that women are adequately represented, and have equal opportunities to hold decision making posts. The timing and where the training is conducted can also negatively affect women's participation, hence such constraints will also be taken into account. Poor representation of women in programme development committees can negatively affect the access that women have to programme supported investments; for this reason the Programme will promote adequate representation of women in the various committees and decision-making bodies involved in programme implementation through community sensitization and training. The NUEW has proved useful in mobilizing rural women and fostering their interest under the IFAD GBLADP, hence its good offices will be drawn on by the Programme. The organization's presence at *kebab*i level and its political activism are positive attributes that the Programme can utilise. The Programme will seek to engage the services of other NGOs, as may be needed, particularly those already working in the programme area. The government has initiated a program to strengthen extension services by providing frontline extension staff, and has assured that women will be given equal opportunities to serve as frontline extension officers. Other appointments under the Programme will also give equal opportunities to women. In spate and small-scale irrigation, WHHs will have equal access to land. Women will have equal opportunity to undertake small-scale dairy, while small-stock activities and backyard poultry are exclusively designed for operation by women.

### **Programme Supervision**

47. The PCRRDP – Add-on Programme will be directly supervised by IFAD along with the PCRRDP. EC will participate in field missions as may be desired by it. A six monthly supervision is planned and supervision mission team will include requisite consultants to permit physical and financial evaluation of performance. Supervision mission report will show achievements and expenditure of PCRRDP, and PCRRDP-Add-on separately, and consolidated. EC will provide within its programme finance, contribution to meet part of the cost of programme implementation assistance, supervision and loan administration.

## **C. Monitoring and Reporting**

48. The logical framework annex I, table 1 and IFAD's Results and Impact Management Systems (RIMS) will provide the basis for monitoring and evaluation. The main monitoring and evaluation indicators are reflected in Annex I, Table 2: Results Framework. It has to be noted however, that the indicative indicators which are reflected in the Annex I – Table 2 will need to be re-examined and improved upon during implementation. The institutional arrangements already established by the GOE under PCRRDP will be employed under the proposed Add-on Programme.

## **Responsibility**

49. The National Project Coordination Office (NPCO) will assume overall responsibility for progress, monitoring and evaluation reports under the supervision of the Director of Planning and Statistics Division (PSD) of MOA. At the zoba level, progress, and Monitoring and Evaluation reports will be carried out by the monitoring and evaluation unit of PCO. For national based operations, NPCO monitoring office will produce progress and M/E reports for programme related activities. Each of the reporting offices will produce progress report on a quarterly basis for government, and six-monthly and annual progress reports for IFAD and EC. Annual M&E report will also be produced and submitted to IFAD. The progress reports and M&E reports will be submitted to NPCO which will produce the consolidated programme progress and M&E reports. These reports will be submitted to IFAD not later than 60 days after the end of the reporting period. In order to meet this schedule, the reporting offices will submit their reports to NPCO not later than 30 days after the end of the reporting period. The NPCO will also have the responsibility for carrying-out: a mid-term review, an impact study, special reports and the Project Completion Report (PCR) as already scheduled under PCRRDP. These reports will be submitted to IFAD not later than 30 days after the completion dates of the studies as will be agreed with IFAD in the respective terms of reference.

## **Baseline Study**

50. A baseline study has been carried out under the IFAD-financed PCRRDP, and focus on baselines for socio-economic situation, and agricultural and livestock production situation. The same baseline study will be used by the PCRRDP-Add-on.

## **M&E Workshop**

51. A monitoring and evaluation workshop will be held to discuss the findings of baseline study, present the M&E system applicable to PCRRDP and this Add-on, expose the progress and M&E report formats, review and update the logical framework to agree on M&E indicators and set out the process for mainstreaming the M/E operation of the Programme. The outputs of the workshop will provide the basis for finalizing the design of M/E system under the Programme, and consistent with operating system under PCRRDP.

## **Beneficiary Participation**

52. The participating communities will carryout M/E of activities in which they are involved. The Programme will train and provide them technical support for this purpose. As part of the Kebabi Development Plan (KDP), a set of indicators will be developed; method of collecting the data to measure the indicators will be defined and exposed to the community M/E committee. Format for reporting will be developed and materials including reporting forms will be provided. Motivation will be provided by relating monitoring and evaluation outputs to conditions which the communities are aware of and which impinge on their livelihood. For example, uncontrolled grazing will lead to further degradation of the community grazing land which will impact negatively on livestock productivity therefore, the community will have to closely monitor the use and management of rangeland. Exposure of catchments and watershed areas has caused siltation of small dams and hafirs, which affect crop and livestock production therefore, the community will have to monitor the impact of development in these areas to introduce corrective measures including erosion control to avoid siltation of hafirs and dams, and reduce the loss of top soils. The Programme will introduce as part of the monitoring system, an education on making use of monitoring and evaluation information for timely community action on mitigating production problems. The communities will appoint M&E committees which will be trained by the Programme. The Programme monitoring officer at the zoba level, will be charged with the responsibility of providing necessary assistance including training, and supervision of operation. An extension officer will be trained to backstop the community in each *Sub-Zoba*. The kebabi will produce an annual M/E report on food crisis and soaring prices issues. At the end of each year of implementation, a participatory review of the monitoring and evaluation report

along with the year's operations by the community would take place to discuss the implementation of the agreed plans, and identify benefits, problems and issues which need to be addressed. Lessons learnt will also be exposed. The conclusions, and recommendations will be summarized and submitted to Kebabi council for deliberation and decisions on follow-up actions. The participating Kebabi monitoring and evaluation reports including Kebabi councils' actions on issues and problems of food security will be submitted to the programme annual implementation review workshop for discussion and will provide inputs in defining agricultural/livestock best practices.

### **Impact Studies**

53. In addition to evaluation of project results undertaken annually through progress and M&E reports, more formal assessments of impact will be undertaken during the implementation period in the second quarter of PY3. Studies will be based on purposeful sampling and will focus on measuring impact at the objective rather than goal level. The result of such studies however, will provide credibility for assertions that may be made on programme contribution to impact at the higher (goal) level. The subject for study will be jointly determined by EC, IFAD and GOE and may include: (i) assessment of the capability of kebabi to prepare agricultural/livestock plans, and implementation of such plans; (ii) users organizations effectiveness and sustainability; (iii) assessment of programme impact on food supply and prices.

54. An **Annual Implementation Review workshop** will be held with the participation inter alia, of beneficiaries, the implementing agencies, the national CPMT members, representatives of ongoing similar projects financed by other development partners, NPCO staff, and National steering committee members. The workshop will review implementation and draw lessons from experience. The conclusions of the workshops including recommendations will be submitted to the National Steering Committee and will constitute items for deliberation and decision on best practices that will be adopted by the Programme in the following year.

### **Knowledge Management**

55. The database and knowledge management centre that has been established by the PCRRDP will develop a communication and information system to share experiences and knowledge. It will produce news letter in local languages and English, ensure wide circulation of annual progress monitoring and evaluation reports; conclusions and recommendations of Annual Implementation review workshops, and other information from ICT established under the programme.

### **Mid-term Review (MTR)**

56. A MTR will be carried out by the first quarter of project year 4. This will determine progress being made towards the achievement of the objectives and goal of the programme and will also evaluate the effectiveness, efficiency, and timeliness of project implementation. It will highlight issues requiring decisions and action to improve implementation, present initial lessons learned and identify course correction if needed. GOE, EC and IFAD will decide if necessary, on any design modifications necessary for improvements in project performance.

57. A **programme completion study** will take place prior to programme completion. It will evaluate: outreach, outcome, impact and sustainability of results. The programme completion report will be submitted to EC/IFAD by not later than one month before the close of the Programme.

## VI. PROGRAMME BENEFITS, RISKS AND SUSTAINABILITY

### A. Benefits

#### Benefits

58. The Add-on Programme will result in major benefits including significant increase in agricultural and livestock production and productivity, improvement of rural household income, and institution strengthening. By PY<sub>4</sub>, Incremental annual food production is estimated to reach 48,800 tonnes of grains, 10,900 tonnes of potatoes, 2,200 tonnes of banana, and 59,900 tonnes of fruits and vegetables, 1.5 million litres of milk, and 137 tonnes of beef. About 3.3 million units of chicken will be produced. Grass and forage production has been estimated at 739,300 tonnes. Increase in household income will depend on the enterprises selected. The financial returns of sample enterprises and farm models are presented in table 6 below and show significant improvement in household incomes. The expansion of production of fruits and vegetables, increased production of milk, and a wide promotion of backyard poultry will have positive impact on rural household nutrition. The increased production of food will enhance household and national food security, and impact positively on national food shortage and soaring food prices.

**Table 6: Returns on Enterprises/Farm Models (ERN)**

Item		Incremental household income (ERN)	Return to labour
<b>RAINFED</b>			
<b>Farm Model</b>			
Sorghum/pearl millet (1.5ha)		10,113	50.1
Sorghum/finger millet/maize (2 ha)		13,750	51.7
Barley/sorghum/maize (1.5ha)		11,543	55.4
<b>Crop Enterprises (one ha)</b>			
Sorghum		3,827	32.4
Pearl millet		9,513	58.2
Maize		20,652	108.9
Barley		13,510	76.4
<b>IRRIGATION</b>			
Model 1:	0.1 potato	71,260	643.3
	0.1 onion		
	0.05 pepper		
Model 2:	0.1 tomato	100,823	2,634.7
	0.1 onion		
	0.05 pepper		
<b>LIVESTOCK</b>			
Dairy unit (2 dairy cows)		10,617	142.5
Backyard poultry (20 hens, 7 cocks)		28,661	361.5

#### Beneficiaries

59. It is estimated that about 34,150 households of which about 16,450 will be WHH will directly benefit from the add-on activities in agriculture and livestock. They will have improved access to agriculture and livestock inputs which will increase the yields of crop and livestock.

### **Economic Rate of Return**

60. The economic rate of return has been estimated over a 20 year period at 20% and was found very robust with a sensitivity analysis showing a drop to 18% if benefits are delayed by 2 years, and to 14% if costs increase by 10% or benefits reduced by 10%.

### **B. Risks, Analysis and Mitigants**

61. The main potential risks for the Programme are related to the insecurity in the south of the country. A narrow stretch of the proposed programme area is within the Temporary Security Zone adjacent to the Ethiopian border. There will need to be a reduction of tension in order to allow implementation of the Programme in this area. There are capacity constraints at all levels of Government, and civil society which may impose constraints on programme implementation. These constraints will be ameliorated through the strengthening of MOA, the Zoba Administration and the communities. Eritrea is prone to drought and erratic rainfalls. This will affect agricultural and livestock production drastically when they occur. To respond to the risk, the Programme will expand irrigation, promote drought tolerant varieties, and support improved range management and expand watering points for livestock. Conflicts between farmers and agro-pastoralists, and pastoralists may arise from expansion of rainfed and irrigated crop areas which may reduce areas of communal range, and prevent grazing of crop stovers by pastoralists as traditional. Continuation of the tradition of open stovers grazing will interfere with the production system of farmers and agro-pastoralists particularly those planting ratooning sorghums in spate irrigation. This risk will be addressed through the application of traditional conflict resolution involving consultations and agreement on measures to mitigate conflicts. For example, ELWDP and GBLADP, livestock have been excluded from irrigated areas and farmers/pastoralists are permitted to harvest ratoon crops and collect stovers before livestock can enter. Pastoralists are also encouraged to participate in irrigation programmes and to cultivate rainfed crops. Efforts of the Programme to improve rangelands will increase grass and forage production which will partly substitute for loss of rangelands. NGOs such as NUEW and Citizens for Peace, and Zoba Administration will facilitate resolution of conflicts through promotion of dialogue in the affected communities.

### **C. Sustainability, Replicability, and Exit Strategy**

62. **Sustainability and Replicability:** IFAD experience in Eritrea has demonstrated that successful implementation and sustainability of development programmes are likely if the interventions respond to the beneficiaries priorities, communities are actively involved in planning and implementation, and programme utilize their traditional organizational/institutional structures. Eritrea being a drought prone country, agriculture and livestock development is highly dependent on improving the availability of water, improved range management, and generation and dissemination of affordable technologies which are resilient in drought and bad rainfall conditions. PCRRDP interventions include irrigation development, improved range management, provision of livestock watering points, soil and water conservation, and promotion of drought resilient technologies. These measures which respond to the needs of communities and beneficiaries, have received enthusiastic responses and a high level of support. The Add-on Programme will expand these measures, and build-on and deepen the participatory development approach already established by past IFAD programmes. The activities promoted by PCRRDP and Add-on respond to the needs of beneficiaries and are likely to be sustained and replicated. The ELWDP which closed in 2006 has been sustained by the beneficiaries and GOE, while the ongoing GBLADP has witnessed the replication by communities, of certain initiatives, e.g. VLEA promoted by the project.

63. The production of certified seeds and planting materials has hitherto been ad-hoc. The PCRRDP and its Add-on will institutionalize the production of seeds and planting materials. The system will respond to the needs of smallholders and fully involve them in production and management. Further, the financing arrangements for agricultural inputs will include the establishment of viable revolving funds to ensure sustainability. Policies that will ensure sustainability

and promote private sector initiatives will be supported. They include: market-based pricing for inputs and outputs, cost recovery system for small-scale irrigation, creation of revolving funds for sustained financing of inputs, encouraging commercial production of seeds/planting material by Private Sector Contract growers including smallholders.

64. The alignment of the programme design and its implementation arrangements with public strategies, policies, procedures and institutional framework will provide the needed foundation for sustainability after the programme completion. Further, the adoption of a participatory approach involving all stakeholders from the design stage has sensitized and created awareness on the self-sustaining approach of the Programme and will be further deepened during implementation to enhance ownership by communities and producer organizations, who will be expected to take major decisions, and contribute labour and materials towards the implementation of activities under the Programme. The Programme is fully integrated within the decentralized institutional framework of Eritrea and provides for implementation coordination at the national and zoba levels. It has been agreed with the GOE and generally acceptable to several development partners that future support to agriculture by development partners will use the established institutional framework, however, the capacity will be strengthened as may be desired to undertake added responsibilities.

65. **Exit Strategy.** The programme will be implemented within the existing institutional and policy framework of government. The relevant government institutions will be strengthened and necessary institutional linkages from the kebedi to national level will be assured. A seed/planting material production system will be established through collaboration between APDD and NARI, and full participation by the beneficiaries. The implementation of Add-on Programme will be fully coordinated with the implementation of PCRRDP including the development and implementation of an effective, result-based monitoring and evaluation system. The coordination arrangement including policy and strategy coordination is designed for application nationally and for adoption not only by IFAD but by the other development partners. The line department/division at regional and national levels will be encouraged to work in close collaboration and to provide coordinated support to communities, producer groups and organizations. The driving force for project planning, implementation, monitoring and evaluation will be the community, producers organizations and the traditional institutions and systems. The Programme will strengthen the capacity of these community-based institutions and systems to fully participate in the planning and implementation and assume full operation of economic infrastructure after the Programme. A revolving financing system managed jointly by GOE and beneficiaries will be established for input supply so that communities/beneficiaries, and government can assure sustained financing post-programme implementation.

## **VII. SUPPLEMENTARY ASSURANCES AND CONDITIONS TO BE INCLUDED IN IFAD FINANCING AGREEMENT**

66. No new financing agreement will be entered into. The existing financing agreement for PCRRDP will be amended to accommodate the provisions set-out below.

67. The EC funding will be channeled through IFAD for direct disbursement and administration. The IFAD Financing Agreement will be the only agreement that will be executed with the GOE for the Programme Implementation, Supervision and Grant Administration. IFAD and EC will execute **“EUROPEAN COMMUNITY CONTRIBUTION AGREEMENT WITH INTERNATIONAL ORGANIZATION”**. Any obligation of the government contained in this agreement will be incorporated in the IFAD Financing Agreement.

68. The following assurances will be sought at negotiations and included in the IFAD Financing Agreement.

- 1) The programme implementation institutional arrangements, policies, and strategies will be in accordance with the established arrangement under PCRRDP.

- 2) Each implementing institution will keep separate and independent accounts to record all transactions financed with IFAD and EC grants respectively. The chart of accounts, financial policies and account procedures will be standardized with PCRRDP which have been agreed by GOE and IFAD.
- 3) A mid-term review shall be carried out not later than the first quarter of PY4 and report submitted to IFAD not later than third quarter of PY4. Agreed recommendations shall be implemented as from the fourth quarter of PY4.
- 4) MOA, PCO at Debub, and PCO at Gash Barka shall open and operate respectively an operating account in a commercial bank acceptable to IFAD to receive EC contribution in local currency from the EC Special Account in accordance with agreed AWPB. The existing operating accounts under PCRRDP will receive IFAD contribution to finance programme operations in accordance with agreed AWPB.
- 5) Implementation support arrangements will be made to assist harmonization of PCRRDP and PCRRDP Add-on implementation. The cost will be financed from EC/IFAD grant.
- 6) GOE undertakes to put in place policies, strategies and institutional arrangement for seed/planting material production and distribution. The seed/planting material production system will include public-private sector collaboration and such other measures that will ensure efficiency and sustainability.
- 7) GOE will put in place a Revolving Fund Arrangement for (i) agricultural input supply; and (ii) animal drug and vaccine supply under the Programme. Existing similar accounts can be used, subject to agreement with IFAD, and maintenance of accounts and records reflect IFAD contribution.
- 8) A cost-recovery policy will be established for sustained operation and expansion of smallscale and spate irrigation schemes.
- 9) The management capacity for smallscale irrigation schemes will be improved by.
  - (i) Allocation of extension staff to support planning, provide technical assistance to producers, and assist in organizing primary processing, packaging and marketing of products. The self-managed arrangements including full payment of staff, by farmer organizations will be piloted and if found feasible implemented by PY4.
  - (ii) Effective organization of producers into self-supporting production and marketing groups, associations or cooperatives.
  - (iii) Introduction of cropping system that will assure at least 200% cropping intensity while avoiding soil degradation.

### **Conditions for Disbursement**

69. The conditions of disbursements are set-out below:

- (a) For EC funding, the Government has confirmed the acceptance and use of EC funds on terms and conditions contained in these Financing Agreement; EC has deposited the financing requirement for PY<sub>1</sub> into EC Grant Account established by IFAD; and necessary Agreement to administer EC grant has been signed by EC and IFAD.
- (b) For EC funds, opening of Special Account in Bank of Eritrea or another bank satisfactory to IFAD.
- (c) For both grants – the first year AWPB has been submitted and found satisfactory by IFAD.
- (d) For both grants, confirmation by GOE of approval of budget for the first year counterpart fund contribution.



## ANNEX I-1: LOGICAL FRAMEWORK

Narrative Summary	Performance Indicators	Means of Verification	Assumptions and Risks
<b>Goal</b> To ameliorate the impact of global food crisis and souring food prices and contribute to food security and poverty alleviation	<ul style="list-style-type: none"> <li>At least 60% of rural households in the project area attaining food security</li> <li>Reduction of national food insecurity to not more than 40%</li> <li>Policies and strategies for sustainable agriculture/ livestock development are improved</li> <li>Stability in food prices</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Agriculture annual report</li> <li>Ministry of National Development Economic reports</li> <li>Monitoring and evaluation report</li> <li>Mid-Term Review report</li> <li>Special studies</li> <li>Programme completion report</li> </ul>	<ul style="list-style-type: none"> <li>No resumption of hostility between Eritrea and Ethiopia</li> <li>Good neighbourliness with other border countries particularly Sudan and Djibouti</li> <li>No major and prolonged drought</li> <li>Free-trade policy prevails</li> <li>Private sector initiatives enhanced</li> <li>Enabling macro-micro policy in place</li> </ul>
<b>Objective</b> To accelerate agricultural and livestock production/productivity through short – medium term measures to address national food shortage and ameliorate soaring food prices	<ul style="list-style-type: none"> <li>Increase in agricultural production in the programme area by at least 50%; and livestock by at least 10%</li> <li>An improved/certified seed system capable of meeting at least 50% of smallholders need in the Programme area is functional</li> <li>A sustainable input financing system is established and fully functional by PY<sub>4</sub></li> <li>At least 5% of crop farmers become agro-pastoralists</li> </ul>	<ul style="list-style-type: none"> <li>Programme progress reports</li> <li>Programme monitoring and evaluation report</li> <li>Programme MTR</li> <li>Special studies</li> <li>Supervision reports</li> <li>MOA annual report</li> <li>Programme completion report</li> </ul>	<ul style="list-style-type: none"> <li>Political stability endures</li> <li>Capacity of National Agricultural Research Institute enhanced</li> <li>Policy/strategy review to install a sustainable technology generation and dissemination is put in place</li> <li>Macro-micro-policy framework is conducive for free market and private sector investment</li> <li>Inter agency collaboration and appropriate institutional linkage improves</li> </ul>
<b>Programme Outputs</b> Output 1: Agriculture and Livestock Development <b>1.1 Agriculture Development</b>			
<b>1.1.1 Crops</b>	<ul style="list-style-type: none"> <li>The tissue culture laboratory fully equipped</li> <li>A green house for seed development built</li> <li>2 potato seed stores rehabilitated</li> <li>NARI provided machinery and equipment for breeder and foundation seed production</li> <li>Households with access to improved/certified seeds in the programme area increased from about 10% to over 50%</li> <li>NARI is able to produce needed breeder and foundation seeds to meet the national requirement</li> <li>Smallholders trained in the production of certified seeds</li> <li>A viable seed production processing and distribution system established not later than PY<sub>3</sub></li> <li>Institutional framework involving smallholders established to operate inputs (crops/livestock) revolving funds</li> <li>Yields in rainfed areas improved by 15 – 20%</li> <li>Rainfed agricultural area receiving complete package of seed, fertilizer and land cultivation by tractor or draft animal increase by at least 30%; and rainfed areas receiving improved</li> </ul>	<ul style="list-style-type: none"> <li>MOA annual report</li> <li>MND economic reports</li> <li>Progress reports</li> <li>Monitoring and evaluation report</li> <li>Supervision reports</li> <li>Special Studies</li> <li>NARI annual report</li> <li>Annual implementation review reports</li> <li>MTR report</li> <li>Programme completion report</li> </ul>	<ul style="list-style-type: none"> <li>Internal political stability is maintained</li> <li>No resumption of hostility between Ethiopia and Eritrea</li> <li>Macro-micro policy enhance performance of smallholder and the private sector in agriculture</li> <li>No severe and prolonged drought</li> </ul>

Narrative Summary	Performance Indicators	Means of Verification	Assumptions and Risks
	<ul style="list-style-type: none"> <li>only increased by at least 50% in the programme area</li> <li>Area under spate irrigation increased by at least 2000ha</li> <li>110% cropping intensity in spate irrigation area achieved</li> <li>Area under smallscale irrigation increased by at least 400ha</li> <li>At least 200% crop intensity achieved in smallscale irrigation</li> <li>An improved and sustainable irrigation management system is established and functional</li> <li>In rainfed and irrigated areas appropriate crop rotation system is established and operational</li> <li>Technology generation and dissemination enhanced</li> <li>At least 24 water user associations established and functional</li> <li>Outgrowers organized and trained to produce certified seeds</li> <li>Woman headed households, willing pastoralists and resettled families have equal access to irrigated land</li> <li>At least incremental production of 30,000 tonnes of grains/pulses produced annually starting from PY4</li> <li>At least incremental production of 100,000 tonnes of fruits and vegetables produced</li> </ul>		
<b>1.1.2 Livestock Development</b>	<ul style="list-style-type: none"> <li>At least 450 viable units of smallscale dairy are established</li> <li>Two milk collection/marketing centres established</li> <li>Over 6000 household have access to extensive backyard poultry, and each maintain 25-30 birds for income and nutrition</li> <li>At least 2 local breed breeding centres are established to provide healthy pullets to women</li> <li>Community Animal Health workers system improved and brought under beneficiary management</li> <li>14 clinics facilities are improved to store and distribute veterinary drugs and vaccines</li> <li>Over 50,000 ha of rangelands are improved</li> <li>At least 10 livestock watering points developed</li> <li>At least 2 dairy cooperative societies are established and functional</li> <li>30 communities mobilized and organized for management of closure</li> <li>At least 35 herders associations established for the management of VLEA</li> <li>228 tonnes of beef produced by PY4</li> <li>1.15 million litres of milk produced by PY4</li> <li>Bio-mass production yield increased from 5,000kg/ha to</li> </ul>	<ul style="list-style-type: none"> <li>MOA annual report</li> <li>MND economic report</li> <li>Progress reports</li> <li>M&amp;E reports</li> <li>Supervision reports</li> <li>Special studies</li> <li>MTR</li> <li>Project completion report</li> <li>Zoba report on abattoir operations</li> <li>Animal health survey report</li> <li>Annual vaccination campaign report</li> </ul>	<ul style="list-style-type: none"> <li>Internal political stability maintained</li> <li>No resumption of hostility between Ethiopia and Eritrea</li> <li>Macro-micro policy conducive</li> <li>Boarder trade in livestock and livestock products enhanced</li> <li>No severe and prolonged drought</li> <li>No major outbreak of livestock disease</li> </ul>

Narrative Summary	Performance Indicators	Means of Verification		Assumptions and Risks
	25,000kg/ha			
<b>2. Institution Development and Capacity Building</b>	<ul style="list-style-type: none"> <li>Information and Communication Technology centre established to provide production and marketing information widely</li> <li>50 staff trained at national and zoba levels in hardware and software management</li> <li>The generality of technical, accounting, and administrative staff trained to improve their computer application knowledge</li> <li>MOA and NARI strengthened to operate a sound and sustainable seed productin and distribution system</li> <li>AWPB regularly submitted and found satisfactory</li> <li>Progress reports; M/E reports, audits reports produced and submitted on schedule</li> <li>Project completion report produced and submitted.</li> <li>A seed system development committee established</li> </ul>	<ul style="list-style-type: none"> <li>MOA annual report</li> <li>Annual report (MOA)</li> <li>Progress report</li> <li>M&amp;E report</li> <li>Supervision report</li> <li>Special reports</li> <li>MTR report</li> <li>Programme completion report</li> <li>Annual implementation review workshop report</li> <li>Quarterly agricultural market/price report</li> </ul>		<ul style="list-style-type: none"> <li>No policy restriction on the deployment and use of ICT</li> <li>Internal political stability</li> <li>No resumption of border hostility between Eritrea and Ethiopia</li> </ul>
Project Component/Inputs	Costs (USD million)	Financing (USD million)		Means of verification
<ul style="list-style-type: none"> <li>Agriculture and Livestock Development <ul style="list-style-type: none"> <li>- Agriculture</li> <li>- Livestock</li> </ul> </li> <li>Subtotal</li> <li>Capacity Building</li> <li>Total</li> </ul>	11.96 <u>5.19</u> 17.15 <u>0.51</u> 17.66	<ul style="list-style-type: none"> <li>IFAD Grant</li> <li>EC grant</li> <li>Total external financing</li> <li>GOE contribution</li> <li>Beneficiary contribution</li> <li>Total local financing</li> <li>Total financing</li> </ul>	8.00 <u>5.82</u> 13.82  2.49  <u>1.35</u> <u>3.85</u> 17.66	<ul style="list-style-type: none"> <li>Grant Agreement</li> <li>Disbursement records</li> </ul>

## ANNEX I-2: RESULTS FRAMEWORK

Goals/Objectives/ Outputs	Indicators	Targets						Information Sources	Responsibilities
		PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>		
<b>Goal</b> To ameliorate the impact of global food crisis and souring food prices and contribute to food security and poverty alleviation	• Rural households in the project area attain food security: % food security	5.0	15.0	30.0	40.0	50.0	60.0	• MOA Annual report • M/E report, MTR • PCR • Special studies	• Hon. Minister of Agric • Zoba Governors • Beneficiaries
	• Food prices decline and become stable by PY <sub>4</sub> (%)	5.0	10.0	15.0	20.0	PS <sup>2</sup>	PS		
	• Policies and strategies for sustainable agricultural/livestock including public-private collaboration are improved	-	√	√	√	√	√		
<b>Objective</b> To accelerate agricultural and livestock production/productivity through short medium term measures to address national food shortage and ameliorate soaring food prices	• % increase in livestock production in the project area	-	5.0	10.0	15.0	20.0	25.0	• MOA Annual report • M/E report, MTR • PCR • Special studies	• APADD • Environment Dept MOLWE • Zoba Agric Division • Beneficiaries
	• % increase in grain production by at least	5.0	15.0	20.0	30.0	40.0	50.0		
	• An improved/certified seed system capable of meeting at least 50% of programme area requirement is functional	-	-	√	√	√	√		
	• A sustainable input financing system is established and fully functional	-	√	√	√	√	√		
	• Sustainable land management system is established and functional	-	-	√	√	√	√		
<b>Programme Outputs: Output 1: Agriculture and Livestock Development</b>								• Progress reports • M/E reports • MTR • Special studies • PCR	• The Governors of participating zobas • APDD • NARI • Agriculture Divisin of participating zobas • Beneficiaries • Irrigation Dev Unit of APDD • MOLWE • Infrastructure services unit of Zoba Administration
<b>1.1 Agriculture Development</b>									
<b>1.1.1 Crop</b>	• Households with access to improved/certified seeds in the programme area increased from about 10% to over 50%	10.0	15.0	25.0	35.0	40.0	50.0		
	• NARI is able to produce needed breeder and foundation seeds to meet the national requirement - % achievement	5.0	10.0	-	-	-	-		
	• Smallholders trained in the production of certified seeds	√	√	√	√	√	√		
	• A viable seed processing and distribution system established by PY <sub>3</sub>	-	√	√	√	√	√		
	• Institutional framework involving smallholders established to operate inputs (crops/livestock) revolving funds – PY <sub>3</sub> /PY <sub>4</sub>	-	√	√	-	-	-		
	• % Yields in rainfed areas improvement	5.0	15.0	25.0	35.0	45.0	50.0		
	• Area under spate irrigation increased	250.0	1000	1500	2000	2000	2000		

<sup>2</sup> Price Stability.

		Targets							
	• % cropping intensity achieved	-	100.0	115.0	120.0	125.0	130.0		
	• Area under improved smallscale irrigation increased (ha)	100.0	200.0	500.0	500.0	500.0	500.0		
	• % crop intensity in smallscale irrigation	100.0	130.0	140.0	200.0	200.0	200.0		
	• An improved and sustainable irrigation management system is established and functional	-	-	√	√	√	√		
	• In rainfed and irrigated areas appropriate crop rotation system is established and operational			√	√	√	√		
	• Technology generation and dissemination enhanced	-	√	√	√	√	√		
	• Woman headed households, willing pastoralists and resettled families have access to agricultural programme	-	√	√	√	√	√		
<b>1.1.2 Livestock Development</b>	• No of viable units of smallscale dairy established	-	128.0	128.0	256.0	256.0	256.0	<ul style="list-style-type: none"> <li>• Progress reports</li> <li>• M/E reports</li> <li>• MTR</li> <li>• Special studies PCR</li> </ul>	<ul style="list-style-type: none"> <li>• The Governors of participating zobas</li> <li>• APDD</li> <li>• Agriculture Division of participating zobas</li> <li>• Beneficiaries</li> </ul>
	• Two milk collection/marketing centres established	-	1	1	-	-	-		
	• No of WHH having access to extensive backyard poultry (and each maintain 25-30 birds for income and nutrition)	300	800	3,000	6000	8000	10000		
	• Community Animal Health workers system improved and brought under beneficiary management	√	√	√	√	√	√		
	• 14 clinics facilities are improved to store and distribute veterinary drugs and vaccines	7	14	14	14	14	14		
	• Area of range improved (ha)	1500	5000	15000	25000	35000	45000		
	• No of livestock watering points developed	2	5	8	10	10	10		
	• tonnes of meat produced	-	-	14	19	24	36		
	• Litres of milk produced	27,000	54,000	574,560	1,200,000	1,200,000	1,200,000		
	• Bio-mass production yield increased (kg/ha)	5000	7000	10000	15000	20000	25000		

		Targets							
<b>Output 2: Institution Development – ICT</b>	• Information and Communication Technology – LAN/WAN established to provide production and marketing information widely	1	3	3	3	3	3	<ul style="list-style-type: none"> <li>• Progress reports</li> <li>• M/E reports</li> <li>• PCR</li> <li>• Audit report</li> </ul>	<ul style="list-style-type: none"> <li>• NPCO</li> <li>• PCO – Zoba Gash Barka/ Debub</li> <li>• MOA – Accounts Dept</li> </ul>
	• Staff trained at national and zoba levels in hardware and software management	5	20	30	40	50	60		
	• The generality of technical, accounting, and administrative staff trained to improve their computer application knowledge	20	50	100	150	200	250		
	• AWPB regularly submitted and found satisfactory	1	2	3	4	5	6		
	• Progress reports; M/E reports, audits reports produced and submitted on schedule	3	7	11	15	19	23		
	• Project completion report produced and submitted.	-	-	-	-	-	1		
	• Mid-Term Review	-	-	-	1	-	-	<ul style="list-style-type: none"> <li>• Progress Report</li> <li>• Completion Report</li> </ul>	NPCO
	• Annual Implementation Review workshop held	1	2	3	4	5	6	Progress report, M/E report, MTR, PCR	NPCO, PCOs
	• Establishment of Seed Production Committee	1	1	1	1	1	1	Progress report, M/E report, MTR, PCR	Hon. Minister of Agriculture

## **COST TABLES AND FINANCING PLAN**

### **I. OVERVIEW AND ASSUMPTIONS**

1. The cost tables have been arranged into three parts; (i) Financing Plan, (ii) summary cost tables; (iii) Detailed Cost Tables. The detailed cost tables are arranged into 3 Packages; (a) National Level Package, (b) Zoba Debub package and (c) Gash Barka Package.

#### **A. Overview of the Financing Plan**

2. The total programme add-on costs have been estimated at USD 17,666,000 to be financed by (i) GOE USD 2,491,000; (ii) IFAD USD 8,000,000; (iii) EU USD 5,820,000; and (iv) Beneficiary Contribution USD 1,355,000. The EU funding is to be channeled through and administered by IFAD following the Fund's procedures.

3. The IFAD and EU funding will not be disbursed on a *Pari Passu* basis; and this is reflected in the financing plan by expenditure categories. As can be seen in the financing plan by expenditure categories; IFAD with the required GOE and beneficiary contributions will exclusively finance all the civil works, animal health drugs; trainings workshops and studies; Technical Assistance. The EU on the other hand will exclusively finance with the required GOE and beneficiary contributions vehicles, seeds, fertilizers, sprays/ fungicides and the necessary equipment hire costs. The only category that seems to have some intersection between the EU and IFAD is the other equipment; but the detailed cost tables show exactly what equipment is fundable under EU and what is fundable under IFAD; therefore even here it should not be construed as *pari passu*.

4. From the foregoing paragraph; there will be separate Special Accounts for the EU and IFAD funds.

#### **B. Overview of Summary Cost Tables**

5. The Summary cost tables show the sub-component that is leading in expenditure allocation is Agricultural Production (68% of base costs) followed by Livestock Development (18% of base costs) and Animal Feed and Water Supply (11% of base costs). Programme Implementation Monitoring and evaluation takes up only 3% because the administrative costs have already been covered under the on-going PCRRDP.

6. The spread of expenditure over the Programme Implementation period shows that the bulk of the expenditure commitment will be in Programme Year 1. The Add-on is front loaded to have quick impact of food shortage and soaring food prices. The investments forming the base of sustainable production will also be expedited for completion within the first two year. The key investment are seed procurement; upgrading of seed processing plants at Halhale and Tesenne; Potato Tissue culture Laboratory Equipment and Green House Development; Support for Potato foundation seed Production including some storage civil works at the NARIs and the Zobas, etc as shown in the detailed cost tables.

#### **C. Overview of Detailed Cost Tables**

7. The detailed cost tables have been arranged in three packages; (a) National Level; (b) Zoba Debub and (c) Zoba Gash Barka. The summary of the expected activities under each package is presented below:

## National Level

Table #		USD
1.	Seed Programme (Excluding Potato)	1,532,099
2.	Tissue Culture Support- Laboratory Equipment and Green House Development	271,349
3.	Potato- Pre basic and basic seed production	12,340
4.	Capacity Building for Potato Foundation Seed Production	468,818
5.	Potato Foundation Seed Production	50,568
6.	Potato Certified Seed Production	468,127
7.	Development of Seed System- Institutional Strengthening	979,559
8.	Establishment of WAN and LAN- Information Technology	513,847
9.	Livestock- Poultry Feed and Animal Health Laboratory	<u>2,903,511</u>
		<b><u>7,200,218</u></b>

## Zoba Debub

Table #		USD
10.	Seed Procurement for Programme Year 1; before Programme support seed productive is effective	1,433,203
11.	Irrigation Development investment	3,580,659
12.	Irrigated Crops	2,722,962
13.	Rangeland Development Programme	402,078
14.	Livestock Development Programme including backyard Poultry	1,161,850
15.	Animal Health Services Support	<u>126,043</u>
		<b><u>9,426,795</u></b>

## Zoba Gash Barka

Table #		USD
16.	Seed Procurement Requirement PY1	62,114
17.	Irrigation Development	381,132
18.	Rangeland Development Programme	<u>595,507</u>
		<b><u>1,038,753</u></b>

## D. Assumptions

8. Currency, exchange rate, and Inflation: The official currency is the Eritrean nakfa (ERN), introduced in November 1997. In early 2005, likely in an effort to increase foreign capital reserves, the Eritrean government decreed that all transactions in Eritrea must be conducted in nakfa. There are very tight foreign exchange controls and nationals are not allowed to hold foreign currency. As of January 1, 2005, the government set the foreign exchange rate at USD1=ERN15. This is the exchange rate that has been applied in the costings.

9. Inflation continues to be a problem in Eritrea, particularly as years of drought push grain prices higher and defense expenditures remain high. Since 2003 Inflation has been staggering around 15.5% and therefore for costing purposes inflation rate over the 6 year Programme Period has been assumed at 16%.



## ANNEX II: SUMMARY COST TABLES

Table 1: Components Summary (USD'000)

Eritrea  
PCRDP Expansion Programme  
Components Project Cost Summary

**A. Capacity building & Institutions Strengthening**  
Programme Implementation, Monitoring & evaluation  
**Subtotal Capacity building & Institutions Strengthening**  
**B. Livestock and Agricultural Development**  
Animal Feed & Water Supply  
Livestock Development  
Agricultural Production  
**Subtotal Livestock and Agricultural Development**  
**Total BASELINE COSTS**  
Physical Contingencies  
Price Contingencies  
**Total PROJECT COSTS**

(Nk '000)					(USD '000)				
Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
2,250	5,250	7,500	70	3	150	350	500	70	3
2,250	5,250	7,500	70	3	150	350	500	70	3
15,803	12,998	28,800	45	11	1,054	867	1,920	45	11
23,066	21,714	44,779	48	18	1,553	1,448	3,000	48	18
133,460	37,117	170,577	22	68	8,902	2,474	11,377	22	68
172,328	71,828	244,156	29	97	11,509	4,789	16,297	29	97
174,578	77,078	251,656	31	100	11,659	5,139	16,797	31	100
5,219	1,864	7,082	26	3	348	124	472	26	3
11,956	3,392	15,347	22	6	306	91	397	23	2
191,752	82,334	274,086	30	109	12,313	5,353	17,666	30	105

Table 2: Expenditure Accounts Project Cost Summary (USD'000)

Eritrea

PCRDP Expansion Programme

Expenditure Accounts Project Cost Summary

**I. Investment Costs**

A. Vehicles

B. Civil Works

**C. Equipment, Materials and Machinery**

Seeds

Fertilisers

Sprays/ Fungicides

Animal Drugs

Animals/ Birds

Other Equipments

**Subtotal Equipment, Materials and Machinery**

D. Training, Workshops and Studies

E. Technical Assistance

F. Casual and other Labour costs

G. Equipment Hire Costs

**Total Investment Costs**

**II. Recurrent Costs**

A. Allowances

B. Operations and Maintenance

**Total Recurrent Costs**

**Total BASELINE COSTS**

Physical Contingencies

Price Contingencies

**Total PROJECT COSTS**

(Nk '000)						(USD '000)				
Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	
709	2,836	3,545	80	1	47	189	236	80	1	
81,266	10,916	92,182	12	37	5,433	728	6,161	12	37	
6,241	9,362	15,603	60	6	416	624	1,040	60	6	
8,682	13,023	21,705	60	9	579	868	1,447	60	9	
7,346	11,020	18,366	60	7	490	735	1,224	60	7	
734	1,101	1,835	60	1	49	73	122	60	1	
3,434	5,152	8,586	60	3	229	343	572	60	3	
11,301	22,763	34,064	67	14	753	1,518	2,271	67	14	
37,739	62,420	100,159	62	40	2,516	4,161	6,677	62	40	
6,931	558	7,489	7	3	462	37	499	7	3	
7,164	348	7,513	5	3	483	23	506	5	3	
9,668	-	9,668	-	4	645	-	645	-	4	
29,572	-	29,572	-	12	1,971	-	1,971	-	12	
173,049	77,078	250,127	31	99	11,557	5,139	16,695	31	99	
810	-	810	-	-	54	-	54	-	-	
719	-	719	-	-	48	-	48	-	-	
1,529	-	1,529	-	1	102	-	102	-	1	
174,578	77,078	251,656	31	100	11,659	5,139	16,797	31	100	
5,219	1,864	7,082	26	3	348	124	472	26	3	
11,956	3,392	15,347	22	6	306	91	397	23	2	
191,752	82,334	274,086	30	109	12,313	5,353	17,666	30	105	

Table 3: Expenditure Accounts by Components (USD'000)

	Capacity building & Institutions Strengthening	Livestock and Agricultural Development			Physical Contingencies	
	Programme Implementation, Monitoring & evaluation	Animal Feed & Water Supply	Livestock Development	Agricultural Production	Total	
						% Amount
<b>I. Investment Costs</b>						
A. Vehicles	-	-	133	103	236	- -
B. Civil Works	-	596	1,860	3,705	6,161	4.5 277
<b>C. Equipment, Materials and Machinery</b>						
Seeds	-	278	-	763	1,040	2.0 21
Fertilisers	-	-	-	1,447	1,447	2.5 37
Sprays/ Fungicides	-	-	65	1,159	1,224	2.0 24
Animal Drugs	-	-	122	-	122	2.0 2
Animals/ Birds	-	-	572	-	572	2.0 11
Other Equipments	434	1,000	243	593	2,271	2.0 45
<b>Subtotal Equipment, Materials and Machinery</b>	434	1,278	1,003	3,962	6,677	2.1 141
D. Training, Workshops and Studies	53	8	5	434	499	- -
E. Technical Assistance	13	-	-	493	506	- -
F. Casual and other Labour costs	-	39	-	606	645	1.5 9
G. Equipment Hire Costs	-	-	-	1,971	1,971	2.3 44
<b>Total Investment Costs</b>	500	1,920	3,000	11,275	16,695	2.8 472
<b>II. Recurrent Costs</b>						
A. Allowances	-	-	-	54	54	- -
B. Operations and Maintenance	-	-	-	48	48	- -
<b>Total Recurrent Costs</b>	-	-	-	102	102	- -
<b>Total BASELINE COSTS</b>	500	1,920	3,000	11,377	16,797	2.8 472
Physical Contingencies	9	55	82	326	472	- -
<b>Price Contingencies</b>						
<b>Inflation</b>						
Local	3	92	148	542	785	- -
Foreign	4	15	27	44	91	- -
<b>Subtotal Inflation</b>	7	108	175	586	875	- -
Devaluation	-2	-55	-96	-326	-479	- -
<b>Subtotal Price Contingencies</b>	5	53	79	260	397	2.4 9
<b>Total PROJECT COSTS</b>	514	2,028	3,161	11,963	17,666	2.7 482
Taxes	45	230	328	1,452	2,055	3.2 66
Foreign Exchange	360	899	1,523	2,571	5,353	2.4 126

**Table 4: Project Components by Years- Base Costs (USD'000)**

	Base Cost						
	2010	2011	2012	2013	2014	2015	Total
<b>A. Capacity building &amp; Institutions Strengthening</b>							
Programme Implementation, Monitoring & evaluation	500	-	-	-	-	-	500
<b>Subtotal Capacity building &amp; Institutions Strengthening</b>	500	-	-	-	-	-	500
<b>B. Livestock and Agricultural Development</b>							
Animal Feed & Water Supply	1,282	199	218	83	73	64	1,920
Livestock Development	2,438	371	49	49	49	46	3,000
Agricultural Production	7,209	2,456	1,664	16	16	16	11,377
<b>Subtotal Livestock and Agricultural Development</b>	10,929	3,026	1,930	148	138	126	16,297
<b>Total BASELINE COSTS</b>	11,429	3,026	1,930	148	138	126	16,797
Physical Contingencies	329	85	47	4	4	3	472
<b>Price Contingencies</b>							
<b>Inflation</b>							
Local	277	213	224	20	24	28	785
Foreign	43	15	21	3	4	4	91
<b>Subtotal Inflation</b>	320	228	245	23	28	32	875
Devaluation	-173	-128	-136	-12	-14	-17	-479
Subtotal Price Contingencies	147	100	109	11	13	15	397
<b>Total PROJECT COSTS</b>	11,905	3,212	2,086	163	155	145	17,666
Taxes	1,335	395	274	18	17	16	2,055
Foreign Exchange	4,285	510	423	48	46	41	5,353

**Table 5: Project Components by Year with Contingencies (USD'000)**

	Totals Including Contingencies						Total
	2010	2011	2012	2013	2014	2015	
<b>A. Capacity building &amp; Institutions Strengthening</b>							
Programme Implementation, Monitoring & evaluation	514	-	-	-	-	-	514
<b>Subtotal Capacity building &amp; Institutions Strengthening</b>	514	-	-	-	-	-	514
<b>B. Livestock and Agricultural Development</b>							
Animal Feed & Water Supply	1,328	212	237	93	83	75	2,028
Livestock Development	2,556	393	52	53	54	52	3,161
Agricultural Production	7,506	2,607	1,797	17	18	18	11,963
<b>Subtotal Livestock and Agricultural Development</b>	11,391	3,212	2,086	163	155	145	17,152
<b>Total PROJECT COSTS</b>	11,905	3,212	2,086	163	155	145	17,666

**Table 6: Expenditure Accounts by Years- Base Costs (USD'000)**

	Base Cost						Foreign Exchange		
	2010	2011	2012	2013	2014	2015	Total	%	Amount
<b>I. Investment Costs</b>									
A. Vehicles	236	-	-	-	-	-	236	80.0	189
B. Civil Works	4,032	1,311	672	52	47	46	6,161	11.8	728
<b>C. Equipment, Materials and Machinery</b>									
Seeds	680	145	157	24	21	14	1,040	60.0	624
Fertilisers	1,137	151	158	-	-	-	1,447	60.0	868
Sprays/ Fungicides	763	185	237	13	13	13	1,224	60.0	735
Animal Drugs	122	-	-	-	-	-	122	60.0	73
Animals/ Birds	252	200	30	30	30	30	572	60.0	343
Other Equipments	2,066	119	72	6	6	3	2,271	66.8	1,518
<b>Subtotal Equipment, Materials and Machinery</b>	<b>5,021</b>	<b>801</b>	<b>654</b>	<b>73</b>	<b>69</b>	<b>60</b>	<b>6,677</b>	<b>62.3</b>	<b>4,161</b>
D. Training, Workshops and Studies	269	211	16	2	1	1	499	7.4	37
E. Technical Assistance	234	171	101	-	-	-	506	4.6	23
F. Casual and other Labour costs	543	52	36	6	4	4	645	-	-
G. Equipment Hire Costs	1,073	464	434	-	-	-	1,971	-	-
<b>Total Investment Costs</b>	<b>11,409</b>	<b>3,009</b>	<b>1,913</b>	<b>132</b>	<b>122</b>	<b>110</b>	<b>16,695</b>	<b>30.8</b>	<b>5,139</b>
<b>II. Recurrent Costs</b>									
A. Allowances	9	9	9	9	9	9	54	-	-
B. Operations and Maintenance	11	8	8	7	7	7	48	-	-
<b>Total Recurrent Costs</b>	<b>20</b>	<b>17</b>	<b>17</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>102</b>	<b>-</b>	<b>-</b>
<b>Total BASELINE COSTS</b>	<b>11,429</b>	<b>3,026</b>	<b>1,930</b>	<b>148</b>	<b>138</b>	<b>126</b>	<b>16,797</b>	<b>30.6</b>	<b>5,139</b>
Physical Contingencies	329	85	47	4	4	3	472	26.3	124
<b>Price Contingencies</b>									
<b>Inflation</b>									
Local	277	213	224	20	24	28	785	-	-
Foreign	43	15	21	3	4	4	91	100.0	91
<b>Subtotal Inflation</b>	<b>320</b>	<b>228</b>	<b>245</b>	<b>23</b>	<b>28</b>	<b>32</b>	<b>875</b>	<b>10.3</b>	<b>91</b>
Devaluation	-173	-128	-136	-12	-14	-17	-479	-	-
<b>Subtotal Price Contingencies</b>	<b>147</b>	<b>100</b>	<b>109</b>	<b>11</b>	<b>13</b>	<b>15</b>	<b>397</b>	<b>22.8</b>	<b>91</b>
<b>Total PROJECT COSTS</b>	<b>11,905</b>	<b>3,212</b>	<b>2,086</b>	<b>163</b>	<b>155</b>	<b>145</b>	<b>17,666</b>	<b>30.3</b>	<b>5,353</b>
Taxes	1,335	395	274	18	17	16	2,055	-	-
Foreign Exchange	4,285	510	423	48	46	41	5,353	-	-

**Table 7: Expenditure Accounts by Years with Contingencies (USD'000)**

	Totals Including Contingencies						Total
	2010	2011	2012	2013	2014	2015	
<b>I. Investment Costs</b>							
A. Vehicles	239	-	-	-	-	-	239
B. Civil Works	4,271	1,419	742	58	54	54	6,598
<b>C. Equipment, Materials and Machinery</b>							
Seeds	700	152	168	26	23	16	1,086
Fertilisers	1,179	160	170	-	-	-	1,509
Sprays/ Fungicides	786	195	255	14	15	15	1,279
Animal Drugs	126	-	-	-	-	-	126
Animals/ Birds	260	210	32	33	33	34	603
Other Equipments	2,129	125	77	6	6	3	2,347
<b>Subtotal Equipment, Materials and Machinery</b>	<b>5,180</b>	<b>842</b>	<b>702</b>	<b>80</b>	<b>77</b>	<b>68</b>	<b>6,949</b>
D. Training, Workshops and Studies	272	217	16	2	1	1	510
E. Technical Assistance	240	181	113	-	-	-	534
F. Casual and other Labour costs	556	55	38	6	5	4	664
G. Equipment Hire Costs	1,127	480	457	-	-	-	2,064
<b>Total Investment Costs</b>	<b>11,885</b>	<b>3,194</b>	<b>2,068</b>	<b>146</b>	<b>137</b>	<b>127</b>	<b>17,558</b>
<b>II. Recurrent Costs</b>							
A. Allowances	9	9	9	10	10	10	57
B. Operations and Maintenance	11	8	9	8	8	8	51
<b>Total Recurrent Costs</b>	<b>20</b>	<b>18</b>	<b>18</b>	<b>17</b>	<b>18</b>	<b>18</b>	<b>108</b>
<b>Total PROJECT COSTS</b>	<b>11,905</b>	<b>3,212</b>	<b>2,086</b>	<b>163</b>	<b>155</b>	<b>145</b>	<b>17,666</b>

### ANNEX III: DETAILED FINANCING PLAN

**Table 1: Components by Financiers (USD ‘000)**

	GoE		IFAD		EU		Beneficiary Contribution		Total		For. Exch.	Local (Excl. Taxes)	Duties & Taxes
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%			
<b>A. Capacity building &amp; Institutions Strengthening</b>													
Programme Implementation, Monitoring & evaluation	89	17.4	66	12.9	358	69.7	-	-	514	2.9	360	109	45
<b>B. Livestock and Agricultural Development</b>													
Animal Feed & Water Supply	253	12.5	1,268	62.5	267	13.2	240	11.8	2,028	11.5	899	898	230
Livestock Development	328	10.4	2,118	67.0	714	22.6	-	-	3,161	17.9	1,523	1,309	328
Agricultural Production	1,820	15.2	4,547	38.0	4,481	37.5	1,115	9.3	11,963	67.7	2,571	7,940	1,452
<b>Subtotal Livestock and Agricultural Development</b>	<b>2,402</b>	<b>14.0</b>	<b>7,933</b>	<b>46.3</b>	<b>5,462</b>	<b>31.8</b>	<b>1,355</b>	<b>7.9</b>	<b>17,152</b>	<b>97.1</b>	<b>4,994</b>	<b>10,148</b>	<b>2,010</b>
<b>Total PROJECT COSTS</b>	<b>2,491</b>	<b>14.1</b>	<b>8,000</b>	<b>45.3</b>	<b>5,820</b>	<b>32.9</b>	<b>1,355</b>	<b>7.7</b>	<b>17,666</b>	<b>100.0</b>	<b>5,353</b>	<b>10,257</b>	<b>2,055</b>



Table 2: Expenditure Accounts by Financiers (USD ‘000)

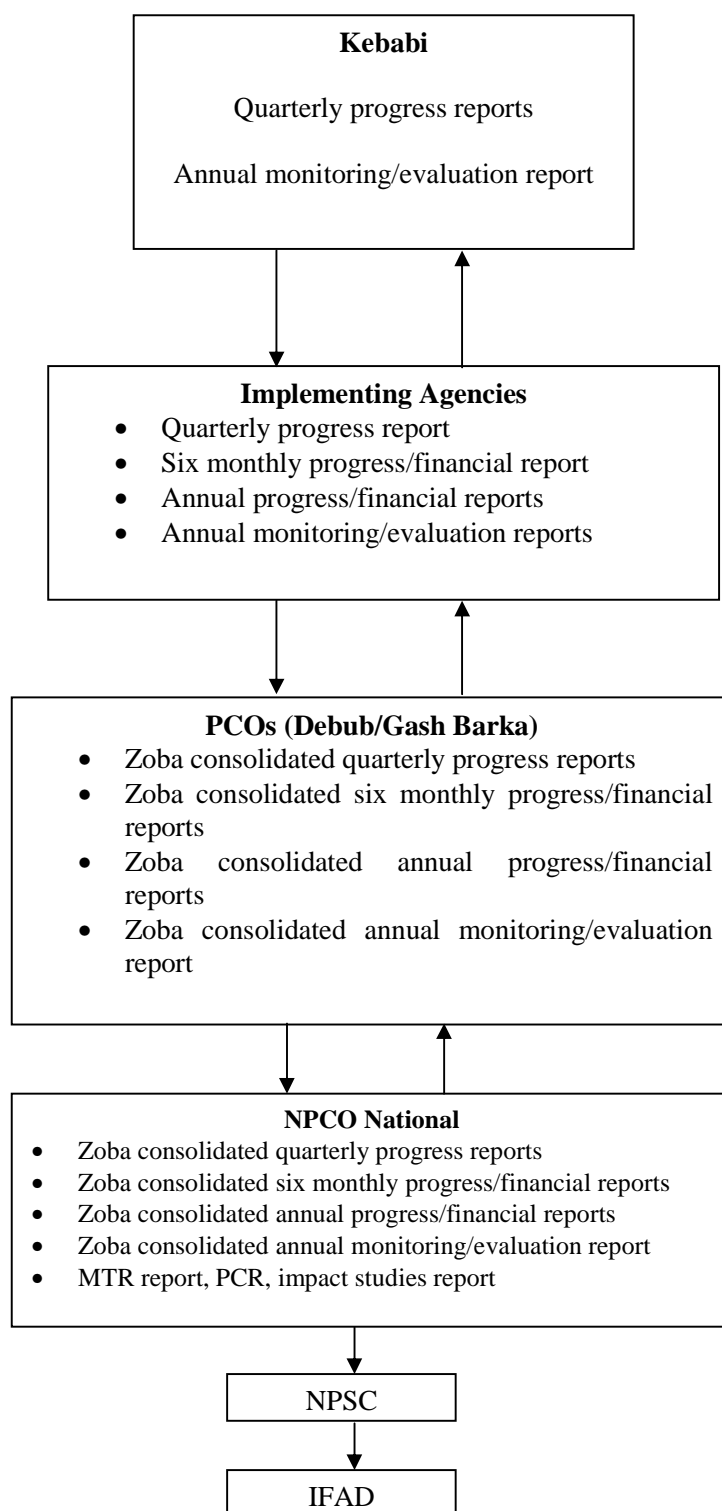
	GoE		IFAD		EU		Beneficiary Contribution		Total		For. Exch.	Local (Excl. Taxes)	Duties & Taxes
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%			
<b>I. Investment Costs</b>													
A. Vehicles	48	20.0	-	-	191	80.0	-	-	239	1.4	191	-	48
B. Civil Works	961	14.6	4,865	73.7	-	-	772	11.7	6,598	37.4	772	4,936	891
<b>C. Equipment, Materials and Machinery</b>													
Seeds	109	10.0	-	-	978	90.0	-	-	1,086	6.1	652	326	109
Fertilisers	151	10.0	245	16.3	1,112	73.7	-	-	1,509	8.5	905	453	151
Sprays/ Fungicides	128	10.0	-	-	1,151	90.0	-	-	1,279	7.2	767	384	128
Animal Drugs	13	10.0	113	90.0	-	-	-	-	126	0.7	76	38	13
Animals/ Birds	60	10.0	-	-	543	90.0	-	-	603	3.4	362	181	60
Other Equipments	279	11.9	1,466	62.5	602	25.6	-	-	2,347	13.3	1,568	544	235
<b>Subtotal Equipment, Materials and Machinery</b>	740	10.6	1,824	26.3	4,385	63.1	-	-	6,949	39.3	4,329	1,925	695
D. Training, Workshops and Studies	-	-	510	100.0	-	-	-	-	510	2.9	38	472	-
E. Technical Assistance	22	4.1	258	48.3	254	47.6	-	-	534	3.0	24	510	-
F. Casual and other Labour costs	299	45.0	-	-	-	-	365	55.0	664	3.8	-	664	-
G. Equipment Hire Costs	413	20.0	538	26.1	896	43.4	218	10.5	2,064	11.7	-	1,651	413
<b>Total Investment Costs</b>	2,482	14.1	7,995	45.5	5,726	32.6	1,355	7.7	17,558	99.4	5,353	10,158	2,046
<b>II. Recurrent Costs</b>													
A. Allowances	-	-	-	-	57	100.0	-	-	57	0.3	-	57	-
B. Operations and Maintenance	9	18.0	5	9.8	37	72.2	-	-	51	0.3	-	42	9
<b>Total Recurrent Costs</b>	9	8.4	5	4.6	94	87.0	-	-	108	0.6	-	99	9
<b>Total PROJECT COSTS</b>	2,491	14.1	8,000	45.3	5,820	32.9	1,355	7.7	17,666	100.0	5,353	10,257	2,055

### ANNEX IV: FIRST 18 MONTHS PROCUREMENT PLAN

Package #	List of Contracts	Lot Number	Estimated Amount \$	ICB	Limited International Bidding	National Competitive Bidding	Consulting Services LCS	Force Account	Community Participation in Procurement
1	<b>VEHICLES</b>			238,022					
	4 WD Vehicles (2 No)	1	70,000						
	Milk Collection Van (1 No)	2	134,350						
	Pick-up truck	3	33,672						
2	<b>GREENHOUSE/ POTATO STORAGE STRUCTURES</b>			459,567					
	Green-House Structure	1	186,967						
	Foundation Seed Storage Structures	2	272,600						
3	<b>IRRIGATION WORKS/ a</b>							2,276,524	
	Pressurised Irrigation	1	872,926						
	Spatte Irrigation	2	1,403,598						
4	<b>CONSTRUCTION OF MILK COLLECTION CENTRES ( 2 No)</b>	1	214,285	214,285					
5	<b>SEEDS</b>			701,000					
	Horticultural Seeds (691kgs)	1	29,968						
	Field Crops (1,055,000 kgs)	2	523,059						
	Spatte Irrigation (9,900 kgs)	3	14,061						
	Grass and Legume Seeds	4	133,912						
6	<b>FERTILISERS</b>			957,000					
	Urea (399,940 kgs)	1	267,960						
	DAP (830,168 kgs)	2	689,040						
7	<b>SPRAYS AND FUNGICIDES</b>			786,000					
	Herbicides (86,460 litres)	1	172,920						
	Insecticides/Fungicides (36,711 kgs)	2	613,080						
8	<b>ASORTED ANIMAL DRUGS</b>			232,858					
	Antibiotics for large animals	1	54,834						
	Anti-fungal drugs	2	970						
	Anthelmintics	3	67,896						
	Anti-ectoparasites	4	23,517						
	Anti-protozoa drugs	5	6,307						
	Miscellaneous drugs	6	16,231						
	Antiseptics/ Disinfectants (639 litres)	7	2,638						
	Hormones (668 mls)	8	4,154						
	Vaccines (210,098 doses)	9	34,959						
	Veterinary Equipment	10	21,352						
9	<b>ANIMALS (228 No)</b>	1	402,921						402,921
10	<b>ASSORTED EQUIPMENT TO UPGRADE PROCESSING PLANTS AT HALHALE AND TESENNEI</b>	1	103,051	103,051					
11	<b>TISSUE CULTURE LAB EQUIPMENT</b>	1	84,383		84,383				
12	<b>HEAVY MACHONERY FOR POTATO FOUNDATION SEED PRODUCTION</b>	1	109,766	109,766					
13	<b>COMPUTERS AND OFFICE EQUIPMENT</b>					37,298			
	Computers (4 No)	1	10,304						
	Printers (4 No)	2	4,121						
	Steel cabinet (4 No)	3	1,236						
	Office Furniture Sets (14 No)	4	21,637						
14	<b>ICT EQUIPMENT PACKAGE</b>	1	513,847	513,847					
15	<b>MILKING MACHINES (6 No)</b>	1	8772			8772			
16	<b>BEE HIVES (660 No)</b>	1	68,338			68,338			
17	<b>HUMAN RESOURCE</b>						183,675		
	Forage/ grass seed production expert		36,735						
	Horticulture seed expert		36,735						
	Grains/ pulses seed expert		36,735						
	Quality certification officer		36,735						
	Seed Supply Data Management Officer		36,735						
18	<b>EQUIPMENT HIRE COSTS</b>		519,000			519,000			
	<b>TOTALS</b>		<b>7,896,307</b>	<b>4,315,396</b>	<b>84,383</b>	<b>633,408</b>	<b>183,675</b>	<b>2,276,524</b>	<b>402,921</b>

a/ Any related materials to be procured competitively under ICB or NCB depending on amount

## THE FLOW OF PROGRESS, MONITORING/EVALUATION REPORTS



## **APPENDIX 1: DETAILED COST TABLES**

Package I: National Level Development – Detailed Cost Tables  
Package II: Zoba Gash Barka Development – Detailed Cost Tables  
Package III: Zoba Debub Development – Detailed Cost Tables



## PACKAGE I: NATIONAL LEVEL DEVELOPMENT – DETAILED COST TABLES

**Table 1: Seed Production (excluding potato)**

Detailed Costs  
(USD)

**I. Investment Costs**

**A. Seed Programme**

**1. Upgrading Seed Processing Plants at Halhale & Tesenne**

**a. Equipment/ materials**

	Unit	2010	2011	Total	Unit Cost	2010	2011	Total	Expenditures by Financiers			
									GoE	IFAD	EU	Ben
Extension ladder	Piece	2	-	2	150	309	-	309	31	278	-	-
Industrial cabel reel	Piece	2	-	2	176	363	-	363	36	326	-	-
Cordless screw driver	kit	2	-	2	104	214	-	214	21	193	-	-
Socket and tool kits	kit	2	-	2	300	618	-	618	62	556	-	-
Air operated grease gun	piece	2	-	2	37	76	-	76	8	69	-	-
Lever action transfer pump	piece	2	-	2	70	144	-	144	14	130	-	-
Padded overalls medium size	piece	10	-	10	28	288	-	288	29	260	-	-
Safety footwear	pairs	10	-	10	75	773	-	773	77	695	-	-
Electricians tool case	piece	1	-	1	20	21	-	21	2	19	-	-
Fuel pump perkins	piece	1	-	1	1,783	1,837	-	1,837	184	1,653	-	-
Portable bag closer	piece	2	-	2	1,395	2,875	-	2,875	287	2,587	-	-
Grain bags	Piece	100,000	-	100,000		7,212	-	7,212	721	6,491	-	-
Belt conveyer for loading	piece	1	-	1	3,768	3,882	-	3,882	388	3,494	-	-
Air compressor cyclone	Piece	2	-	2	150	309	-	309	31	278	-	-
Thread	cone	5,000	-	5,000	13	68,673	-	68,673	6,867	61,806	-	-
Chemicals /a	litres	500	-	500	30	15,455	-	15,455	1,546	-	13,910	-

**Subtotal Equipment/ materials**

**b. Training**

Overseas training of technician in seed dressing /b	No	1	-	1	6,000	6,061	-	6,061	-	6,061	-	-
Training of operators locally	No	5	-	5	1,000	5,051	-	5,051	-	5,051	-	-
Trainees per diem	No	2	-	2	200	404	-	404	-	404	-	-
Trainers Per diem	No	1	-	1	300	303	-	303	-	303	-	-

**Subtotal Training**

**Subtotal Upgrading Seed Processing Plants at Halhale & Tesenne**

11,819	-	11,819	-	11,819	-	-	-	-
114,870	-	114,870	10,305	90,655	13,910	-	-	-

Detailed Costs  
(USD)

**B. Breeder Seed**

**1. Sorghum**

a. Tractor Services

**b. Fertilizer**

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal Sorghum**

**2. Maize**

a. Tractor Services

**b. Fertilizer**

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal Maize**

**3. Pearl Millet**

a. Tractor Services

**b. Fertilizer**

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal Pearl Millet**

**4. Sesame**

a. Tractor Services

b. Others

c. Seeds

**Subtotal Sesame**

**5. Barley**

a. Tractor Services

**b. Fertilizer**

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal Barley**

**6. Wheat**

a. Tractor Services

**b. Fertilizer**

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal Wheat**

**7. Chick Pea**

a. Tractor Services

**b. Fertilizer**

DAP

c. Labour

d. Processing

**Subtotal Chick Pea**

**8. Lentil/ Faba bean**

a. Tractor Services

**b. Fertilizer**

DAP

c. Labour

d. Processing

**Subtotal Lentil/ Faba bean**

**Subtotal Breeder Seed**

					Expenditures by Financiers							
Unit	2010	2011	Total	Unit Cost	2010	2011	Total	GoE	IFAD	EU	Ben	
Ha	0.1	0.1	0.2	160	17	17	34	7	27	-	-	
Ha	0.1	0.1	0.2	34	4	4	7	1	6	-	-	
Ha	0.1	0.1	0.2	83	9	9	18	2	16	-	-	
					12	13	25	2	22	-	-	
Ha	0.1	0.1	0.2	363	39	39	78	78	-	-	-	
Ha	0.1	0.1	0.2	208	22	23	45	9	36	-	-	
					90	92	182	96	86	-	-	
Ha	0.1	0.1	0.2	192	20	21	41	8	33	-	-	
Ha	0.1	0.1	0.2	34	4	4	7	1	6	-	-	
Ha	0.1	0.1	0.2	83	9	9	18	2	16	-	-	
					12	13	25	2	22	-	-	
Ha	0.1	0.1	0.2	281	30	30	60	60	-	-	-	
Ha	0.1	0.1	0.2	208	22	23	45	9	36	-	-	
					85	86	171	80	91	-	-	
Ha	0.1	0.1	0.2	192	20	21	41	8	33	-	-	
Ha	0.1	0.1	0.2	34	4	4	7	1	6	-	-	
Ha	0.1	0.1	0.2	83	9	9	18	2	16	-	-	
					12	13	25	2	22	-	-	
Ha	0.1	0.1	0.2	363	39	39	78	78	-	-	-	
Ha	0.1	0.1	0.2	301	32	33	64	13	52	-	-	
					103	105	208	101	107	-	-	
Ha	0.01	0.01	0.02	192	2	2	4	1	3	-	-	
Ha	0.01	0.01	0.02	25	0	0	1	1	-	-	-	
Ha	0.01	0.01	0.02	24	0	0	1	0	0	-	-	
					3	3	5	1	4	-	-	
Ha	1	1	2	192	204	208	411	82	329	-	-	
Ha	1	1	2	34	36	36	72	7	65	-	-	
Ha	1	1	2	83	88	90	178	18	160	-	-	
					124	126	250	25	225	-	-	
Ha	1	1	2	289	307	313	619	619	-	-	-	
Ha	1	1	2	208	221	225	446	89	357	-	-	
					854	872	1,726	816	910	-	-	
Ha	1	1	2	192	204	208	411	82	329	-	-	
Ha	1	1	2	34	36	36	72	7	65	-	-	
Ha	1	1	2	83	88	90	178	18	160	-	-	
					124	126	250	25	225	-	-	
Ha	1	1	2	198	210	214	424	424	-	-	-	
Ha	1	1	2	208	221	225	446	89	357	-	-	
					758	773	1,531	621	910	-	-	
Ha	2	2	4	192	407	416	823	165	658	-	-	
Ha	2	2	4	83	176	180	356	36	320	-	-	
Ha	2	2	4	244	518	528	1,046	1,046	-	-	-	
Ha	2	2	4	208	441	450	891	178	713	-	-	
					1,542	1,574	3,116	1,424	1,692	-	-	
Ha	0.5	0.5	1	192	102	104	206	41	165	-	-	
Ha	0.5	0.5	1	83	44	45	89	9	80	-	-	
Ha	0.5	0.5	1	244	129	132	261	261	-	-	-	
Ha	0.5	0.5	1	208	110	113	223	45	178	-	-	
					386	393	779	356	423	-	-	
					3,820	3,898	7,718	3,495	4,223	-	-	

**Detailed Costs**  
(USD)

**C. Foundation Seed**

**1. Sorghum**

a. Tractor Services

b. Fertilizer

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal orghum**

**2. Maize**

a. Tractor Services

b. Fertilizer

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal aize**

**3. Pearl Millet**

a. Tractor Services

b. Fertilizer

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal earl Millet**

**4. Sesame**

a. Tractor Services

b. Others

c. Seeds

**Subtotal esame**

**5. Barley**

a. Tractor Services

b. Fertilizer

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal arley**

**6. Wheat**

a. Tractor Services

b. Fertilizer

Urea

DAP

**Subtotal Fertilizer**

c. Labour

d. Processing

**Subtotal heat**

**7. Chick Pea**

a. Tractor Services

b. Fertilizer

DAP

c. Labour

d. Processing

**Subtotal hick Pea**

**8. Lentil/ Faba bean**

a. Tractor Services

b. Fertilizer

DAP

c. Labour

d. Processing

**Subtotal entil/ Faba bean**

**Subtotal Foundation Seed**

Unit				Unit Cost	Expenditures by Financiers						
	2010	2011	Total		2010	2011	Total	GoE	IFAD	EU	Ben
Ha	-	10	10	160	-	1,732	1,732	346	1,385	-	-
Ha	-	10	10	34	-	363	363	36	326	-	-
Ha	-	10	10	83	-	898	898	90	808	-	-
					-	1,261	1,261	126	1,135	-	-
Ha	-	10	10	363	-	3,928	3,928	3,928	-	-	-
Ha	-	10	10	208	-	2,251	2,251	450	1,801	-	-
					-	9,172	9,172	4,851	4,321	-	-
Ha	-	10	10	192	-	2,078	2,078	416	1,662	-	-
Ha	-	10	10	34	-	363	363	36	326	-	-
Ha	-	10	10	83	-	898	898	90	808	-	-
					-	1,261	1,261	126	1,135	-	-
Ha	-	10	10	281	-	3,041	3,041	3,041	-	-	-
Ha	-	10	10	208	-	2,251	2,251	450	1,801	-	-
					-	8,630	8,630	4,033	4,598	-	-
Ha	-	5	5	192	-	1,039	1,039	208	831	-	-
Ha	-	5	5	34	-	181	181	18	163	-	-
Ha	-	5	5	83	-	449	449	45	404	-	-
					-	630	630	63	567	-	-
Ha	-	5	5	363	-	1,964	1,964	1,964	-	-	-
Ha	-	5	5	301	-	1,629	1,629	326	1,303	-	-
					-	5,262	5,262	2,561	2,701	-	-
Ha	-	1.3	1.3	192	-	270	270	54	216	-	-
Ha	-	1.3	1.3	25	-	35	35	35	-	-	-
Ha	-	1.3	1.3	24	-	34	34	7	27	-	-
					-	339	339	96	243	-	-
Ha	27	27	54	192	5,498	5,610	11,109	2,222	8,887	-	-
Ha	27	27	54	34	959	979	1,938	194	1,744	-	-
Ha	27	27	54	83	2,377	2,425	4,802	480	4,322	-	-
					3,336	3,404	6,740	674	6,066	-	-
Ha	27	27	54	289	8,276	8,444	16,721	16,721	-	-	-
Ha	27	27	54	208	5,957	6,078	12,034	2,407	9,627	-	-
					23,068	23,536	46,604	22,023	24,580	-	-
Ha	27	27	54	192	5,498	5,610	11,109	2,222	8,887	-	-
Ha	27	27	54	34	959	979	1,938	194	1,744	-	-
Ha	27	27	54	83	2,377	2,425	4,802	480	4,322	-	-
					3,336	3,404	6,740	674	6,066	-	-
Ha	27	27	54	198	5,670	5,785	11,456	11,456	-	-	-
Ha	27	27	54	208	5,957	6,078	12,034	2,407	9,627	-	-
					20,462	20,877	41,339	16,758	24,580	-	-
Ha	-	16	16	192	-	3,324	3,324	665	2,660	-	-
Ha	-	16	16	83	-	1,437	1,437	144	1,293	-	-
Ha	-	16	16	244	-	4,225	4,225	4,225	-	-	-
Ha	-	16	16	208	-	3,602	3,602	720	2,881	-	-
					-	12,588	12,588	5,754	6,834	-	-
Ha	-	5	5	192	-	1,039	1,039	208	831	-	-
Ha	-	5	5	83	-	449	449	45	404	-	-
Ha	-	5	5	244	-	1,320	1,320	1,320	-	-	-
Ha	-	5	5	208	-	1,125	1,125	225	900	-	-
					-	3,934	3,934	1,798	2,136	-	-
					43,529	84,338	127,867	57,874	69,994	-	-



Detailed Costs  
(USD)

Detailed Costs (USD)						Expenditures by Financiers						
	Unit	2010	2011	Total	Unit Cost	2010	2011	Total	GoE	IFAD	EU	Ben
D. Certified Seed												
1. Sorghum												
a. Tractor Services	Ha	750	-	750	160	127,279	-	127,279	25,456	-	-	101,823
b. Fertilizer												
Urea	Ha	750	-	750	34	26,649	-	26,649	2,665	23,984	-	-
DAP	Ha	750	-	750	83	66,026	-	66,026	6,603	59,423	-	-
Subtotal Fertilizer						92,675	-	92,675	9,267	83,407	-	-
c. Processing	Ha	750	-	750	208	165,463	-	165,463	33,093	132,370	-	-
Subtotal orghum						385,416	-	385,416	67,816	215,778	-	101,823
2. Maize												
a. Tractor Services	Ha	216	-	216	192	43,988	-	43,988	8,798	-	-	35,190
b. Fertilizer												
Urea	Ha	216	-	216	34	7,675	-	7,675	767	6,907	-	-
DAP	Ha	216	-	216	83	19,015	-	19,015	1,902	17,114	-	-
Subtotal Fertilizer						26,690	-	26,690	2,669	24,021	-	-
c. Processing	Ha	216	-	216	208	47,653	-	47,653	9,531	38,123	-	-
Subtotal aize						118,331	-	118,331	20,997	62,144	-	35,190
3. Pearl Millet												
a. Tractor Services	Ha	250	-	250	192	50,912	-	50,912	10,182	-	-	40,729
b. Fertilizer												
Urea	Ha	250	-	250	34	8,883	-	8,883	888	7,995	-	-
DAP	Ha	250	-	250	83	22,009	-	22,009	2,201	19,808	-	-
Subtotal Fertilizer						30,892	-	30,892	3,089	27,802	-	-
c. Processing	Ha	250	-	250	301	79,814	-	79,814	15,963	63,852	-	-
Subtotal earl Millet						161,618	-	161,618	29,234	91,654	-	40,729
4. Barley												
a. Tractor Services	Ha	300	-	300	192	61,094	-	61,094	12,219	48,875	-	-
b. Fertilizer												
Urea	Ha	300	-	300	34	10,660	-	10,660	1,066	9,594	-	-
DAP	Ha	300	-	300	83	26,410	-	26,410	2,641	23,769	-	-
Subtotal Fertilizer						37,070	-	37,070	3,707	33,363	-	-
c. Labour	Ha	300	-	300	289	91,959	-	91,959	91,959	-	-	-
d. Processing	Ha	300	-	300	208	66,185	-	66,185	13,237	52,948	-	-
Subtotal arley						256,308	-	256,308	121,122	135,186	-	-
5. Wheat												
a. Tractor Services	Ha	300	-	300	192	61,094	-	61,094	12,219	48,875	-	-
b. Fertilizer												
Urea	Ha	300	-	300	34	10,660	-	10,660	1,066	9,594	-	-
DAP	Ha	300	-	300	83	26,410	-	26,410	2,641	23,769	-	-
Subtotal Fertilizer						37,070	-	37,070	3,707	33,363	-	-
c. Labour	Ha	300	-	300	198	63,003	-	63,003	63,003	-	-	-
d. Processing	Ha	300	-	300	208	66,185	-	66,185	13,237	52,948	-	-
Subtotal heat						227,352	-	227,352	92,166	135,186	-	-
6. Chick Pea												
a. Tractor Services	Ha	45	-	45	192	9,164	-	9,164	1,833	-	-	7,331
b. Fertilizer												
DAP	Ha	45	-	45	83	3,962	-	3,962	396	3,565	-	-
c. Processing	Ha	45	-	45	208	9,928	-	9,928	1,986	7,942	-	-
Subtotal hick Pea						23,053	-	23,053	4,215	11,508	-	7,331
7. Onion												
a. Tractor Services	Ha	40	-	40	192	8,146	-	8,146	1,629	-	-	6,517
b. Fertilizer												
Urea	Ha	40	-	40	34	1,421	-	1,421	142	1,279	-	-
DAP	Ha	40	-	40	83	3,521	-	3,521	352	3,169	-	-
Subtotal Fertilizer						4,943	-	4,943	494	4,448	-	-
c. Processing	Ha	40	-	40	208	8,825	-	8,825	1,765	7,060	-	-
Subtotal nion						21,913	-	21,913	3,888	11,508	-	6,517
8. Tomato												
a. Tractor Services	Ha	160	-	160	192	32,583	-	32,583	6,517	-	-	26,067
b. Fertilizer												
Urea	Ha	160	-	160	34	5,685	-	5,685	569	5,117	-	-
DAP	Ha	160	-	160	83	14,086	-	14,086	1,409	12,677	-	-
Subtotal Fertilizer						19,771	-	19,771	1,977	17,794	-	-
c. Processing	Ha	160	-	160	208	35,299	-	35,299	7,060	28,239	-	-
Subtotal omato						87,653	-	87,653	15,553	46,033	-	26,067
Subtotal Certified Seed						1,281,644	-	1,281,644	354,991	708,996	-	217,657
Total						1,443,863	88,236	1,532,099	426,665	873,867	13,910	217,657

\a Apron star of thiram or carboxin/Thiram water dispensable

\b One month training

**Table 2: Tissue Culture Support: Lab Equipment and Green House Development**

Detailed Costs	Unit	Quantities						Total	Unit Cost (USD)	Totals Including Contingencies (USD)								GoE	IFAD	EU
		2009	2010	2011	2012	2013	2014			2009	2010	2011	2012	2013	2014	Total				
I. Investment Costs																				
A. Laboratory Support																				
Chemicals- assorted	Assorted									15,998	-	-	-	-	-	15,998	1,600	14,398	-	
Membrane pressure tanks for water 75 ltrs	No	1	-	-	-	-	-	1	800	824	-	-	-	-	-	824	82	742	-	
Storage tank /a	pcs	1	-	-	-	-	-	1	6,000	6,182	-	-	-	-	-	6,182	618	5,564	-	
Booster pump /b	pcs	1	-	-	-	-	-	1	2,000	2,061	-	-	-	-	-	2,061	206	1,855	-	
Pure water distribution blocks SG RT No. 1703-2	pcs	5	-	-	-	-	-	5	500	2,576	-	-	-	-	-	2,576	258	2,318	-	
Deionizers SG 6200	pcs	2	-	-	-	-	-	2	2,000	4,121	-	-	-	-	-	4,121	412	3,709	-	
Racks for culture test tubes /c	pcs	30	-	-	-	-	-	30	14	433	-	-	-	-	-	433	43	389	-	
Glass bead sterilizer	pcs	3	-	-	-	-	-	3	450	1,391	-	-	-	-	-	1,391	139	1,252	-	
Lamp holders (double) with electronic balances	pcs	70	-	-	-	-	-	70	80	5,770	-	-	-	-	-	5,770	577	5,193	-	
Grolux cook white fluorsecent lamps 40 w	pcs	200	-	-	-	-	-	200	20	4,121	-	-	-	-	-	4,121	412	3,709	-	
Lifeguard vented vessels (for microtuberaization)	pcs	2,000	-	-	-	-	-	2,000	5	10,304	-	-	-	-	-	10,304	1,030	9,273	-	
Trolleys	pcs	2	-	-	-	-	-	2	1,000	2,061	-	-	-	-	-	2,061	206	1,855	-	
Timer switches	pcs	30	-	-	-	-	-	30	120	3,709	-	-	-	-	-	3,709	371	3,338	-	
Automatic media dispenser /d	pcs	1	-	-	-	-	-	1	2,500	2,576	-	-	-	-	-	2,576	258	2,318	-	
Bottle to dispenser /e	pcs	3	-	-	-	-	-	3	500	1,546	-	-	-	-	-	1,546	155	1,391	-	
ELISA Plate reader	pcs	1	-	-	-	-	-	1	4,000	4,121	-	-	-	-	-	4,121	412	3,709	-	
Sample homogenizer	pcs	1	-	-	-	-	-	1	3,000	3,091	-	-	-	-	-	3,091	309	2,782	-	
Incubator with orbital shaker with accessories	pcs	1	-	-	-	-	-	1	6,500	6,697	-	-	-	-	-	6,697	670	6,028	-	
Orbital shaker	pcs	2	-	-	-	-	-	2	1,800	3,709	-	-	-	-	-	3,709	371	3,338	-	
Digital stereo microscope	pcs	2	-	-	-	-	-	2	1,000	2,061	-	-	-	-	-	2,061	206	1,855	-	
Gel Electrophoresis system /f	pcs	1	-	-	-	-	-	1	1,000	1,030	-	-	-	-	-	1,030	103	927	-	
Subtotal Laboratory Support										84,383	-	-	-	-	-	84,383	8,438	75,945	-	
B. Greenhouse																				
Greenhouse structure	sq meter	300	-	-	-	-	-	300	300	95,459	-	-	-	-	-	95,459	14,319	81,140	-	
Technical Assistance	Month	2	-	-	-	-	-	2	15,000	30,305	-	-	-	-	-	30,305	-	30,305	-	
Stationery bences	Pcs	100	-	-	-	-	-	100	250	25,759	-	-	-	-	-	25,759	2,576	23,183	-	
Plastic pots 30 cm	Pcs	1,000	-	-	-	-	-	1,000	10	10,304	-	-	-	-	-	10,304	1,030	9,273	-	
Transplant trays	Pcs	1,000	-	-	-	-	-	1,000	10	10,304	-	-	-	-	-	10,304	1,030	9,273	-	
Plastic boxes for greenhouse planting	Pcs	1,000	-	-	-	-	-	1,000	10	10,304	-	-	-	-	-	10,304	1,030	9,273	-	
ULV sprayers	Pcs	2	-	-	-	-	-	2	200	412	-	-	-	-	-	412	41	371	-	
Gardening implements	Ls	1	-	-	-	-	-	1	1,000	1,030	-	-	-	-	-	1,030	103	927	-	
Sacks	Pcs	1	-	-	-	-	-	1	1,000	1,030	-	-	-	-	-	1,030	103	927	-	
Fertilizers and nutrient solutions	Ls	1	-	-	-	-	-	1	2,000	2,061	-	-	-	-	-	2,061	206	-	1,855	
Subtotal Greenhouse										186,967	-	-	-	-	-	186,967	20,439	164,673	1,855	
Total										271,349	-	-	-	-	-	271,349	28,877	240,617	1,855	

\a Polythene, 500 lt capacity, with built inlevel control to activate reverse osmosis

\b 1.5 hp constant pressure with accessories to fit into a water treatment system

\c inoxizabale metal racks

\d peristaltic pump action with capacity 0.5 - 10 ltrs

\e capacity 1 - 50 ml

\f horizontal with accessories and reagents

**Table 3: Potato- Pre basic and Basic Seed Production**

Detailed Costs		Quantities							Cost (USD)	Totals Including Contingencies (USD)									
		Unit	2009	2010	2011	2012	2013	2014		Total	2009	2010	2011	2012	2013	2014	Total	GoE	IFAD
I. Investment Costs																			
A. Laboratory/ Greenhouse																			
Media preparation	Chemicals- Ls	1	-	-	-	-	-	1	2,588	2,666	-	-	-	-	-	2,666	267	2,400	-
In vitro plant establishment	Barrels	2,550	-	-	-	-	-	2,550		184	-	-	-	-	-	184	18	166	-
Greenhouse production of minitubers	Quintal	10	-	-	-	-	-	10	100	1,030	-	-	-	-	-	1,030	103	927	-
Labour costs /a	Man days	720	-	-	-	-	-	720	3	2,422	-	-	-	-	-	2,422	2,422	-	-
Plant protection- insecticides/ fungicides	litres/kg	2	-	-	-	-	-	2	35	72	-	-	-	-	-	72	7	-	65
Total Investment Costs										6,375 - - - - - 6,375 2,817 3,493 65									
II. Recurrent Costs																			
A. Running laboratory activities	man-month	12	12	12	-	-	-	36	100	1,212	1,237	1,262	-	-	-	3,711	668	3,043	-
B. Fuel for standby generator	fuel- litres	300	-	-	-	-	-	300	1	324	-	-	-	-	-	324	58	266	-
C. Maintenance	Ls									2,020	-	-	-	-	-	2,020	364	1,657	-
Total Recurrent Costs										3,557 1,237 1,262 - - - 6,055 1,090 4,965 -									
Total										9,931 1,237 1,262 - - - 12,430 3,907 8,458 65									

/a Transplanting, weeding, irrigation, rogueing, pesticide application, harvesting, cleaning and grading

**Table 4: Capacity Building for Potato Foundation Seed Production**

Detailed Costs		Unit	Quantities							Unit Cost (USD)	Totals Including Contingencies (USD)										GoE	IFAD	EU
			2009	2010	2011	2012	2013	2014	Total		2009	2010	2011	2012	2013	2014	Total						
I. Investment Costs																							
A. Civil Works (NARI)																							
Store (DLS) 200tn capacity	sqm	500	-	-	-	-	-	500	200	106,066	-	-	-	-	-	106,066	15,910	90,156	-				
Working area/ sorting and packaging shed	sqm	100	-	-	-	-	-	100	67	7,075	-	-	-	-	-	7,075	1,061	6,013	-				
Establishment of farm tool shed	sqm	20	-	-	-	-	-	20	200	4,243	-	-	-	-	-	4,243	636	3,606	-				
Well	No	1	-	-	-	-	-	1	5,000	5,303	-	-	-	-	-	5,303	795	4,508	-				
Water pump	No	1	-	-	-	-	-	1	4,000	4,243	-	-	-	-	-	4,243	636	3,606	-				
Pipes	No	100	-	-	-	-	-	100	200	21,213	-	-	-	-	-	21,213	3,182	18,031	-				
Subtotal Civil Works (NARI)										148,142	-	-	-	-	-	148,142	22,221	125,921	-				
B. Civil Works (Zoba)																							
Store (DLS) 300tn capacity	sqm	480	-	-	-	-	-	480	200	101,823	-	-	-	-	-	101,823	15,273	86,550	-				
Working area/ sorting and packaging shed	sqm	200	-	-	-	-	-	200	67	14,149	-	-	-	-	-	14,149	2,122	12,027	-				
Establishment of farm tool shed	sqm	40	-	-	-	-	-	40	200	8,485	-	-	-	-	-	8,485	1,273	7,212	-				
Subtotal Civil Works (Zoba)										124,458	-	-	-	-	-	124,458	18,669	105,789	-				
C. Equipment																							
Potato planter	No	1	-	-	-	-	-	1	13,333	13,738	-	-	-	-	-	13,738	1,374	12,364	-				
Potato digger	No	1	-	-	-	-	-	1	13,333	13,738	-	-	-	-	-	13,738	1,374	12,364	-				
Grader and packing unit	No	1	-	-	-	-	-	1	26,667	27,476	-	-	-	-	-	27,476	2,748	24,728	-				
Pesticide sprayers motorized	No	5	-	-	-	-	-	5	667	3,435	-	-	-	-	-	3,435	343	3,091	-				
Pesticide sprayers knapsack	No	10	-	-	-	-	-	10	53	549	-	-	-	-	-	549	55	494	-				
Pick-up truck	No	1	-	-	-	-	-	1	33,333	33,672	-	-	-	-	-	33,672	6,734	-	26,937				
Tractor	No	1	-	-	-	-	-	1	23,333	24,042	-	-	-	-	-	24,042	2,404	21,637	-				
Disc harrow	No	1	-	-	-	-	-	1	8,000	8,243	-	-	-	-	-	8,243	824	7,419	-				
Disc plough	No	1	-	-	-	-	-	1	7,333	7,556	-	-	-	-	-	7,556	756	6,800	-				
Ridger	No	1	-	-	-	-	-	1	6,667	6,869	-	-	-	-	-	6,869	687	6,182	-				
Leveler	No	1	-	-	-	-	-	1	4,000	4,121	-	-	-	-	-	4,121	412	3,709	-				
Subtotal Equipment										143,438	-	-	-	-	-	143,438	17,711	98,790	26,937				
D. Capacity Building																							
Training on field inspection and disease identification	man days	5	-	-	-	-	-	5	250	1,263	-	-	-	-	-	1,263	-	1,263	-				
Per diem for trainees (20)	man days	100	-	-	-	-	-	100	50	5,051	-	-	-	-	-	5,051	-	5,051	-				
Training materials	LS									1,010	-	-	-	-	-	1,010	-	1,010	-				
Overseas training on seed potato production systems /a	Person year	3	-	-	-	-	-	3	15,000	45,457	-	-	-	-	-	45,457	-	45,457	-				
Subtotal Capacity Building										52,780	-	-	-	-	-	52,780	-	52,780	-				
Total										468,818	-	-	-	-	-	468,818	58,601	383,280	26,937				

/a 2 staff for M.Sc. Course

**Table 5: Potato Foundation Seed Production**

**Detailed Costs**

**I. Investment Costs**

**A. NARI Production managment**

Land preparation /a  
 Irrigation-fuel /b  
 Irrigation- lubricants /c  
 Fertilization- Urea /d  
 Fertilization DAP /e  
 Rogueing (Trained Labour) /f  
 Bags /g  
 Tags /h  
 Plant protection insectide /i  
 Harvesting /j  
 Storage- insecticide  
 Storage- fungicide  
 Storage- labour /k  
 Distribution- sacks  
 Distribution- truck  
 Cultural practices- labour and implements  
 Supervision- monitoring /l

Unit	Quantities							Cost	Totals Including Contingencies (USD)										GoE	IFAD	EU
	2009	2010	2011	2012	2013	2014	Total(USD)	2009	2010	2011	2012	2013	2014	Total							
Ha	6	30	-	-	-	-	36	40	242	1,237	-	-	-	-	1,479	296	-	1,183			
Ha	2	10	-	-	-	-	12	55	113	578	-	-	-	-	692	69	-	622			
Ha	2	10	-	-	-	-	12	7	14	69	-	-	-	-	83	8	-	75			
Ha	2	10	-	-	-	-	12	210	433	2,208	-	-	-	-	2,640	264	-	2,376			
Ha	2	10	-	-	-	-	12	166	342	1,745	-	-	-	-	2,087	209	-	1,878			
Ha	2	10	-	-	-	-	12	67	135	691	-	-	-	-	826	826	-	-			
Ha	2	10	-	-	-	-	12	27	55	280	-	-	-	-	334	33	-	301			
Ha	2	10	-	-	-	-	12		0	1	-	-	-	-	1	0	-	1			
Ha	2	10	-	-	-	-	12	283	584	2,978	-	-	-	-	3,562	356	-	3,206			
Ha	2	10	-	-	-	-	12	24	29	148	-	-	-	-	178	36	-	142			
Ha	2	10	-	-	-	-	12	12	24	122	-	-	-	-	146	15	-	132			
Ha	2	10	-	-	-	-	12	8	17	88	-	-	-	-	105	10	-	94			
Ha	2	10	-	-	-	-	12	594	1,200	6,122	-	-	-	-	7,322	7,322	-	-			
Ha	2	10	-	-	-	-	12	1.000	2,061	10,513	-	-	-	-	12,573	1,257	-	11,316			
Ha	2	10	-	-	-	-	12	266	548	2,796	-	-	-	-	3,345	334	-	3,010			
Ha	2	10	-	-	-	-	12	350	708	3,610	-	-	-	-	4,318	4,318	-	-			
Ha	2	10	-	-	-	-	12	800	1,616	8,245	-	-	-	-	9,861	0	9,861	-			
									8,122	41,432	-	-	-	-	50,568	15,354	9,861	24,338			

\a 5 hours of tractor per Ha each \$8

\b 50 litres per ha each \$ 1.1

\c 2 litres per ha each \$ 3.3

\d 300 kg per ha each \$ 0.70

\e 200 Kgs per ha each \$ 0.83

\f 10 days per ha each \$ 6.7

\g 20 pieces per ha each \$ 1.33

\h 500 pieces per Ha each \$ 0.10

\i Dimethoate or chloropyriphos and fungicide, sprayers and yellow traps

\j 3 tractors hours per ha each \$ 8

\k 180 days per ha at \$ 3.3

\l transportation and perdiem

**Table 6: Potato Certified Seed Production**

Detailed Costs		Quantities							Cost	Totals Including Contingencies (USD)									
Unit		2009	2010	2011	2012	2013	2014	Total	(USD)	2009	2010	2011	2012	2013	2014	Total	GoE	EU	Ben
<b>I. Investment Costs</b>																			
<b>A. Debub/ Gash Barka</b>																			
Land preparation /a	Ha	6	30	-	-	-	-	36	80	485	2,474	-	-	-	-	2,958	592	2,367	-
Planting	Ha	50	-	-	-	-	-	50	2,667	134,687	-	-	-	-	-	134,687	-	-	134,687
Irrigation-fuel /b	Ha	50	8.4	41.9	-	-	-	100.3	320	16,486	2,826	14,382	-	-	-	33,693	3,369	30,324	-
Irrigation- lubricants /c	Ha	50	8.4	41.9	-	-	-	100.3	33	1,700	291	1,483	-	-	-	3,475	347	3,127	-
Fertilization- Urea /d	Ha	50	8.4	41.9	-	-	-	100.3	2	108	19	94	-	-	-	221	22	199	-
Fertilization DAP /e	Ha	50	8.4	41.9	-	-	-	100.3	2	86	15	75	-	-	-	175	17	157	-
Bags /f	Ha	50	8.4	41.9	-	-	-	100.3	27	1,370	235	1,195	-	-	-	2,801	280	2,521	-
Tags /g	Ha	50	8.4	41.9	-	-	-	100.3	200	10,304	1,766	8,988	-	-	-	21,058	2,106	18,952	-
Plant protection insectide /h	Ha	50	8.4	41.9	-	-	-	100.3	590	30,395	5,210	26,516	-	-	-	62,121	6,212	55,909	-
Harvesting /i	Ha	30	5.04	25.14	-	-	-	60.18	24	727	125	634	-	-	-	1,486	297	1,189	-
Storage- insecticide	Ha	50	8.4	41.9	-	-	-	100.3	47	2,401	412	2,094	-	-	-	4,907	491	4,416	-
Storage- fungicide	Ha	50	8.4	41.9	-	-	-	100.3	33	1,721	295	1,501	-	-	-	3,517	352	3,165	-
Storage- labour /j	Ha	50	8.4	41.9	-	-	-	100.3	594	30,001	5,143	26,172	-	-	-	61,316	61,316	-	-
Distribution- sacks	Ha	50	8.4	41.9	-	-	-	100.3	1,000	51,518	8,831	44,942	-	-	-	105,291	10,529	94,762	-
Distribution- truck	Ha	30	5.04	25.14	-	-	-	60.18	266	8,061	1,382	7,032	-	-	-	16,475	3,295	13,180	-
<b>Total</b>										<b>290,049</b>	<b>29,021</b>	<b>135,110</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>468,127</b>	<b>89,226</b>	<b>230,268</b>	<b>134,687</b>

\a 5 hours of tractor per Ha each \$16

\b 300 litres per ha each \$ 1.07

\c 10 litres per ha each \$ 3.3

\d 3 kg per ha each \$ 0.70

\e 2 Kgs per ha each \$ 0.83

\f 20 pieces per ha each \$ 1.33

\g 2000 pieces per Ha each \$ 0.10

\h Dimethoate or chloropyriphos and fungicide, sprayers and yellow traps

\i 3 tractors per ha each \$ 8

\j 180 days per ha at \$ 3.3

**Table 7: Development of Seed System- Institutional Strengthening**

Detailed Costs (USD)	Unit	Quantities						Unit Cost	Totals Including Contingencies							Expenditures by Financiers		
		2010	2011	2012	2013	2014	2015		2010	2011	2012	2013	2014	2015	Total	GoE	IFAD	EU
<b>I. Investment Costs</b>																		
<b>A. Staffing /a</b>																		
Forage/ grass seed production expert	Staff-p.a	3	3	-	-	-	-	6	6,000	18,183	18,552	-	-	-	36,735	-	36,735	-
Horticulture seed expert	Staff-p.a	3	3	-	-	-	-	6	6,000	18,183	18,552	-	-	-	36,735	-	36,735	-
Grains/ pulses seed expert	Staff-p.a	3	3	-	-	-	-	6	6,000	18,183	18,552	-	-	-	36,735	-	36,735	-
Quality certification officer	Staff-p.a	1	1	-	-	-	-	2	6,000	6,061	6,184	-	-	-	12,245	-	12,245	-
Seed Supply Data Management Officer	Staff-p.a	3	3	-	-	-	-	6	2,400	7,273	7,421	-	-	-	14,694	-	14,694	-
<b>Subtotal Staffing</b>									67,882	69,260	-	-	-	-	137,142	-	137,142	-
<b>B. Vehicles</b>	4WD	2	-	-	-	-	-	2	35,000	70,711	-	-	-	-	70,711	14,142	-	56,568
<b>C. Equipment and Materials</b>																		
Computers and Accessories	No	4	-	-	-	-	-	4	2,500	10,304	-	-	-	-	10,304	1,030	-	9,273
Printers	No	4	-	-	-	-	-	4	1,000	4,121	-	-	-	-	4,121	412	-	3,709
Steel Cabinet	No	4	-	-	-	-	-	4	300	1,236	-	-	-	-	1,236	124	-	1,113
Office Sets	No	14	-	-	-	-	-	14	1,500	21,637	-	-	-	-	21,637	2,164	-	19,474
<b>Subtotal Equipment and Materials</b>									37,299	-	-	-	-	-	37,299	3,730	-	33,569
<b>D. Training (Formal)</b>																		
Post graduate (Msc in grains seed production)	PM	-	18	-	-	-	-	18	1,200	-	22,262	-	-	-	22,262	-	22,262	-
Post graduate (Msc in horticulture seed production)	PM	-	18	-	-	-	-	18	1,200	-	22,262	-	-	-	22,262	-	22,262	-
Short Term courses /b	PM	6	6	6	-	-	-	18	1,500	9,091	9,276	9,464	-	-	27,831	-	27,831	-
Others- local training/ workshops /c	LS	1	1	1	-	-	-	3	5,000	5,051	5,153	5,258	-	-	15,462	-	15,462	-
<b>Subtotal Training (Formal)</b>									14,142	58,954	14,722	-	-	-	87,818	-	87,818	-
<b>E. ICARDA Coordination Seed Review Workshop</b>																		
External Facilitators from CGIARs /d	Tickets	5	-	-	-	-	-	5	2,200	11,112	-	-	-	-	11,112	-	-	11,112
DSA for External Facilitators /e	Man- Days	25	-	-	-	-	-	25	135	3,409	-	-	-	-	3,409	-	-	3,409
DSA for national participants /f	Man-Days	100	-	-	-	-	-	100	20	2,020	-	-	-	-	2,020	-	-	2,020
Stationery and other workshop costs	Workshop	1	-	-	-	-	-	1	10,000	10,102	-	-	-	-	10,102	-	-	10,102
<b>Subtotal ICARDA Coordination Seed Review Workshop</b>									26,643	-	-	-	-	-	26,643	-	-	26,643
<b>F. ICARDA Technical Backstopping</b>	Ls	-	1	-	-	-	-	1	25,000	-	25,766	-	-	-	25,766	-	25,766	-
<b>G. Fast Track Variety Introduction Trial</b>																		
Direct Site Trial Costs	Zoba	5	5	-	-	-	-	10	20,000	101,015	103,066	-	-	-	204,081	-	204,081	-
Trial Related Overheads	Ls	1	1	-	-	-	-	2	25,000	25,254	25,766	-	-	-	51,020	-	51,020	-
<b>Subtotal Fast Track Variety Introduction Trial</b>									126,269	128,832	-	-	-	-	255,101	-	255,101	-
<b>H. VBSE- Mobilisation of Farmers /g</b>																		
Facilitation to Farmers /h	Farmers	125	-	-	-	-	-	125	43	5,472	-	-	-	-	5,472	-	5,472	-
Zoba Staff /i	DSA	45	-	-	-	-	-	45	25	1,136	-	-	-	-	1,136	-	1,136	-
Facilitator from ICARDA	Man-Months	0.5	-	-	-	-	-	0.5	6,000	3,030	-	-	-	-	3,030	-	3,030	-
<b>Subtotal VBSE- Mobilisation of Farmers</b>									9,639	-	-	-	-	-	9,639	-	9,639	-
<b>I. Implementation Support Services</b>																		
Management Backstopping /j	Semester	2	2	2	-	-	-	6	33,493	72,137	75,743	79,531	-	-	227,411	-	-	227,411
<b>Total Investment Costs</b>									424,720	358,555	94,253	-	-	-	877,528	17,872	515,466	344,191
<b>II. Recurrent Costs</b>																		
<b>A. Monitoring/ Supervision</b>																		
Seed/ planting material committee	Day	30	30	30	30	30	30	180	200	6,061	6,184	6,309	6,438	6,568	6,702	38,262	-	38,262
Vehicle operation expenses	Ls	2	2	2	2	2	2	12	3,500	7,071	7,215	7,361	7,510	7,663	7,818	44,639	8,035	36,604
Supervision costs (5 committee members)	Ls	1	1	1	1	1	1	6	3,000	3,030	3,092	3,155	3,219	3,284	3,351	19,131	-	19,131
<b>Total Recurrent Costs</b>									16,162	16,490	16,825	17,167	17,515	17,871	102,031	8,035	-	93,996
<b>Total</b>									440,882	375,046	111,078	17,167	17,515	17,871	979,559	25,907	515,466	438,187

<sup>a</sup> From 2012, there will be a fully integrated seed program funded by GoE and a new IFAD programme

<sup>b</sup> 3 months short courses for officers with Msc or above

<sup>c</sup> 3 months short courses for officers with Msc or above

<sup>d</sup> ICRISAT (1), CIP (1), ICBA (1), ICARDA (2) . 4 participants return ticket- \$ 2000; and 1 participant return ticket \$ 3000

<sup>e</sup> Five participants for five days, based on the UN rate

<sup>f</sup> 20 national participants expected; for five days. Participants will be drawn from NARI, APDD, and the five Zobas

<sup>g</sup> 25 farmers from each Zoba targeted at five staff from each Zoba.

<sup>h</sup> 25 farmers from each of the 5 Zobas-to participate in two-day consensus meetings

<sup>i</sup> 3 days provision for five staff from 5 Zobas

<sup>j</sup> Procurement, Financial Management, M& E

**Table 8: Information Technology**

Eritrea  
PCRRDP Add-on Programme  
Table 8. Information Technology (ICT)  
**Detailed Costs**

**I. Investment Costs**

**A. Establishment of WAN and LAN**

**1. Establishment of WAN and LAN**

Set up of the basic infrastructure (HQ, NARI & Zobas)  
Internet and e-mail connectivity  
Dell Power Edge 6850 Server Computers with accessories  
Dell Power Edge Powerful Computers with accessories  
Web-Site Server  
Capacity Building

**Subtotal Establishment of WAN and LAN**

**2. Crop monitoring and remote sensing**

Geo-explorer III Trimble with accessories  
One Work Station of type Dell Dimension 9300  
One Smart UPS 1000  
Software Quotations  
Digitizer III CALCOMP 48x60 A 0  
Acquisition of Satellite Imagery  
Capacity building (training)  
Mapping of livelihood system in Zobas  
Printer accessories

**Subtotal Crop monitoring and remote sensing**

**Total**

															Financiers				
Quantities								Unit Cost	Totals Including Contingencies (USD)										
Unit	2009	2010	2011	2012	2013	2014	Total	(USD)	2009	2010	2011	2012	2013	2014	Total	Total	GoE	IFAD	EU
Set									76,246	-	-	-	-	-	76,246	15,249	-	-	60,997
Quintal									25,759	-	-	-	-	-	25,759	5,152	-	-	20,607
Computers	14	-	-	-	-	-	14	6.000	86,550	-	-	-	-	-	86,550	17,310	-	-	69,240
Computers	84	-	-	-	-	-	84	2.000	173,099	-	-	-	-	-	173,099	34,620	-	-	138,479
Server	1	-	-	-	-	-	1	25.000	25,759	-	-	-	-	-	25,759	5,152	-	-	20,607
Ls									26,264	-	-	-	-	-	26,264		26,264	26,264	-
									413,677	-	-	-	-	-	413,677	77,483	26,264	26,264	309,930
Set	1	-	-	-	-	-	1	3.600	3,709	-	-	-	-	-	3,709	742	-	-	2,967
Ls									5,111	-	-	-	-	-	5,111	1,022	-	-	4,088
Ls									902	-	-	-	-	-	902	180	-	-	721
Ls									35,292	-	-	-	-	-	35,292	7,058	-	-	28,233
Ls									5,263	-	-	-	-	-	5,263	1,053	-	-	4,210
Ls									8,243	-	-	-	-	-	8,243	1,649	-	-	6,594
Ls									27,408	-	-	-	-	-	27,408	0	27,408	27,408	-
Ls									12,796	-	-	-	-	-	12,796	0	12,796	12,796	-
Ls									1,448	-	-	-	-	-	1,448	290	-	-	1,158
									100,171	-	-	-	-	-	100,171	11,993	40,204	40,204	47,973
									513,847	-	-	-	-	-	513,847	89,476	66,468	66,468	357,903



**Table 9: Livestock- Poultry Feed and Animal Health Laboratory**

Table 9. Livestock- National Level Support

**Detailed Costs**

(USD)

	Unit			Unit Cost	Expenditures by Financiers			
		2010	Total		2010	Total	GoE	IFAD
<b>I. Investment Costs</b>								
<b>A. Support to Poultry Feed <sup>a</sup></b>								
1. Purchase of Sorghum	Quintals	15,385	15,385	65	1,030,379	1,030,379	103,038	927,341
2. Transportation for Sorghum	Quintals	15,385	15,385	8	118,890	118,890	11,889	107,001
<b>Subtotal Support to Poultry Feed</b>					1,149,269	1,149,269	114,927	1,034,342
<b>B. National Animal and Plant Health Laboratory</b>								
<b>1. Unfinished Work- Group 1</b>								
Remaining Building Works	Building	1	1	455.960	483,617	483,617	92,855	390,763
Water tank and distribution system	System	1	1	80.320	85,192	85,192	16,357	68,835
Transformer house and Generator	Set	1	1	240.840	255,449	255,449	49,046	206,403
Sanitary Installation to Building	System	1	1	2.300	2,440	2,440	468	1,971
Incenerator House	House	1	1	13.700	14,531	14,531	2,790	11,741
Change Rooms	Rooms	1	1	1.980	2,100	2,100	403	1,697
Dog Kernel	Ls				10,734	10,734	2,061	8,673
<b>Subtotal Unfinished Work- Group 1</b>					854,063	854,063	163,980	690,083
<b>2. Unfinished Work- Group II</b>								
Two Guard House	Package	1	1	28.950	30,706	30,706	-	30,706
Main building, old lab, extension to entrance	Package	1	1	39.600	42,002	42,002	-	42,002
Paristology	Package	1	1	96.760	102,629	102,629	-	102,629
Sample reception room	Package	1	1	69.130	73,323	73,323	-	73,323
Site works and perimeter fencing	Package	1	1	605.000	651,519	651,519	-	651,519
<b>Subtotal Unfinished Work- Group II</b>					900,179	900,179	-	900,179
<b>Subtotal National Animal and Plant Health Laboratory</b>					1,754,242	1,754,242	163,980	1,590,262
<b>Total</b>					2,903,511	2,903,511	278,907	2,624,604

<sup>a</sup> Related Poultry support such as importation of pullets is provided for under FAO assistance

## PACKAGE II: ZOBA DEBUB DEVELOPMENT – DETAILED COST TABLES

**Table 10: Seed Procurement PY1**

Detailed Costs		Quantities							Cost (USD)	Totals Including Contingencies (USD)									
		Unit	2009	2010	2011	2012	2013	2014		Total	2009	2010	2011	2012	2013	2014	Total	GoE	EU
I. Investment Costs																			
A. Horticultural Crops																			
1. Pepper																			
Seed	Ha	165	-	-	-	-	-	-	165	42	7,072	-	-	-	-	-	7,072	707	6,365
Fertilisers	Ha	500	-	-	-	-	-	-	500	233	120,036	-	-	-	-	-	120,036	12,004	108,033
Chemicals	Ha	500	-	-	-	-	-	-	500	103	53,187	-	-	-	-	-	53,187	5,319	47,868
Subtotal Pepper											180,295	-	-	-	-	-	180,295	18,030	162,266
2. Swiss Chard																			
Seed	Ha	124	-	-	-	-	-	-	124	27	3,437	-	-	-	-	-	3,437	344	3,093
Fertilisers	Ha	400	-	-	-	-	-	-	400	233	96,029	-	-	-	-	-	96,029	9,603	86,426
Chemicals	Ha	400	-	-	-	-	-	-	400	103	42,549	-	-	-	-	-	42,549	4,255	38,295
Subtotal Swiss Chard											142,015	-	-	-	-	-	142,015	14,202	127,814
3. Lettuce																			
Seed	Ha	84	-	-	-	-	-	-	84	42	3,652	-	-	-	-	-	3,652	365	3,287
Fertilisers	Ha	400	-	-	-	-	-	-	400	233	96,029	-	-	-	-	-	96,029	9,603	86,426
Chemicals	Ha	400	-	-	-	-	-	-	400	103	42,549	-	-	-	-	-	42,549	4,255	38,295
Subtotal Lettuce											142,231	-	-	-	-	-	142,231	14,223	128,008
4. Cabbage																			
Seed	Ha	124	-	-	-	-	-	-	124	37	4,676	-	-	-	-	-	4,676	468	4,209
Fertilisers	Ha	400	-	-	-	-	-	-	400	233	96,029	-	-	-	-	-	96,029	9,603	86,426
Chemicals	Ha	400	-	-	-	-	-	-	400	103	42,549	-	-	-	-	-	42,549	4,255	38,295
Subtotal Cabbage											143,255	-	-	-	-	-	143,255	14,325	128,929
5. Onion																			
Seed	Ha	69	-	-	-	-	-	-	69	44	3,107	-	-	-	-	-	3,107	311	2,796
Fertilisers	Ha	300	-	-	-	-	-	-	300	233	72,022	-	-	-	-	-	72,022	7,202	64,820
Chemicals	Ha	300	-	-	-	-	-	-	300	103	31,912	-	-	-	-	-	31,912	3,191	28,721
Subtotal Onion											107,041	-	-	-	-	-	107,041	10,704	96,337
6. Tomato																			
Seed	Kg	125	-	-	-	-	-	-	125	62	8,024	-	-	-	-	-	8,024	802	7,221
Fertilisers	Ha	500	-	-	-	-	-	-	500	233	120,036	-	-	-	-	-	120,036	12,004	108,033
Chemicals	Ha	500	-	-	-	-	-	-	500	103	53,187	-	-	-	-	-	53,187	5,319	47,868
Subtotal Tomato											181,247	-	-	-	-	-	181,247	18,125	163,122
7. Field Crop																			
Sorghum	Kg	24,000	-	-	-	-	-	-	24,000	1	25,470	-	-	-	-	-	25,470	2,547	22,923
Maize	Ha	30,000	-	-	-	-	-	-	30,000	1	46,057	-	-	-	-	-	46,057	4,606	41,451
Finger Millet	Ha	40,000	-	-	-	-	-	-	40,000	1	27,613	-	-	-	-	-	27,613	2,761	24,852
Barley	Ha	102,000	-	-	-	-	-	-	102,000	2	167,103	-	-	-	-	-	167,103	16,710	150,392
Wheat	Ha	120,000	-	-	-	-	-	-	120,000	2	196,591	-	-	-	-	-	196,591	19,659	176,932
Chick Pea	Ha	40,000	-	-	-	-	-	-	40,000	1	54,815	-	-	-	-	-	54,815	5,481	49,333
Pearl Millet	Ha	7,500	-	-	-	-	-	-	7,500	1	5,409	-	-	-	-	-	5,409	541	4,868
Subtotal Field Crop											523,059	-	-	-	-	-	523,059	52,306	470,753
8. Spate Irrigation																			
Maize	Kg	7,500	-	-	-	-	-	-	7,500	1	11,514	-	-	-	-	-	11,514	1,151	10,363
Sorghum	Ha	2,400	-	-	-	-	-	-	2,400	1	2,547	-	-	-	-	-	2,547	255	2,292
Subtotal Spate Irrigation											14,061	-	-	-	-	-	14,061	1,406	12,655
Total											1,433,203	-	-	-	-	-	1,433,203	143,320	1,289,888

**Table 11: Irrigation Development Investment**

Detailed Costs		Quantities							Unit Cost (USD)	Totals Including Contingencies (USD)									
		Unit	2009	2010	2011	2012	2013	2014		Total	2009	2010	2011	2012	2013	2014	Total	GoE	IFAD
I. Investment Costs																			
A. Pressurised Irrigation																			
1. Survey/design /a	Ha	160	-	-	-	-	-	160	150,00	24,244	-	-	-	-	-	24,244	9,697	14,546	-
2. Construction contract /b	Ha	-	110	50	-	-	-	160	7,333,00	-	872,926	404,839	-	-	-	1,277,765	191,665	1,086,100	-
3. Supervision of construction/Certification	Person day	-	110	50	-	-	-	160	170,00	-	19,273	8,938	-	-	-	28,212	5,642	22,569	-
Subtotal Pressurised Irrigation										24,244	892,199	413,778	-	-	-	1,330,221	207,005	1,123,216	-
B. Spate Irrigation																			
1. Survey/design	Staff day	1,984	-	-	-	-	-	1,984	150,00	315,652	-	-	-	-	-	315,652	47,348	238,492	29,812
2. Construction contract /c	Ls	1,984	-	-	-	-	-	1,984	667,00	1,403,598	-	-	-	-	-	1,403,598	280,720	1,122,878	-
3. Stone collection	Person day	1,984	-	-	-	-	-	1,984	106,00	212,439	-	-	-	-	-	212,439	-	-	212,439
4. Land Levelling	Ls	-	500	1,484	-	-	-	1,984	131,00	-	70,883	214,653	-	-	-	285,536	42,830	-	242,706
5. Supervision of construction/Certification	Person day	-	500	1,484	-	-	-	1,984	16,00	-	8,245	24,969	-	-	-	33,214	6,643	26,571	-
Subtotal Spate Irrigation										1,931,688	79,129	239,621	-	-	-	2,250,438	377,540	1,387,942	484,956
Total										1,955,932	971,328	653,399	-	-	-	3,580,658	584,545	2,511,158	484,956

\a Staff time/labour

\b Includes installation of pressurised irrigation pipes, pumps and accessories

\c Includes headworks, farm embankments, farm outlet structures

Table 12: Irrigated Crops

Detailed Costs (USD)	Expenditures by Financiers											
	Unit	2010	2011	2012	Total	Unit Cost	2010	2011	2012	Total	GoE	EU
<b>I. Investment Costs</b>												
<b>A. Irrigated Crops</b>												
<b>1. Tomato</b>												
a. Ploughing/Harrowing	Ha	250	30	55	335	100,20	25,304	3,098	5,795	34,198	6,840	27,358
<b>b. Fertilizer</b>												
Urea	Ha	250	30	55	335	166,00	42,760	5,235	9,793	57,788	5,779	52,009
DAP	Ha	250	30	55	335	67,00	17,258	2,113	3,953	23,324	2,332	20,992
<b>Subtotal Fertilizer</b>							60,018	7,348	13,745	81,112	8,111	73,001
c. Seeds	Ha	250	30	55	335	15,58	4,013	491	919	5,424	542	4,881
<b>d. Herbicides</b>												
Dimethoate	Ha	250	30	55	335	46,60	12,004	1,470	2,749	16,222	1,622	14,600
Drusban	Ha	250	30	55	335	23,30	6,002	735	1,375	8,111	811	7,300
<b>Subtotal Herbicides</b>							18,005	2,205	4,124	24,334	2,433	21,900
<b>e. Fungicides</b>												
Mancozet	Ha	250	30	55	335	16,70	4,302	527	985	5,814	581	5,232
Maneb	Ha	250	30	55	335	16,70	4,302	527	985	5,814	581	5,232
Spraying (Diesel)	Ha	250	30	55	335	220,48	56,793	6,954	13,007	76,753	7,675	69,078
<b>Subtotal Fungicides</b>							65,397	8,007	14,977	88,381	8,838	79,543
<b>Subtotal Tomato</b>							172,737	21,149	39,561	233,448	26,765	206,683
<b>2. Onion</b>												
a. Ploughing/Harrowing	Ha	150	30	55	235	100,20	15,183	3,098	5,795	24,076	4,815	19,261
b. Seed	Ha	150	30	55	235	10,05	1,553	317	593	2,463	246	2,217
<b>c. Fertilizer</b>												
Urea	Ha	150	30	55	235	166,00	25,656	5,235	9,793	40,684	4,068	36,616
DAP	Ha	150	30	55	235	67,00	10,355	2,113	3,953	16,421	1,642	14,779
<b>Subtotal Fertilizer</b>							36,011	7,348	13,745	57,105	5,710	51,394
<b>d. Herbicides</b>												
Dimethoate	Ha	150	30	55	235	69,90	10,803	2,205	4,124	17,131	1,713	15,418
Drusban	Ha	150	30	55	235	46,60	7,202	1,470	2,749	11,421	1,142	10,279
<b>Subtotal Herbicides</b>							18,005	3,674	6,873	28,552	2,855	25,697
<b>e. Fungicides</b>												
Mancozet	Ha	150	30	55	235	16,70	2,581	527	985	4,093	409	3,684
Maneb	Ha	150	30	55	235	16,70	2,581	527	985	4,093	409	3,684
Spraying (Diesel)	Ha	150	30	55	235	220,48	34,076	6,954	13,007	54,036	5,404	48,633
<b>Subtotal Fungicides</b>							39,238	8,007	14,977	62,222	6,222	56,000
<b>Subtotal Onion</b>							109,990	22,445	41,984	174,418	19,849	154,569
<b>3. Cabbage</b>												
a. Ploughing/Harrowing	Ha	200	10	24	234	100,20	20,243	1,033	2,529	23,805	4,761	19,044
<b>b. Fertilizer</b>												
Urea	Ha	200	10	24	234	166,00	34,208	1,745	4,273	40,226	4,023	36,203
DAP	Ha	200	10	24	234	67,00	13,807	704	1,725	16,236	1,624	14,612
<b>Subtotal Fertilizer</b>							48,014	2,449	5,998	56,462	5,646	50,816
c. Seed	Ha	200	10	24	234	8,09	1,667	85	208	1,960	196	1,764
<b>d. Herbicides</b>												
Dimethoate	Ha	200	10	24	234	69,90	14,404	735	1,799	16,939	1,694	15,245
Drusban	Ha	200	10	24	234	69,90	14,404	735	1,799	16,939	1,694	15,245
<b>Subtotal Herbicides</b>							28,809	1,470	3,599	33,877	3,388	30,489
<b>e. Fungicides</b>												
Mancozet	Ha	200	10	24	234	16,70	3,441	176	430	4,047	405	3,642
Maneb	Ha	200	10	24	234	16,70	3,441	176	430	4,047	405	3,642
Spraying (Diesel)	Ha	200	10	24	234	220,48	45,434	2,318	5,676	53,428	5,343	48,085
<b>Subtotal Fungicides</b>							52,317	2,669	6,536	61,522	6,152	55,370
<b>Subtotal Cabbage</b>							151,051	7,706	18,869	177,626	20,143	157,483
<b>4. Lettuce</b>												
a. Ploughing/Harrowing	Ha	200	10	17	227	100,20	20,243	1,033	1,791	23,067	4,613	18,454
<b>b. Fertilizer</b>												
Urea	Ha	200	10	17	227	166,00	34,208	1,745	3,027	38,980	3,898	35,082
DAP	Ha	200	10	17	227	67,00	13,807	704	1,222	15,733	1,573	14,160
<b>Subtotal Fertilizer</b>							48,014	2,449	4,249	54,713	5,471	49,241
c. Seed	Ha	200	10	17	227	8,86	1,826	93	162	2,080	208	1,872
<b>d. Herbicides</b>												
Dimethoate	Ha	200	10	17	227	69,90	14,404	735	1,275	16,414	1,641	14,772
Drusban	Ha	200	10	17	227	46,60	9,603	490	850	10,943	1,094	9,848
<b>Subtotal Herbicides</b>							24,007	1,225	2,124	27,356	2,736	24,621
<b>e. Fungicides</b>												
Mancozet	Ha	200	10	17	227	16,70	3,441	176	305	3,921	392	3,529
Maneb	Ha	200	10	17	227	16,70	3,441	176	305	3,921	392	3,529
Spraying (Diesel)	Ha	200	10	17	227	220,48	45,434	2,318	4,020	51,773	5,177	46,595
<b>Subtotal Fungicides</b>							52,317	2,669	4,629	59,616	5,962	53,654
<b>Subtotal Lettuce</b>							146,408	7,469	12,955	166,832	18,990	147,842

**Detailed Costs**  
(USD)

**Expenditures by Financiers**

	Unit	2010	2011	2012	Total	Unit Cost	2010	2011	2012	Total	GoE	EU
<b>5. Swiss Chard</b>												
a. Ploughing/Harrowing	Ha	200	10	17	227	100,20	20,243	1,033	1,791	23,067	4,613	18,454
<b>b. Fertilizer</b>												
Urea	Ha	200	10	17	227	166,00	34,208	1,745	3,027	38,980	3,898	35,082
DAP	Ha	200	10	17	227	67,00	13,807	704	1,222	15,733	1,573	14,160
<b>Subtotal Fertilizer</b>							48,014	2,449	4,249	54,713	5,471	49,241
c. Seed	Ha	200	10	17	227	8,34	1,719	88	152	1,958	196	1,763
<b>d. Herbicides</b>												
Dimethoate	Ha	200	10	17	227	69,90	14,404	735	1,275	16,414	1,641	14,772
Drusban	Ha	200	10	17	227	46,60	9,603	490	850	10,943	1,094	9,848
<b>Subtotal Herbicides</b>							24,007	1,225	2,124	27,356	2,736	24,621
<b>e. Fungicides</b>												
Mancozet	Ha	200	10	17	227	16,70	3,441	176	305	3,921	392	3,529
Maneb	Ha	200	10	17	227	16,70	3,441	176	305	3,921	392	3,529
Spraying (Diesel)	Ha	200	10	17	227	220,48	45,434	2,318	4,020	51,773	5,177	46,595
<b>Subtotal Fungicides</b>							52,317	2,669	4,629	59,616	5,962	53,654
<b>Subtotal Swiss Chard</b>							146,301	7,464	12,946	166,710	18,978	147,732
<b>6. Pepper</b>												
a. Ploughing/Harrowing	Ha	200	30	45	275	100,20	20,243	3,098	4,742	28,083	5,617	22,466
<b>b. Fertilizer</b>												
Urea	Ha	200	30	45	275	166,00	34,208	5,235	8,012	47,455	4,746	42,710
DAP	Ha	200	30	45	275	67,00	13,807	2,113	3,234	19,154	1,915	17,238
<b>Subtotal Fertilizer</b>							48,014	7,348	11,246	66,609	6,661	59,948
c. Seed	Ha	200	30	45	275	13,73	2,829	433	663	3,925	393	3,533
<b>d. Herbicides</b>												
Dimethoate	Ha	200	30	45	275	46,60	9,603	1,470	2,249	13,322	1,332	11,990
Drusban	Ha	200	30	45	275	23,30	4,801	735	1,125	6,661	666	5,995
<b>Subtotal Herbicides</b>							14,404	2,205	3,374	19,983	1,998	17,984
<b>e. Fungicides</b>												
Mancozet	Ha	200	30	45	275	16,70	3,441	527	806	4,774	477	4,297
Maneb	Ha	200	30	45	275	16,70	3,441	527	806	4,774	477	4,297
Spraying (Diesel)	Ha	200	30	45	275	220,48	45,434	6,954	10,642	63,030	6,303	56,727
<b>Subtotal Fungicides</b>							52,317	8,007	12,254	72,578	7,258	65,320
<b>Subtotal Pepper</b>							137,809	21,091	32,279	191,178	21,926	169,252
<b>Subtotal Irrigated Crops</b>							864,296	87,323	158,593	1,110,212	126,651	983,562
<b>B. Spate Irrigation</b>												
<b>1. Maize</b>												
a. Ploughing/Harrowing	Ha	250	1,000	1,000	2,250	200,40	50,609	206,543	210,736	467,888	93,578	374,311
<b>b. Fertilizer</b>												
Urea	Ha	250	1,000	1,000	2,250	77,11	19,863	81,063	82,709	183,635	18,363	165,271
DAP	Ha	250	1,000	1,000	2,250	31,16	8,026	32,758	33,423	74,207	7,421	66,786
<b>Subtotal Fertilizer</b>							27,889	113,821	116,131	257,841	25,784	232,057
<b>c. Herbicides</b>												
Attrazine	Ha	250	1,000	1,000	2,250	15,65	4,031	16,452	16,786	37,270	3,727	33,543
2-4D	Ha	250	1,000	1,000	2,250	7,85	2,022	8,252	8,420	18,695	1,869	16,825
<b>Subtotal Herbicides</b>							6,053	24,705	25,206	55,964	5,596	50,368
<b>d. Insecticides</b>												
Fungicides	Ha	250	1,000	1,000	2,250	30,97	7,978	32,558	33,219	73,754	7,375	66,379
Thiram	Ha	250	1,000	1,000	2,250	6,33	1,631	6,655	6,790	15,075	1,507	13,567
<b>Subtotal Insecticides</b>							9,608	39,212	40,008	88,829	8,883	79,946
e. Seed	Ha	250	1,000	1,000	2,250	44,70	11,514	46,992	47,946	106,452	10,645	95,806
<b>Subtotal Maize</b>							105,673	431,273	440,028	976,975	144,486	832,488
<b>2. Sorghum</b>												
a. Ploughing/Harrowing	Ha	200	1,000	1,000	2,200	200,40	40,487	206,543	210,736	457,767	91,553	366,213
<b>b. Herbicides</b>												
Attrazine	Ha	200	1,000	1,000	2,200	15,65	3,225	16,452	16,786	36,464	3,646	32,817
2-4D	Ha	200	1,000	1,000	2,200	7,85	1,618	8,252	8,420	18,290	1,829	16,461
<b>Subtotal Herbicides</b>							4,843	24,705	25,206	54,754	5,475	49,278
<b>c. Insecticides</b>												
Fungicides	Ha	200	1,000	1,000	2,200	30,97	6,382	32,558	33,219	72,159	7,216	64,943
Thiram	Ha	200	1,000	1,000	2,200	6,33	1,304	6,655	6,790	14,749	1,475	13,274
<b>Subtotal Insecticides</b>							7,686	39,212	40,008	86,907	8,691	78,216
d. Seed	Ha	200	1,000	1,000	2,200	15,60	3,215	16,400	16,733	36,347	3,635	32,712
<b>Subtotal Sorghum</b>							56,231	286,860	292,684	635,775	109,354	526,421
<b>Subtotal Spate Irrigation</b>							161,904	718,134	732,712	1,612,749	253,840	1,358,909
<b>Total</b>							1,026,200	805,457	891,305	2,722,962	380,491	2,342,470

**Table 13: Rangeland Development Programme**

Detailed Costs	Unit	Quantities							Unit Cost (USD)	Totals Including Contingencies (USD)										
		2009	2010	2011	2012	2013	2014	Total		2009	2010	2011	2012	2013	2014	Total	GoE	IFAD	EU	Ben
I. Investment Costs																				
A. Establishment of permanent closures																				
Grass Seeds	Kg	300	500	500	-	-	-	1,300	28,00	8,655	14,718	15,017	-	-	-	38,389	3,839	-	34,550	-
Legume Seeds	Kg	700	1,500	1,500	-	-	-	3,700	28,00	20,195	44,153	45,050	-	-	-	109,398	10,940	-	98,458	-
Oversawing and reseeding	Kg	500	1,000	1,000	-	-	-	2,500	1,75	884	1,804	1,840	-	-	-	4,528	2,717	-	-	1,811
Subtotal Establishment of permanent closures										29,734	60,675	61,906	-	-	-	152,315	17,495	-	133,008	1,811
B. Establishment of temporary closures																				
Grass Seeds/ local	Kg	200	400	500	250	250	250	1,850	14,20	2,926	5,971	7,616	3,885	3,964	4,044	28,406	2,841	-	25,566	-
Legume Seeds/ local	Kg	1,000	2,000	2,500	1,500	1,000	1,000	9,000	3,52	3,627	7,401	9,439	5,778	3,930	4,010	34,186	3,419	-	30,767	-
Oversawing and reseeding	Kg	1,000	2,000	2,500	1,500	1,000	1,000	9,000	1,75	1,768	3,607	4,601	2,816	1,916	1,955	16,663	9,998	-	-	6,665
Subtotal Establishment of temporary closures										8,321	16,979	21,655	12,480	9,810	10,009	79,255	16,257	-	56,333	6,665
C. Establishment of permanent closures	Ha	40	80	100	60	40	40	360	20,00	849	1,732	2,208	1,352	920	938	7,998	1,200	4,079	-	2,719
D. Livestock watering points																				
Pond Construction	No	1	2	2	-	-	-	5	25,000,00	26,516	54,109	55,208	-	-	-	135,834	20,375	69,275	-	46,183
Trough Construction	No	2	4	4	-	-	-	10	2,000,00	4,243	8,658	8,833	-	-	-	21,733	3,260	11,084	-	7,389
Subtotal Livestock watering points										30,759	62,767	64,041	-	-	-	157,567	23,635	80,359	-	53,573
E. Training																				
Training of trainers (5 days)	No	12	-	-	12	-	-	24	10,00	121	-	-	129	-	-	250	-	250	-	-
Training of Beneficiaries (3 days)	No	200	200	200	200	100	100	1,000	3,00	606	618	631	644	328	335	3,163	-	3,163	-	-
Subtotal Training										727	618	631	773	328	335	3,413	-	3,413	-	-
F. Supervision	day	48	48	48	48	48	48	288	5,00	242	247	252	258	263	268	1,530	-	1,530	-	-
Total										70,632	143,018	150,694	14,862	11,321	11,551	402,078	58,587	89,381	189,341	64,768

**Table 14: Livestock Development**

Detailed Costs		Quantities							Unit Cost	Totals Including Contingencies (USD)									
Unit		2009	2010	2011	2012	2013	2014	Total	(USD)	2009	2010	2011	2012	2013	2014	Total	GoE	IFAD	EU
<b>I. Investment Costs</b>																			
<b>A. Smallholder Dairy Development</b>																			
Selection of breeds and other inspections	days	240	-	-	-	-	-	240	20,00	4,946	-	-	-	-	-	4,946	495	-	4,451
Distribution of dairy animals	No	128	100	-	-	-	-	228	1,700,00	224,205	178,716	-	-	-	-	402,921	40,292	-	362,629
Management and training of beneficiaries	Groups	13	10	-	-	-	-	23	100,00	1,313	1,031	-	-	-	-	2,344	-	2,344	-
Monitoring/ supervision	Set of ben	1	1	2	2	2	3	11	50,00	51	52	105	107	109	168	592	-	592	-
<b>Subtotal Smallholder Dairy Development</b>										230,514	179,798	105	107	109	168	410,802	40,787	2,935	367,080
<b>B. Provision of milking machines</b>																			
Machines and milk cans	Package	2	4	4	4	4	2	20	1,400,00	2,885	5,887	6,007	6,129	6,253	3,190	30,350	3,035	27,315	-
Training of farmers	Farmer groups	10	20	-	-	-	-	30	30,00	303	618	-	-	-	-	921	-	921	-
<b>Subtotal Provision of milking machines</b>										3,188	6,506	6,007	6,129	6,253	3,190	31,272	3,035	28,237	-
<b>C. Milk Collection</b>																			
Milk collection centres	No	1	1	-	-	-	-	2	100,000,00	106,066	108,219	-	-	-	-	214,285	32,143	182,142	-
Quality Control	p.a	1	1	-	-	-	-	2	50,000,00	51,518	52,563	-	-	-	-	104,081	10,408	93,673	-
Supplies and materials- chemicals	No	-	1	1	1	1	1	5	13,000,00	-	13,666	13,944	14,227	14,516	14,810	71,164	7,116	-	64,047
Training of farmers	No	20	10	-	-	-	-	30	25,00	505	258	-	-	-	-	763	-	763	-
Milk collection van	No	1	-	-	-	-	-	1	133,000,00	134,350	-	-	-	-	-	134,350	26,870	-	107,480
<b>Subtotal Milk Collection</b>										292,438	174,707	13,944	14,227	14,516	14,810	524,642	76,537	276,578	171,527
<b>D. Backyard Poultry</b>																			
Ls										30,911	31,538	32,178	32,832	33,498	34,178	195,134	19,513	-	175,621
<b>Total</b>										557,051	392,548	52,234	53,294	54,376	52,346	1,161,850	139,872	307,750	714,228

**Table 15: Animal Health Services Support**

Detailed Costs (USD)	Expenditures by Financiers			
	2010	Total	GoE	IFAD
<b>I. Investment Costs</b>				
<b>A. Antibiotixs, Medicines, vaccines</b>				
1. Antibiotics for large animals	22,639	22,639	2,264	20,375
2. Antibiotics for poultry	4,502	4,502	450	4,052
3. Anti-fungal drugs	480	480	48	432
4. Anthelmentics	33,607	33,607	3,361	30,246
5. Anti-ectoparsites	11,640	11,640	1,164	10,476
6. Anti-protozoa drugs	3,122	3,122	312	2,810
7. Miscellaneous drugs	8,034	8,034	803	7,230
8. Antiseptics/ Disinfectants	1,306	1,306	131	1,175
9. Hormones	2,056	2,056	206	1,851
10. Vaccines	17,304	17,304	1,730	15,573
11. Veterinary Equipment	21,352	21,352	2,135	19,217
<b>Total</b>	126,043	126,043	12,604	113,439



### PACKAGE III: ZOBA GASH BARKA DEVELOPMENT – DETAILED COST TABLES

Table 16: Seed Procurement Requirement PY1

Detailed Costs	Unit	Quantities							Cost (USD)	Totals Including Contingencies (USD)								GoE	EU
		2009	2010	2011	2012	2013	2014	Total		2009	2010	2011	2012	2013	2014	Total			
I. Investment Costs																			
A. Horticultural Crops																			
Tomato	Kg	18.75	-	-	-	-	-	18.75	62	1,204	-	-	-	-	-	1,204	120	1,083	
Onion	Kg	14.95	-	-	-	-	-	14.95	44	673	-	-	-	-	-	673	67	606	
Pepper	Kg	21.45	-	-	-	-	-	21.45	42	919	-	-	-	-	-	919	92	827	
Subtotal Horticultural Crops											2,796	-	-	-	-	-	2,796	280	2,517
B. Field Crop																			
Sorghum	Kg	24,000	-	-	-	-	-	24,000	1	25,470	-	-	-	-	-	25,470	2,547	22,923	
Maize	Kg	15,000	-	-	-	-	-	15,000	1	23,028	-	-	-	-	-	23,028	2,303	20,726	
Pearl Millet	Kg	15,000	-	-	-	-	-	15,000	1	10,819	-	-	-	-	-	10,819	1,082	9,737	
Subtotal Field Crop											59,317	-	-	-	-	-	59,317	5,932	53,386
Total											62,114	-	-	-	-	-	62,114	6,211	55,902

**Table 17: Irrigation Development**

Detailed Costs	Unit	Quantities							Unit Cost (USD)	Totals Including Contingencies (USD)										
		2009	2010	2011	2012	2013	2014	Total		2009	2010	2011	2012	2013	2014	Total	GoE	IFAD	EU	Ben
I. Investment Costs																				
A. Surface Irrigation																				
1. Design of Scheme	Ha	260	-	-	-	-	-	260	15,00	3,940	-	-	-	-	-	3,940	-	3,940	-	-
2. Digging of wells	Ha	60	200	-	-	-	-	260	834,00	53,075	180,509	-	-	-	-	233,584	35,038	-	-	198,547
3. Water Pumps	Ha	60	200	-	-	-	-	260	117,00	7,233	24,600	-	-	-	-	31,833	3,183	-	28,649	-
4. Galvanised Pipes	Ha	60	200	-	-	-	-	260	47,00	2,906	9,882	-	-	-	-	12,788	1,279	-	11,509	-
5. PVC tube	Ha	60	200	-	-	-	-	260	20,00	1,236	4,205	-	-	-	-	5,442	544	-	4,897	-
6. Land Development	Ha	60	200	-	-	-	-	260	334,00	21,256	72,290	-	-	-	-	93,546	14,032	-	-	79,514
Total										89,646	291,486	-	-	-	-	381,132	54,076	3,940	45,056	278,061

**Table 18: Rangeland Development Programme**

Detailed Costs	Unit	Quantities							Unit Cost (USD)	Totals Including Contingencies (USD)										GoE	IFAD	EU	BEN
		2009	2010	2011	2012	2013	2014	Total		2009	2010	2011	2012	2013	2014	Total							
<b>I. Investment Costs</b>																							
A. Establishment of permanent closures		Ha	500	1,500	2,000	2,000	2,000	-	8,000	0.80	424	1,299	1,767	1,803	1,839	-	7,131	1,070	3,637	-	2,425		
<b>B. Establishment of voluntary livestock exclusion area</b>																							
Seed Procurement		Ha	1,000	2,000	8,000	8,000	8,000	-	27,000	0.80	824	1,682	6,865	7,004	7,146	-	23,521	2,352	-	21,169	-		
Oversawing- Labour		Ha	1,000	2,000	8,000	8,000	8,000	-	27,000	0.10	101	206	841	858	876	-	2,883	-	-	-	2,883		
Grass Seeds/ local		Ha	200	400	500	250	250	250	1,850	14.20	2,926	5,971	7,616	3,885	3,964	4,044	28,406	2,841	-	25,566	-		
Legume Seeds/ local		Ha	1,000	2,000	2,500	1,500	1,000	1,000	9,000	3.52	3,627	7,401	9,439	5,778	3,930	4,010	34,186	3,419	-	30,767	-		
Oversawing and reseeding		Ha	1,000	2,000	2,500	1,500	1,000	1,000	9,000	1.75	1,768	3,607	4,601	2,816	1,916	1,955	16,663	9,998	-	-	6,665		
<b>Subtotal Establishment of voluntary livestock exclusion area</b>											9,246	18,868	29,361	20,342	17,832	10,009	105,658	18,609	-	77,502	9,548		
C. Hillside protection		Ha	-	200	300	500	1,000	1,000	3,000	45.00	-	9,740	14,906	25,348	51,725	52,775	154,493	23,174	78,792	-	52,528		
<b>D. Livestock watering points</b>																							
New Ponds		No	-	1	1	1	-	-	3	25,000.00	-	27,055	27,604	28,164	-	-	82,823	12,423	42,240	-	28,160		
Rehabilitation of old points		No	1	1	1	-	-	-	3	8,000.00	8,485	8,658	8,833	-	-	-	25,976	3,896	13,248	-	8,832		
Troughs construction		No	1	2	2	1	-	-	6	1,400.00	1,485	3,030	3,092	1,577	-	-	9,184	1,378	4,684	-	3,123		
<b>Subtotal Livestock watering points</b>											9,970	38,742	39,529	29,741	-	-	117,983	17,697	60,171	-	40,114		
<b>E. Animal Feed Storage</b>																							
Storage Construction		No	1	-	-	-	-	-	1	195,000.00	206,828	-	-	-	-	-	206,828	31,024	105,482	-	70,322		
Training of trainers (5 days)		No	12	-	-	12	-	-	24	10,00	121	-	-	129	-	-	250	-	250	-	-		
Training of Beneficiaries (3 days)		No	200	200	200	200	100	100	1,000	3.00	606	618	631	644	328	335	3,163	-	3,163	-	-		
<b>Subtotal Animal Feed Storage</b>											207,556	618	631	773	328	335	210,241	31,024	108,895	-	70,322		
<b>Total</b>											227,196	69,267	86,194	78,007	71,724	63,119	595,507	91,574	251,495	77,502	174,936		

**APPENDIX 2: DETAILED COST TABLES FOR EC-FINANCED ACTIVITIES  
(ALL IN EURO)**



<b>Budget for the Action</b>	<b>All Years</b>	<b>Year 1</b>
<b>Costs</b>	<b>Costs (in EUR)</b>	<b>Costs (in EUR)</b>
<b>1. Human Resources</b>		
1.1 Allowances	21,651	7,024
1.2 Incentives for Casual Labour	2,335	747
<b>Subtotal Human Resources</b>	<b>23,986</b>	<b>7,771</b>
<b>3. Equipment and supplies</b>		
3.1 Purchase or rent of vehicles	147,561	147,561
3.2 Seeds	510,325	258,472
3.3 Fertilisers	962,218	732,152
3.4 Sprays/ Fungicides	872,640	601,129
3.5 Animals/ Birds	412,874	222,609
3.6 Other Equipments (ICT, etc)	446,164	391,126
3.7 Equipment Hire Costs	617,446	135,302
<b>Subtotal Equipment and supplies</b>	<b>3,969,228</b>	<b>2,488,351</b>
<b>4. Local office</b>		
4.1 Operations and Maintenance	13,809	5,463
<b>Subtotal Local office</b>	<b>13,809</b>	<b>5,463</b>
<b>5. Other costs, services</b>		
5.1 Evaluation costs, including technical support to Procurement/ Financial Management	178,543	108,000
<b>Subtotal Other costs, services</b>	<b>178,543</b>	<b>108,000</b>
<b>6. Other</b>		
<b>Subtotal Other</b>		
<b>7. Subtotal direct eligible costs of the Action (1-6)</b>	<b>4,185,566</b>	<b>2,609,585</b>
8. Provision for contingency reserve (maximum 5% of 7, subtotal of direct eligible costs of the Action)	206,957	130,479
<b>9. Total direct eligible costs of the Action (7+ 8)</b>	<b>4,392,523</b>	<b>2,740,064</b>
10. Administrative costs (maximum 7% of 9, total direct eligible costs of the Action)	307,477	191,804
<b>11. Total eligible costs (9+10)</b>	<b>4,700,000</b>	<b>2,931,869</b>

## 1.1 ALLOWANCES:

EC Contribution to PCRRDP Expansion Programme

### Detailed Costs

#### Development of Seed System: Institution Strengthening

##### A. Monitoring/ Supervision

Seed/ planting material committee

Supervision costs (5 committee members)

Unit	Quantities				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Day	30	30	30	90	154	4,683	4,810	4,941	14,434
Ls	1	1	1	3	2,310	2,341	2,405	2,471	7,217
									<b>21,651</b>

## 1.2: INCENTIVES FOR CASUAL LABOUR

b. Incentives for Casual Labour: Seed Programme

Unit	Quantities				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Ha	2	55	55	112	19	40	1,132	1,163	<b>2,335</b>

## 3.1 Purchase of Vehicles

EC Contribution to PCRRDP Expansion Programme

### I. Investment Costs

Pick-up truck

Vehicles- Development of Seed System: Institutional Strengthening

Milk collection van

Unit	Quantities					EU			
	2009	2010	2011	Total		2009	2010	2011	Total
No		1	-	-	1	20,812	-	-	20,812
4WD		2	-	-	2	43,706	-	-	43,706
No		1	-	-	1	83,042	-	-	83,042
						147,561			147,561

### 3.2 Seeds

EC Contribution to PCRRDP Expansion Program

	Unit	Quantities/ Targeted Area				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b><u>I. Horticultural Crops- Debub</u></b>										
1. Pepper Seed	Ha	165	-	-	165	32	4,865	-	-	4,865
2. Swiss Chard Seed	Ha	124	-	-	124	21	2,366	-	-	2,366
3. Lettuce Seed	Ha	84	-	-	84	32	2,515	-	-	2,515
4. Cabbage Seed	Ha	124	-	-	124	28	3,220	-	-	3,220
5. Onion Seed	Ha	69	-	-	69	34	2,162	-	-	2,162
6. Tomato Seed	Ha	125	-	-	125	48	5,528	-	-	5,528
7. Field Crop										
Sorghum	Kg	24,000	-	-	24,000	1	17,469	-	-	17,469
Maize	Kg	30,000	-	-	30,000	1	31,787	-	-	31,787
Finger Millet	Kg	40,000	-	-	40,000	1	19,164	-	-	19,164
Chick Pea	Kg	40,000	-	-	40,000	1	37,592	-	-	37,592
Pearl Millet	Kg	7,500	-	-	7,500	1	3,732	-	-	3,732
8. Spate Irrigation										
Maize	Kg	7,500	-	-	7,500	1	7,947	-	-	7,947
Sorghum	Kg	2,400	-	-	2,400	1	1,747	-	-	1,747
<b><u>II. Irrigated Crops Debub</u></b>										
<b>A. Irrigated Crops</b>										
1. Tomato										
c. Seeds	Ha	250	30	55	335	12,00	2,764	341	642	3,746
2. Onion										
b. Seed	Ha	150	30	55	235	8,09	1,118	230	433	1,780
3. Cabbage										
c. Seed	Ha	200	10	24	234	6,23	1,148	59	145	1,352
4. Lettuce										
c. Seed	Ha	200	10	17	227	6,82	1,257	65	113	1,434
5. Swiss Chard										
c. Seed	Ha	200	10	17	227	6,42	1,183	61	106	1,350
6. Pepper										
c. Seed	Ha	200	30	45	275	10,57	1,948	300	462	2,710
B. Spate Irrigation										
1. Maize										
e. Seed	Ha	250	1,000	1,000	2,250	34,42	7,928	33,087	33,973	74,987
2. Sorghum										
e. Seed	Ha	200	1,000	1,000	2,200	12,00	2,211	11,357	11,666	25,234
<b><u>III. Range Land Development- Debub</u></b>										
<b>A. Establishment of permanent closures</b>										
Grass Seeds	Kg	300	500	500	1,300	22,00	6,081	10,411	10,694	27,185
Legume Seeds	Kg	700	1,500	1,500	3,700	22,00	14,189	31,232	32,081	77,502
<b>B. Establishment of temporary closures</b>										
Grass Seeds/ local	Kg	200	825	825	1,850	10,93	2,014	8,534	8,766	19,315
Legume Seeds/ local	Kg	1,000	4,000	4,000	9,000	2,71	2,497	10,259	10,538	23,294
<b><u>IV. Seed Programme Gash Barka</u></b>										
<b>Foundation Seed</b>										
4. Sesame										
c. Seeds	Ha	2	2	2	6	18	34	35	36	106
4. Sesame										
c. Seeds	Ha	-	30	30	60	18	-	531	546	1,077
5. Common Bean										
c. Seeds	Ha	-	22.5	22.5	45	173	-	3,830	3,934	7,764
<b><u>V. Seed Procurement requirement PY1- Gash Barka</u></b>										
<b>A. Horticultural Crops</b>										
Tomato	Kg	18.75	-	-	18.75	48	829	-	-	829
Onion	Kg	14.95	-	-	14.95	34	464	-	-	464
Pepper	Kg	21.45	-	-	21.45	32	632	-	-	632
<b>B. Field Crop</b>										
Sorghum	Kg	24,000	-	-	24,000	1	17,469	-	-	17,469
Maize	Kg	15,000	-	-	15,000	1	15,894	-	-	15,894
Pearl Millet	Kg	15,000	-	-	15,000	1	7,463	-	-	7,463
<b><u>VI. Rangeland Development- Gash Barka</u></b>										
<b>A. Establishment of voluntary livestock e</b>										
Seed Procurement	Ha	1,000	13,000	13,000	27,000	0,62	571	7,628	7,836	16,035
Grass Seeds/ local	Ha	200	825	825	1,850	10,93	2,014	8,534	8,766	19,315
Legume Seeds/ local	Ha	1,000	4,000	4,000	9,000	2,71	2,497	10,259	10,538	23,294
<b>Total</b>							232,297	136,753	141,276	<b>510,325</b>



### 3.3 Fertiliser Summary Sheet

		Euro
Seed Programme Debub	See Sheet 3.3.1	54,850
Horticulture Crops in Debub	See Sheet 3.3.2	412,310
Irrigated Crops Debub	See Sheet 3.3.3	461,180
Seed Programme- Gash Barka	See Sheet 3.3.4	28,905
Tissue Culture Labaratoty	See Sheet 3.3.5	1,419
Potato Foundation Seed	See Sheet 3.3.6	3,279
Potato Certified Seed	See Sheet 3.3.7	275
		962,218

### 3.3.1 Fertiliser need for Debub Seed Programme

EC Contribution to PCRRDP Expansion Programme

						Unit				
						Cost				
						(Euro)				

54850.33

### 3.3.2 Fertiliser Needed for Horticulture Crops- Debub

EC Contribution to PCRRDP Expansion Programme

- I. Investment Costs
  - A. Horticultural Crops
    - 1. **Pepper**
      - Fertilisers
    - 2. **Swiss Chard**
      - Fertilisers
    - 3. **Lettuce**
      - Fertilisers
    - 4. **Cabbage**
      - Fertilisers
    - 5. **Onion**
      - Fertilisers
    - 6. **Tomato**
      - Fertilisers
    - 7. **Field Crop**

Unit	Quantities/ Targeted Area				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Ha	500	-	-	500	179	82,462	-	-	82,462
Ha	400	-	-	400	179	65,970	-	-	65,970
Ha	400	-	-	400	179	65,970	-	-	65,970
Ha	400	-	-	400	179	65,970	-	-	65,970
Ha	300	-	-	300	179	49,477	-	-	49,477
Ha	500	-	-	500	179	82,462	-	-	82,462
									412,310

### 3.3.3 Fertiliser needed for Irrigated Crop in Dehub

EC Contribution to PCRRDP Expansion Programme

		Quantities				Unit Cost (Euro)	EU				
		Unit	2009	2010	2011		Total	2009	2010	2011	Total
I. Investment Costs											
A. Irrigated Crops											
1. Tomato											
b. Fertilzer											
Urea		Ha	250	30	55	335	128,00	29,484	3,634	6,844	39,962
DAP		Ha	250	30	55	335	52,00	11,978	1,476	2,780	16,235
d. Herbicides											
e. Fungicides											
2. Onion											
Urea		Ha	150	30	55	235	128,00	17,690	3,634	6,844	28,168
DAP		Ha	150	30	55	235	52,00	7,187	1,476	2,780	11,443
d. Herbicides											
e. Fungicides											
3. Cabbage											
b. Fertilzer											
Urea		Ha	200	10	24	234	128,00	23,587	1,211	2,986	27,785
DAP		Ha	200	10	24	234	52,00	9,582	492	1,213	11,288
d. Herbicides											
e. Fungicides											
4. Lettuce											
b. Fertilzer											
Urea		Ha	200	10	17	227	128,00	23,587	1,211	2,115	26,914
DAP		Ha	200	10	17	227	52,00	9,582	492	859	10,934
5. Swiss Chard											
b. Fertilzer											
Urea		Ha	200	10	17	227	128,00	23,587	1,211	2,115	26,914
DAP		Ha	200	10	17	227	52,00	9,582	492	859	10,934
d. Herbicides											
e. Fungicides											
6. Pepper											
b. Fertilzer											
Urea		Ha	200	30	45	275	128,00	23,587	3,634	5,600	32,821
DAP		Ha	200	30	45	275	52,00	9,582	1,476	1,616	15,638
d. Herbicides											
e. Fungicides											
B. Spate Irrigation											
1. Maize											
b. Fertilzer											
Urea		Ha	250	1,000	1,000	2,250	59,37	13,675	21,698	-	63,725
DAP		Ha	250	1,000	1,000	2,250	23,99	5,526	22,705	-	39,687
c. Herbicides											
2. Sorghum											
b. Fertilzer											
Urea		Ha	200	1,000	1,000	2,200	59,37	10,940	21,698	-	60,382
DAP		Ha	200	1,000	1,000	2,200	24,00	4,423	22,714	-	38,352
										461,180	

### 3.3.4 Fertiliser Needed for Seed Programme- (

EC Contribution to PCRRDP Expansion Programme

#### Detailed Costs

#### I. Investment Costs

##### A. Breeder Seed

##### 1. Sorghum

##### b. Fertilizer

Urea

DAP

##### 2. Maize

##### b. Fertilizer

Urea

DAP

##### 3. Pear Millet

Urea

DAP

##### B. Foundation Seed

##### 1. Sorghum

Urea

DAP

##### 2. Maize

Urea

DAP

##### 3. Pearl Millet

Urea

DAP

##### C. Certified Seed

##### 1. Sorghum

Urea

DAP

##### 2. Maize

Urea

DAP

##### 3. Pearl Millet

Urea

DAP

Unit	Quantities/ Targeted Area				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Ha	2	2	2	6	26	49	51	52	152
Ha	2	2	2	6	64	123	126	129	378
Ha	2	2	2	6	26	49	51	52	152
Ha	2	2	2	6	64	123	126	129	378
Ha	2	2	2	6	26	49	51	52	152
Ha	2	2	2	6	64	123	126	129	378
Ha	-	7.5	7.5	15	26	-	190	196	386
Ha	-	7.5	7.5	15	64	-	472	485	957
Ha	-	12.5	12.5	25	26	-	317	326	643
Ha	-	12.5	12.5	25	64	-	787	809	1,596
Ha	-	7.5	7.5	15	26	-	190	196	386
Ha	-	7.5	7.5	15	64	-	472	485	957
Ha	-	40	40	80	26	-	1,015	1,043	2,058
Ha	-	40	40	80	64	-	2,519	2,587	5,106
Ha	-	45	45	90	26	-	1,142	1,173	2,316
Ha	-	45	45	90	64	-	2,834	2,911	5,744
Ha	-	40	40	80	26	-	1,015	1,043	2,058
Ha	-	40	40	80	64	-	2,519	2,587	5,106
									28,905

3.3.5 Fertilisers need for Tissue Culture Laboratory  
EC Contribution to PCRRDP Expansion Programme

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b>I. Investment Costs</b>										
<b>A. Greenhouse</b>										
Fertilizers and nutrient solutions	Ls	1	-	-	1	1.540	1,419	-	-	1,419
<b>Total</b>							1,419	-	-	1,419

**3.3.6 Fertiliser needed for Potato Foundation Seed Production**

EC Contribution to PCRRDP Expansion Programme

Detailed Costs	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
A. NARI Production managment										
Fertilization- Urea /d	Ha	2	10	-	12	162	299	1,533	-	1,832
Fertilization DAP /e	Ha	2	10	-	12	128	236	1,211	-	1,447
Total										3,279

\d 300 kg per ha each euro 0.54

\e 200 Kgs per ha each euro 0.64

### 3.3.7 Fertiliser needed for Potato Certified Seed Production

EC Contribution to PCRRDP Expansion Programme

						Unit Cost (Euro)				
Unit	Quantities				EU					
	2009	2010	2011	Total	2009		2010	2011	Total	
<b>A. Debub/ Gash Barka</b>										
Fertilization- Urea /d	Ha	50	8.4	41.9	100.3	2	75	13	66	153
Fertilization DAP /e	Ha	50	8.4	41.9	100.3	1	59	10	52	121
										275

\d 3 kg per ha each euro 0.54

\e 2 Kgs per ha each euro 0.64

### 3.4 Summary for Sprays and Fungicides

Seed Production- National Level	See Sheet 3.4.1	10,596
Table 3. Potato- Pre basic abd basic seed production (Labaratory/ green house)	See Sheet 3.4.2	50
Table 5. Potato Foundation Seed Production	See Sheet 3.4.3	2,641
Table 6. Potato Certified Seed Production	See Sheet 3.4.4	48,854
Table 19. Seed Procurement Requirement in PY1	See Sheet 3.4.5	183,121
Table 11. Irrigated Crops - Debub	See Sheet 3.4.6	589,007
Table 14. Livestock Development	See Sheet 3.4.6	38,372
		872,640

3.4.1 Chemicals needed for Seed Production  
EC Contribution to PCRRDP Expansion Programme

**A. Seed Programme**  
**1. Upgrading Seed Processing Plants at Halhale & Tesenne**  
**a. Equipment/ materials**  
Chemicals /a

**Total**

Unit	Quantities				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
litres	500	-	-	500	23	10,596	-	-	10,596
						10,596	-	-	10,596

\a Apron star of thiram or carboxin/Thiram water dispensable

3.4.2 Chemicals needed for Potato- Pre basic abd basic seed production (Laboratory/ green house)  
 EC Contrubution to PCRRDP Expansion Programme

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b>I. Investment Costs</b>										
<b>A. Laboratory/ Greenhouse</b>										
Plant protection- insecticides/ fungicides	litres/kg	2	-	-	2	27	50	-	-	50
<b>Total</b>							50	-	-	50

**3.4.3 Chemicals needed for**

Potato Foundation Seed Production  
 EC Contrubution to PCRRDP Expansion Programme

**Detailed Costs**

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b>I. Investment Costs</b>										
<b>A. NARI Production managment</b>										
Plant protection insectide /h	Ha	2	10	-	12	218	402	2,065	-	2,467
Storage- inseticide	Ha	2	10	-	12	9	17	85	-	101
Storage- fungicide	Ha	2	10	-	12	6	12	61	-	73
										2,641

\h Dimethoate or chloropyriphos and fungicide, sprayers and yellow traps

**3.4.4 Chemicals needed for**

Potato Certified Seed Production  
 EC Contrubution to PCRRDP Expansion Programme

**Detailed Costs**

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b>I. Investment Costs</b>										
<b>A. Debub/ Gash Barka</b>										
Plant protection insectide /h	Ha	50	8.4	41.9	100.3	454	20,915	3,609	18,493	43,017
Storage- insecticide	Ha	50	8.4	41.9	100.3	36	1,653	285	1,462	3,400
Storage- fungicide	Ha	50	8.4	41.9	100.3	26	1,185	204	1,048	2,437
										48,854

\h Dimethoate or chloropyriphos and fungicide, sprayers and yellow traps



**3.4.5 Chemical Needed for Horticulture Crops**  
EC Contribution to PCRRDP Expansion Program

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b>A. Horticultural Crops</b>										
<b>1. Pepper</b>										
Chemicals	Ha	500	-	-	500	80	36,624	-	-	36,624
<b>2. Swiss Chard</b>										
Chemicals	Ha	400	-	-	400	80	29,299	-	-	29,299
<b>3. Lettuce</b>										
Chemicals	Ha	400	-	-	400	80	29,299	-	-	29,299
<b>4. Cabbage</b>										
Chemicals	Ha	400	-	-	400	80	29,299	-	-	29,299
<b>5. Onion</b>										
Chemicals	Ha	300	-	-	300	80	21,974	-	-	21,974
<b>6. Tomato</b>										
Chemicals	Ha	500	-	-	500	80	36,624	-	-	36,624
										183,121

3.4.6 Chemicals needed for Irrigated Crops Debut  
EC Contribution to PCRRDP Expansion Program

		Quantities				Unit Cost	EU				
	Unit	2009	2010	2011	Total	(Euro)	2009	2010	2011	Total	
I. Investment Costs											
A. Irrigated Crops											
1. Tomato											
	Dimethoate	Ha	250	30	55	335	35,88	8,265	1,019	1,918	11,202
	Drusban	Ha	250	30	55	335	17,94	4,132	509	959	5,601
	Mancozet	Ha	250	30	55	335	12,86	2,962	365	688	4,015
	Maneb	Ha	250	30	55	335	12,86	2,962	365	688	4,015
	Spraying (Diesel)	Ha	250	30	55	335	169,77	39,105	4,820	9,077	53,003
2. Onion											
	Dimethoate	Ha	150	30	55	235	53,82	7,438	1,528	2,878	11,844
	Drusban	Ha	150	30	55	235	35,88	4,959	1,019	1,918	7,896
e. Fungicides											
	Mancozet	Ha	150	30	55	235	12,86	1,777	365	688	2,830
	Maneb	Ha	150	30	55	235	12,86	1,777	365	688	2,830
	Spraying (Diesel)	Ha	150	30	55	235	169,77	23,463	4,820	9,077	37,361
3. Cabbage											
	Dimethoate	Ha	200	10	24	234	53,82	9,918	509	1,256	11,683
	Drusban	Ha	200	10	24	234	53,82	9,918	509	1,256	11,683
e. Fungicides											
	Mancozet	Ha	200	10	24	234	12,86	2,370	122	300	2,792
	Maneb	Ha	200	10	24	234	12,86	2,370	122	300	2,792
	Spraying (Diesel)	Ha	200	10	24	234	169,40	31,216	1,603	3,952	36,771
4. Lettuce											
	Dimethoate	Ha	200	10	17	227	53,82	9,918	509	889	11,316
	Drusban	Ha	200	10	17	227	35,88	6,612	340	593	7,544
	Mancozet	Ha	200	10	17	227	12,86	2,370	122	213	2,704
	Maneb	Ha	200	10	17	227	12,86	2,370	122	213	2,704
	Spraying (Diesel)	Ha	200	10	17	227	169,77	31,284	1,607	2,806	35,696
5. Swiss Chard											
	Dimethoate	Ha	200	10	17	227	53,82	9,918	509	889	11,316
	Drusban	Ha	200	10	17	227	35,88	6,612	340	593	7,544
	Mancozet	Ha	200	10	17	227	12,86	2,370	122	213	2,704
	Maneb	Ha	200	10	17	227	12,86	2,370	122	213	2,704
	Spraying (Diesel)	Ha	200	10	17	227	169,77	31,284	1,607	2,806	35,696
6. Pepper											
	Dimethoate	Ha	200	30	45	275	35,88	6,612	1,019	1,570	9,200
	Drusban	Ha	200	30	45	275	17,94	3,306	509	785	4,600
	Mancozet	Ha	200	30	45	275	12,86	2,370	365	563	3,297
	Maneb	Ha	200	30	45	275	12,86	2,370	365	563	3,297
	Spraying (Diesel)	Ha	200	30	45	275	169,77	31,284	4,820	7,427	43,531
B. Spate Irrigation											
1. Maize											
	Attrazine	Ltr	250	1,000	1,000	2,250	12,05	2,776	11,404	11,715	25,895
	2-4D	Ltr	250	1,000	1,000	2,250	6,00	1,382	5,679	5,833	12,894
	Fungcides	Ha	250	1,000	1,000	2,250	23,85	5,494	22,572	23,186	51,252
	Thiram	Ha	250	1,000	1,000	2,250	4,87	1,122	4,609	4,734	10,465
2. Sorghum											
	Attrazine	Ltr	200	1,000	1,000	2,200	12,00	2,211	11,357	11,666	25,234
	2-4D	Ltr	200	1,000	1,000	2,200	6,04	1,113	5,716	5,872	12,701
	Fungcides	Ha	200	1,000	1,000	2,200	23,85	4,395	22,572	23,186	50,153
	Thiram	Ha	200	1,000	1,000	2,200	4,87	897	4,609	4,734	10,241
										589,007	

3.4.7 Chemicals needed for Livestock Development  
EC Contribution to PCRRDP Expansion Programme

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b>A. Smallholder Dairy Development</b>										
<b>B. Milk Collection</b>										
Supplies and materials- chemicals	Ls/ Centre	-	2	2	4	10.000,00	-	18,928	19,443	38,372

**3.5 Animal/ Birds**

EC Contribution to PCRRDP Expansion Programme

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
<b>A. Smallholder Dairy Development</b>										
Selection of breeds and other inspections	days	240	-	-	240	15,40	3,405	-	-	3,405
Distribution of dairy animals	No	128	100	-	228	1.309,00	154,376	123,887	-	278,263
<b>C. Backyard Poultry</b>	Ls						42,567	43,725	44,914	131,206
										<b>412,874</b>

**3.6 Other Equipments and Materials**

Potato Foundation Seed Production	See sheet 3.6.1	9,787
Potato Certified Seed Production	See sheet 3.6.2	115,208
Information Technology (ICT)	See sheet 3.6.3	260,906
Irrigation Development Investment	See sheet 3.6.4	34,582
Development of Seed System: Institution Strengthening	See sheet 3.6.5	25,682
		<b>446,164</b>

3.6.1 Other Equipment/ Materials needed for  
Potato Foundation Seed Production  
EC Contribution to PCRRDP Expansion Programme

	Unit	Quantities/ Targeted area				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
A. NARI Production management										
Irrigation-fuel /b	Ha	2	10	-	12	42	77	397	-	475
Irrigation- lubricants /c	Ha	2	10	-	12	5	9	47	-	57
Bags /f	Ha	2	10	-	12	20	38	194	-	232
Tags /g	Ha	2	10	-	12		0	1	-	1
Distribution- sacks	Ha	2	10	-	12	593	1,093	5,612	-	6,705
Distribution- truck	Ha	2	10	-	12	205	378	1,940	-	2,318
										9,787

\a 5 hours of tractor per Ha each euro 6

\b 50 litres per ha each euro 0.85

\c 2 litres per ha each euro 2.5

\d 300 kg per ha each euro 0.54

\e 200 Kgs per ha each euro 0.64

\f 20 pieces per ha each euro 1.02

\g 500 pieces per Ha each euro 0.08

\h Dimethoate or chloropyriphos and fungicide, sprayers and yellow traps

\i 3 tractors hours per ha each euro 6.16

**3.6.2 Equipment and Materials needed for**  
Potato Certified Seed Production  
EC Contribution to PCRRDP Expansion Programme

						Unit Cost (Euro)				
Unit	Quantities				EU					
	2009	2010	2011	Total	2009		2010	2011	Total	
I. Investment Costs										
A. Dehub/ Gash Barka										
Irrigation-fuel /b	Ha	50	8.4	41.9	100.3	246	11,333	1,956	10,021	23,309
Irrigation- lubricants /c	Ha	50	8.4	41.9	100.3	25	1,171	202	1,035	2,408
Bags /f	Ha	50	8.4	41.9	100.3	20	943	163	834	1,941
Tags /g	Ha	50	8.4	41.9	100.3	154	7,094	1,224	6,273	14,592
Distribution- sacks	Ha	50	8.4	41.9	100.3	770	35,472	6,121	31,365	72,959
										115,208

a 5 hours of tractor per Ha each euro 12.32

b 300 litres per ha each euro 0.82

c 10 litres per ha each euro 2.54

d 3 kg per ha each euro 0.54

e 2 Kgs per ha each euro 0.64

f 20 pieces per ha each euro 1.02

g 2000 pieces per Ha each euro 0.08

h Dimethoate or chloropyriphos and fungicide, sprayers and yellow traps

i 3 tractors per ha each \$ 6.16

### 3.6.3 ICT Equipment

EC Contribution to PCRRDP Expansion Programme

#### I. Investment Costs

##### A. Establishment of WAN and LAN

##### 1. Establishment of WAN and LAN

Set up of the basic infrastructure (HQ, NARI & Zobas)  
 Internet and e-mail connectivity  
 Dell Power Edge 6850 Server Computers with accessories  
 Dell Power Edge Powerful Computers with accessories  
 Web-Site Server

##### Subtotal Establishment of WAN and LAN

##### 2. Crop monitoring and remote sensing

Geo-explorer III Trimble with accessories  
 One Work Station of type Dell Dimension 9300  
 One Smart UPS 1000  
 Software Quotations  
 Digitizer III CALCOMP 48x60 A 0  
 Acquisition of Satellite Imagery  
 Printer accessories

##### Subtotal Crop monitoring and remote sensing

**Total**

Unit	Quantities				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Set						44,466	-	-	44,466
Quintal						15,022	-	-	15,022
Computers	14	-	-	14	3.913	50,475	-	-	50,475
Computers	84	-	-	84	1.304	100,949	-	-	100,949
Server	1	-	-	1	16.304	15,022	-	-	15,022
						225,934	-	-	225,934
Set	1	-	-	1	2.348	2,163	-	-	2,163
Ls						2,980	-	-	2,980
Ls						526	-	-	526
Ls						20,582	-	-	20,582
Ls						3,069	-	-	3,069
Ls						4,807	-	-	4,807
Ls						844	-	-	844
						34,972	-	-	34,972
						260,906	-	-	260,906

### 3.6.4 Irrigation Equipment

EC Contribution to PCRRDP Expansic

#### I. Investment Costs

##### A. Surface Irrigation

1. Water Pumps  
 2. Galvanised Pipes  
 3. PVC tube

**Total**

Unit	Quantities/ Targeted Area				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Ha	60	200	-	260	90,00	4,975	17,036	-	22,011
Ha	60	200	-	260	36,00	1,990	6,814	-	8,804
Ha	60	200	-	260	15,40	851	2,915	-	3,766
						7,817	26,765	-	34,582

### 3.6.5 Equipment needed for

Development of Seed System: Institution Strengthening

EC Contribution to PCRRDP Expansion Programme

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
Computers and Accessories	No	4	-	-	4	1.925	7,094	-	-	7,094
Printers	No	4	-	-	4	770	2,838	-	-	2,838
Steel Cabinet	No	4	-	-	4	231	851	-	-	851
Office Sets	No	14	-	-	14	1.155	14,898	-	-	14,898
<b>Subtotal Equipment and Materials</b>							<b>25,682</b>	<b>-</b>	<b>-</b>	<b>25,682</b>

### 3.7 Equipment Hire Costs

3.7.1 Potato Foundation Seed Production	See sheet 3.7.1	1,036
3.7.2 Potato Certified Seed Production	See sheet 3.7.2	13,033
3.7.3 Seed Programme - Debub	See sheet 3.7.3	137,049
3.7.4 Irrigated Crops - Debub	See sheet 3.7.4	404,723
3.7.5 Seed Programme - Gash Barka	See sheet 3.7.5	61,607
		<b>617,447</b>

Euro

3.7.1 Equipment Hire for  
Potato Foundation Seed Production  
EC Contribution to PCRRDP Expansion Programme

**A. NARI Production management**

Land preparation /a

Harvesting /i

Unit	Quantities				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Ha	6	30	-	36	31	151	775	-	925
Ha	1.2	6	-	7.2	18	18	92	-	110
									1,036

\a 5 hours of tractor per Ha each euro 6

\i 3 tractors hours per ha each euro 6.16

3.7.2 Equipment Hire for  
Potato Certified Seed Production  
EC Contribution to PCRRDP Expansion Programme

**A. Debub/ Gash Barka**

Land preparation /a

Harvesting /i

Distribution- truck

Unit	Quantities				Unit Cost (Euro)	EU			
	2009	2010	2011	Total		2009	2010	2011	Total
Ha	6	30	-	36	62	302	1,549	-	1,851
Ha	30	5.04	25.14	60.18	18	450	78	397	925
Ha	30	5.04	25.14	60.18	205	4,987	861	4,409	10,257
									13,033

\a 5 hours of tractor per Ha each euro 12.32

\i 3 tractors per ha each \$ 6.16



**3.7.3 Equipment Hire Costs**  
**Seed Programme - Debub**  
 EC Contribution to PCRRDP Expansion Programme

		Quantities				Unit Cost (Euro)	EU			
Unit		2009	2010	2011	Total		2009	2010	2011	Total
I. Investment Costs										
A. Breeder Seed										
1. Sorghum										
a. Tractor Services	Ha	0.3	0.6	1.5	2.4	148	38	78	199	315
b. Fertilizer										
c. Processing	Ha	0.3	0.6	1.5	2.4	160	41	84	216	340
a. Tractor Services	Ha	0.3	0.6	1.5	2.4	148	38	78	199	315
c. Processing	Ha	0.3	0.6	1.5	2.4	20	5	10	27	43
3. Wheat										
a. Tractor Services	Ha	1.2	1.2	1.2	3.6	148	151	155	160	466
c. Processing	Ha	1.2	1.2	1.2	3.6	153	156	161	165	482
4. Barley										
a. Tractor Services	Ha	1.2	1.2	1.2	3.6	148	151	155	160	466
c. Processing	Ha	1.2	1.2	1.2	3.6	153	156	161	165	482
5. Chick Pea										
a. Tractor Services	Ha	0.9	0.9	0.9	2.7	148	113	116	120	350
b. Processing	Ha	0.9	0.9	0.9	2.7	274	210	216	222	647
6. Lentil/ Faba bean										
a. Tractor Services	Ha	0.9	0.9	0.9	2.7	148	113	116	120	350
b. Processing	Ha	0.9	0.9	0.9	2.7	274	210	216	222	647
B. Foundation Seed										
1. Sorghum										
a. Tractor Services	Ha	1.2	4.5	4.5	10.2	148	151	582	598	1,332
c. Processing	Ha	1.2	4.5	4.5	10.2	160	163	630	647	1,440
a. Tractor Services	Ha	1.2	7.5	7.5	16.2	148	151	971	997	2,119
c. Processing	Ha	1.2	7.5	7.5	16.2	160	163	1,049	1,078	2,291
a. Tractor Services	Ha	1.8	6	6	13.8	148	227	777	798	1,801
c. Processing	Ha	1.8	6	6	13.8	160	245	840	862	1,947
4. Barley										
a. Tractor Services	Ha	1.8	6	6	13.8	148	227	777	798	1,801
5. Chick Pea										
a. Tractor Services	Ha	1.2	6	6	13.2	148	151	777	798	1,726
b. Processing	Ha	1.2	6	6	13.2	160	163	840	862	1,866
6. Lentil/ Faba bean										
a. Tractor Services	Ha	1.2	3.75	3.75	8.7	148	151	485	499	1,135
C. Certified Seed										
1. Sorghum										
a. Tractor Services	Ha	24	31.5	31.5	87	148	3,420	5,585	5,711	14,716
c. Processing	Ha	24	31.5	31.5	87	160	3,698	4,985	5,121	13,803
2. Maize										
a. Tractor Services	Ha	6	24	24	54	148	855	3,513	3,609	7,977
c. Processing	Ha	6	24	24	54	160	924	3,798	3,901	8,624
3. Wheat										
a. Tractor Services	Ha	18	30	30	78	148	2,565	4,392	4,511	11,468
c. Processing	Ha	18	30	30	78	160	2,773	4,748	4,877	12,398
4. Barley										
a. Tractor Services	Ha	18	30	30	78	148	2,565	4,392	4,511	11,468
c. Processing	Ha	18	30	30	78	160	2,773	4,748	4,877	12,398
5. Chick Pea										
a. Tractor Services	Ha	6	21	21	48	148	855	3,074	3,158	7,087
b. Processing	Ha	6	21	21	48	160	924	3,323	3,414	7,662
6. Lentil/ Faba bean										
a. Tractor Services	Ha	6	21	21	48	148	855	3,074	3,158	7,087

137,049

3.7.4 Equipment Hire for  
Irrigated Crops - Debub  
EC Contribution to PCRRDP Expansion Program

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
I. Investment Costs										
A. Irrigated Crops										
1. Tomato										
a. Ploughing/Harrowing	Ha	150	18	33	201	77,15	9,384	1,157	2,178	12,719
b. Fertilizer										
2. Onion										
a. Ploughing/Harrowing	Ha	90	18	33	141	77,15	5,630	1,157	2,178	8,965
3. Cabbage										
a. Ploughing/Harrowing	Ha	120	6	14.4	140.4	77,50	7,541	387	955	8,883
4. Lettuce										
a. Ploughing/Harrowing	Ha	120	6	10.2	136.2	77,50	7,541	387	676	8,605
5. Swiss Chard										
a. Ploughing/Harrowing	Ha	120	6	10.2	136.2	77,50	7,541	387	676	8,605
b. Fertilizer										
6. Pepper										
a. Ploughing/Harrowing	Ha	120	18	27	165	77,50	7,541	1,162	1,790	10,493
B. Spate Irrigation										
1. Maize										
a. Ploughing/Harrowing	Ha	150	600	600	1,350	154,31	18,769	77,118	79,216	175,103
2. Sorghum										
a. Ploughing/Harrowing	Ha	120	600	600	1,320	154,31	15,015	77,118	79,216	171,349
										404,723

**3.7.5 Equipment Hire costs for**  
Seed Programme - Gash Barka  
EC Contribution to PCRRDP Expansion Progra

		Quantities				Unit Cost	EU			
	Unit	2009	2010	2011	Total	(Euro)	2009	2010	2011	Total
I. Investment Costs										
A. Breeder Seed										
1. Sorghum										
a. Tractor Services	Ha	1.2	1.2	1.2	3.6	148	151	155	160	466
c. Processing	Ha	1.2	1.2	1.2	3.6	160	163	168	172	504
2. Maize										
a. Tractor Services	Ha	1.2	1.2	1.2	3.6	148	151	155	160	466
c. Processing	Ls	1.2	1.2	1.2	3.6	160	163	168	172	504
3. Pear Millet										
a. Tractor Services	Ha	1.2	1.2	1.2	3.6	148	151	155	160	466
c. Processing	Ha	1.2	1.2	1.2	3.6	160	163	168	172	504
B. Foundation Seed										
1. Sorghum										
a. Tractor Services	Ha	-	4.5	4.5	9	148	-	582	598	1,181
c. Processing	Ls	-	4.5	4.5	9	160	-	630	647	1,277
2. Maize										
a. Tractor Services	Ha	-	7.5	7.5	15	148	-	971	997	1,968
b. Fertilizer										
c. Processing	Ha	-	7.5	7.5	15	160	-	1,049	1,078	2,128
3. Pearl Millet										
a. Tractor Services	Ha	-	4.5	4.5	9	148	-	582	598	1,181
c. Processing	Ls	-	4.5	4.5	9	160	-	630	647	1,277
a. Tractor Services	Ha	1.2	1.2	1.2	3.6	148	151	155	160	466
5. Common Bean										
a. Tractor Services	Ha	1.2	1.2	1.2	3.6	148	-	-	-	-
C. Certified Seed										
1. Sorghum										
a. Tractor Services	Ha	-	24	24	48	148	-	3,107	3,191	6,298
c. Processing	Ha	-	24	24	48	160	-	3,358	3,450	6,808
2. Maize										
a. Tractor Services	Ha	-	27	27	54	148	-	3,495	3,590	7,085
c. Processing	Ha	-	27	27	54	160	-	3,778	3,881	7,659
3. Pearl Millet										
a. Tractor Services	Ha	-	24	24	48	148	-	3,107	3,191	6,298
c. Processing	Ha	-	24	24	48	160	-	3,358	3,450	6,808
4. Sesame										
a. Tractor Services	Ha	-	18	18	36	148	-	2,330	2,393	4,723
5. Common Bean										
a. Tractor Services	Ha	-	13.5	13.5	27	148	-	1,747	1,795	3,542
										61,607

## 4.1 Operation and Maintenance

Development of Seed System: Institution Strengthening  
EC Contribution to PCRRDP Expansion Programme

	Unit	Quantities				Unit Cost (Euro)	EU			
		2009	2010	2011	Total		2009	2010	2011	Total
Vehicle operation expenses	Ls	2	2	2	6	2.695	4,480	4,602	4,727	13,809

### 5.1 Evaluation costs, including technical support to Procurement/ Financial Management

TA to backstop M/E systems, technical implementation support,  
Procurement, Financial Management/ accounts.

Unit	Quantity	Rate	Total
Semester	6	29,757	178,542

Package #	List of Contracts	Lot Number	Estimated Amount \$	ICB	Limited International Bidding	National Competitive Bidding	Direct Contracting	Community Participation in Procurement
1.1	<b>ALLOWANCES</b>							
	Seed/ planting material committee (90 days)	1	14,434				14,434	
	Supervision costs (5 committee members)	2	7,217				7,217	
1.2	<b>INCENTIVES FOR CASUAL LABOUR (112 Ha)</b>		2,335					2,335
3.1	<b>PURCHASE OF VEHICLES</b>							
	Pick-up truck (1 No)	1	20,812		20,812			
	4WD Vehicles (1 No)	2	43,706		43,706			
	Milk collection van (1 No)	3	83,042		83,042			
3.2	<b>SEEDS (VARIOUS)</b>							
	Horticultural Seeds (679kgs)	1	21,817	21,816.58				
	Field Crops 1,036,843 kgs)	2	380,785	380,784.71				
	Sparte Irrigation (9,730kgs)	3	10,236	10,236.35				
	Grass and Legume Seeds	4	97,487	97,487.36				
3.3	<b>FERTILISERS</b>							
	Urea (390,500 kgs)	1	269,421	269,421				
	DAP (829,250 kgs)	2	692,797	692,797				
3.4	<b>SPRAYS AND FUNGICIDES</b>							
	Herbicides (85,350 litres)	1	148,104	148,104				
	Insecticides/Fungicides (34,330 kgs)	2	525,096	525,096				
	<b>Assorted Animal Health Drugs and Vaccines</b>	3	199,440	199,440				
3.5	<b>ANIMALS/ BIRDS</b>							
	Selection of breeds and other inspections (240 days)	1	3,405					3,405
	Distribution of dairy animals (228 No)	2	278,263					278,263
	Backyard Poultry (Ls)	3	131,206					131,206
3.6	<b>OTHER EQUIPMENT AND MATERIALS</b>							
	Fuel, Lubricants and related	1	124,995				124,995	
	WAN and LAN Assorted Equipment	1	225,934	225,934				
	Crop monitoring and remote sensing	2	34,972	34,972				
	Surface Irrigation Equipments (Water Pumps, pipes/ PVC tubes)	1	34,582			34,582		
	Computers and Accessories (4 No)	1	7,094			7,094		
	Printers (4 No)	2	2,838			2,838		
	Steel Cabinet (4 No)	3	851			851		
	Office Sets (14 No)	4	14,898			14,898		
3.7	<b>EQUIPMENT HIRE COSTS</b>		617,447			617,447		
3.8	<b>VEHICLE OPERATING COSTS (2 Vehicles)</b>		13,809				13,809	
5.1	<b>EVALUATION AND IMPLEMENTATION SUPPORT (6 SEMISTERS)</b>		178,542				178,542	
	<b>Total Direct Costs</b>		4,185,566	2,606,089	147,561	677,711	338,997	415,209
	<b>5% Contingency</b>		206,957					
	<b>7% Overheads</b>		4,392,523					
	<b>Total</b>		4,700,000					

### **APPENDIX 3: ENTERPRISE INPUTS/OUTPUTS COEFFICIENTS AND TARGETS**

Package I: National Programme

Package II: Debub

Package III: Gash Barka



## PACKAGE I: NATIONAL PROGRAMME

### NARI INFRASTRUCTURE DEVELOPMENT FOR SEED PRODUCTION

Table 1: Upgrading Seed Processing Plants at Halhale and Tesenne

S/No	Activities	Inputs	Unit of Measurement	Quantity	Unit Price (USD)	Total Cost (USD)	Comment
1	Extension ladder	3-7 mts	piece	2.00	150.00	300.00	Halhale: 35-37 qtls/hr
2	Industrial cable reel	25 mt	piece	2.00	176.00	352.00	Tessenei: 50 qtls/hr
3	Cordless screw driver	3.5 lbs	kit	2.00	104.00	208.00	
4	Socket and tool kits		kit	2.00	300.00	600.00	
5	Air operated grease gun		piece	2.00	37.00	74.00	
6	Lever action transfer pump		piece	2.00	70.00	140.00	
7	Padded overalls medium size		piece	10.00	28.00	280.00	
8	Safety footwear	Size 6.5-9	pairs	10.00	75.00	750.00	
9	Electricians tool case		piece	1.00	20.00	20.00	
10	Fuel pump perkins	Type T4-236	piece	1.00	1,783.00	1,783.00	
11	Portable bag closer	model.ECR	piece	2.00	1,395.00	2,790.00	
12	Grain bags	50kg	piece	100,000.00	0.07	7,000.00	
13	Belt conveyer for loading	X903-22-101056	piece	1.00	3,768.00	3,768.00	
14	Air compressor cyclone	KD-53-10-300	piece	2.00	150.00	300.00	
15	Thread	20/4 polyester	cone	5,000.00	13.33	66,500.00	
16	Chemicals (Apron star of Thiram or Carboxin/Thiram) water dispensible		litres	500.00	30.00	15,000.00	Choose the one that is best
17	Overseas training of technician in seed dressing		No	1.00	6,000.00	6,000.00	One month training
18	Training of operators locally		No	5.00	1,000.00	5,000.00	One month training
	Trainees per diem		No	2.00	200.00	400.00	
	Trainers per diem		No	1.00	300.00	300.00	
	<b>Total</b>					<b>111,565.00</b>	



**Table 2: Tissue Culture Support - Laboratory Equipment and Green House Development**

Item	Unit	Amount	Unit Price (USD)	Total Cost (USD)
<b>A. Laboratory Support</b>				
1. Chemicals (assorted)				15,527
2. Membrane pressure tank for water 75lt	No	1	800	800
3. Storage tank (polythylene, 500lt capacity, with built in level control to activate reverse osmosis system and security system against overflow)	pcs	1	6,000	6,000
4. Booster pump (1.5 hp constant pressure) with accessories to fit into a water treatment system	pcs	1	2,000	2,000
5. Pure water distribution blocks (SG Art No. 1703-2)	pcs	5	500	2,500
6. Deionizers SG 6200	pcs	2	2,000	4,000
7. Racks for culture test tubes (inoxidizable metal racks)	pcs	30	14	420
8. Glass bead sterilizer	pcs	3	450	1,350
9. Lamp holdes (double) with electronic balances	pcs	70	80	5,600
10. Grolux cook white fluorescent lamps (40w)	pcs	200	20	4,000
11. LifeGuard vented vessels (for microtuberaizatiion)	pcs	2,000	5	10,000
12. Trolleys	pcs	2	1,000	2,000
13. Timer switches	pcs	30	120	3,600
14. Automatic media dispenser (peristaltic pump action with capacity 0.5 - 10 ltrs)	pcs	1	2,500	2,500
15. Bottle to dispenser (capacity 1-50 ml)	pcs	3	500	1,500
16. ELISA Plate reader	pcs	1	4,000	4,000
17. Sample homogenizer	pcs	1	3,000	3,000
18. Incubator with orbital shaker with accessories	pcs	1	6,500	6,500
19. Orbital shaker	pcs	2	1,800	3,600
20. Digital stereo microscope with built in 1/3" CCD camera 3MP with a separate cook white light source	pcs	2	1,000	2,000
21. Gel Electrophoresis system (horizontal) with accessories and reagents	pcs	1	1,000	1,000
<b>Subtotal</b>				<b>81,897</b>
<b>B. Greenhouse</b>				
1. Greenhouse (aluminium framae, polycarbonate walls, equiped with cooling fans, irrigation system, temperature and humidity control and benches)	m <sup>2</sup>	300	300	90,000
2. Technical assistance	PM	2	15,000	30,000
3. Stationary benches (90 cm ht, 1.5m x 3m) metal	pcs	100	250	25,000
4. Plastic pots 30 cm	pcs	1,000	10	10,000
5. Transplant trays	pcs	1,000	10	10,000
6. Plastic boxes for greenhouse planting	pcs	1,000	10	10,000
7. ULV sprayers	pcs	2	200	400
8. Gardening implements	LS	1	1,000	1,000
9. Sacks	pcs	1	1,000	1,000
10. Fertilizers and nutrient solutions	LS	1	2,000	2,000
<b>Subtotal</b>				<b>179,400</b>
<b>Total</b>				<b>261,297</b>

**Table 3: Potato - Pre-basic and Basic seed Production (Laboratory/Greenhouse)**

S/No	Activities	Inputs	Unit of Measurement	Quantity	Unit Price (USD)	Total Cost (USD)	Comment
1	Media preparation	chemicals	LS	1.0	2,587.80	2,587.80	2 seasons of 4 months each per year
2	In vitro plant establishment	water	Barrels	2,550.0	0.07	178.50	
3	Thermotherapy and meristem culture					-	
4	Micro-propagation of nuclear stock material (FO)					-	
5	Greenhouse production of minitubers (pre-basic material - FI) and basic material	plotting compos	Quintal	10.0	100.00	1,000.00	peat moss, sphagnum moss
6	Transplanting, weeding, irrigation, rogueing, pesticide application, harvesting, cleaning and grading	labour	MD	720.0	3.33	2,397.60	
7	Plant protection	insecticides	litres	1.0	35.00	35.00	Dimethoate/cholorpyri phos/ viancozeb or redomil
		fungicides	kg	1.0	35.00	35.00	
8	Running laboratory activities	staff	man-month	36.0	100.00	3,600.00	Govt contribution
9	Fuel for standby generator	fuel	litres	300.0	1.07	321.00	
10	Maintenance	labour	LS	1.0	2,000.00	2,000.00	
	<b>Total</b>					<b>12,154.9</b>	

Table 4: Support for Potato Foundation Seed Production

Activities/Item	Unit of Measurement	Quantity	Unit Price (USD)	Total Cost (USD)	Comment
<b>Civil Works (NARI)</b>					
Store (DLS) 200tn capacity	sqm	500	200.00	100,000.00	
Working area/sorting and packaging shed	m <sup>2</sup>	100	66.70	6,670.00	
Establishment of farm tool shed	m <sup>2</sup>	20	200.00	4,000.00	
Well	No	1	5,000.00	5,000.00	
Water pump	No	1	4,000.00	4,000.00	
Pipes	No	100	200.00	20,000.00	
<b>Civil Works (Zoba)</b>					
Establishment of store (DLS) 300tn capacity	sqm	480	200.00	96,000.00	
Working area/sorting and packaging shed	m <sup>2</sup>	200	66.70	13,340.00	
Tool shed	m <sup>2</sup>	40	200.00	8,000.00	
<b>Subtotal - Civil works</b>				<b>257,010.00</b>	
<b>Equipment</b>					
Potato planter	No	1	13,333.33	13,333.33	
Potato digger	No	1	13,333.33	13,333.33	
Grader and packing unit	No	1	26,666.67	26,666.67	
Pesticide sprayers motorized	No	5	666.67	3,333.35	
Pesticide sprayers knapsack	No	10	53.30	533.00	5 for NARIS, 5 for Zoba
Pickup truck	No	1	33,333.33	33,333.33	
Tractor	No	1	23,333.33	23,333.33	
Disc harrow	No	1	8,000.00	8,000.00	
Disc plough	No	1	7,333.33	7,333.33	
Ridger	No	1	6,666.67	6,666.67	
Leveler	No	1	4,000.00	4,000.00	
<b>Subtotal - Equipment</b>				<b>139,866.35</b>	
<b>Capacity Building</b>					
Training on field inspection and diseases identification	man days	5	250.00	1,250.00	
Trainer (local consultant)					
Per diem for trainees (20)	man days	100	50.00	5,000.00	
Training materials	LS	1	1,000.00	1,000.00	
Overseas training on seed potato production systems 2 staff for M.Sc. Course	person year	3	15,000.00	45,000.00	
<b>Subtotal - Capacity Building</b>				<b>52,250.00</b>	
<b>Total</b>				<b>449,126.35</b>	

## POTATO SEED PRODUCTION

Table 5: NARI - Potato Seed Production: NARI sourced materials

Item	Unit of measure	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Total
Foundation Seed Area	ha	2.0	10.0	-	-	-	-	12.0
Foundation seed production	ton	-	25.0	125.0	-	-	-	150.0
Seed available to farmers for certified seed at 67% outturn	ton	-	16.8	83.8	-	-	-	100.6
Area of certified seed by farmers	ha	-	8.4	41.9	-	-	-	50.3
Production of certified seed	ton	-	-	105.0	523.8	-	-	628.8
Available certified seed for production at 67% outturn	ton	-	-	70.4	350.4	-	-	420.8
Commercial potato production by farmers	ha	-	-	35.2	175.2	-	-	210.4
Commercial potato production at 10 tons/ha (1st generation)	ton	-	-	352.0	1,752.0	-	-	2,104.0

ERITREA: Post-Crisis Rural Recovery and Development Programme (PCRRDP) – Add-on Programme  
Final Design Report

**Table 6: Potato Seed Production/NARI and Imported Sources**

Item	Unit of measure	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>		Total
Imported Foundation Seed	ton	100.0	-	-	-	-	-	100.0
NARI sourced Foundation seed	ton	-	16.8	83.8	-	-	-	100.6
Total available foundation seed	ton	100.0	16.8	83.8	-	-	-	200.6
Area of certified seed by farmers	ha	50.0	8.4	41.9	-	-	-	100.3
Certified seed production @ 12.5 tons/ha	ton	-	625.0	105.0	523.7	-	-	1,253.7
Certified seed available for commercial planting @ 67% out-turn	ton	-	418.8	70.4	350.9	-	-	840.1
Area of commercial potato production from certified seeds first generation	ha	-	209.4	35.2	175.5	-	-	420.1
Area of commercial potato production (2nd generation)	ha	-	-	209.4	35.2	175.5	-	420.1
Area of commercial potato production (3rd generation)	ha	-	-	-	209.4	35.2	175.5	420.1
<b>Total</b>	<b>ha</b>	<b>250.0</b>	<b>1,295.2</b>	<b>629.5</b>	<b>1,294.7</b>	<b>210.7</b>	<b>175.5</b>	<b>3,855.6</b>

**Table 7: Potato Seed Production Targets**

Item	Unit of measure	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Total
Foundation seed	ha	2.0	10.0	-	-	-	-	12.0
Certified seed	ha	50.0	8.4	41.9	-	-	-	100.3
<b>Total</b>		<b>52.0</b>	<b>18.4</b>	<b>41.9</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>112.3</b>

**Table 8: Potato Foundation Seed Production Input-Output/ha (NARI)**

S/No	Activities/Item	Inputs	Unit of Measurement	Quantity	Unit Price (USD)	Total Cost (USD)	Comment
1	Land preparation (ploughing, discs, ridger)	Tractor <sup>21</sup>	hr	5	8.00	40.00	2 seasons of 4 months/yr out-turn is 67%
2	Planting	Seed <sup>21</sup>	ton	2		0.00	
3	Irrigation	Fuel	litres	50	1.10	55.00	12.5 ton/ha/season
		Lubricant	litres	2	3.30	6.60	
4	Fertilization	Urea	kg	300	0.70	210.00	
		DAP	kg	200	0.83	166.00	
5	Rogueing (trained labour)	Labour	MD	10	6.70	67.00	
		Bags	pieces	20	1.33	26.60	
6	Plant protection insecticide (Dimethoate or chlorpyrifos) Fungicide (Redomil or Mancozeb) Sprayers (Motorised) Fuel Yellow traps	Tags	pieces	500	0.10	50.00	
			litres	2	23.30	46.60	
			kg	2	16.70	33.40	
			litres	3	1.10	3.30	
			pieces	25	8.00	200.00	
7	Harvesting	Tractor <sup>21</sup>	hr	3	8.00	24.00	
8	Storage (the tubers have to be reshuffled periodically in the store. Constant inspection and removal of tubers with symptoms will also)	Insecticide	litres	0.5	23.30	11.65	
		Fungicide	kg	0.5	16.70	8.35	
		Labour	MD	180	3.30	594.00	Dimethoate/chlorpyrifos/
9	Distribution	Sacks	No	1000	1.00	1000.00	Mancozeb or redomil
		Truck	No	2	133.30	266.60	
10	Cultural practices (planting, weeding, irrigation, application of agro-chemicals, etc)	Labour	MD	96	3.30	316.80	
		Implements	pieces	5	6.70	33.50	hoes/shovels
	<b>Sub-total</b>					<b>3119.40</b>	
	<b>Supervision</b>					<b>0.00</b>	
	Monitoring	transportation <sup>21</sup>	days	10	50.00	500.00	
		per diem	MD	10	30.00	300.00	
	<b>Sub-total - Supervision</b>					<b>800.00</b>	
	<b>Total</b>					<b>3919.40</b>	

<sup>21</sup> Running cost of tractor provided under equipment

<sup>22</sup> Breeder seed produced by NARI; costs accounted for under laboratory/green house operation

<sup>23</sup> Fueling of vehicle already provided under the project

ERITREA: Post-Crisis Rural Recovery and Development Programme (PCRRDP) – Add-on Programme  
Final Design Report

Table 9: Potato Certified Seed Production Input-Output/ha

S/No	Activities/Item	Inputs	Unit of Measurement	Quantity	Unit Price (USD)	Total Cost (USD)	Comment
1	Land preparation (ploughing, discs, ridger)	Tractor	hr	5	16.00	80.00	2 seasons of 4 months/yr out-turn is 67%
2	Planting	Seed <sup>1)</sup>	ton	2	1,333.33	2,666.67	12.5 ton/ha/season
3	Irrigation	Fuel	litres	300	1.07	320.00	
		Lubricant	litres	10	3.30	33.00	
4	Fertilization	Urea	kg	3	0.70	2.10	
		DAP	kg	2	0.83	1.66	
5	Rogueing (trained labour) <sup>2)</sup>	Labour <sup>2)</sup>	MD	10	6.70	67.00	
		Bags	pieces	20	1.33	26.60	
		Tags	pieces	2000	0.10	200.00	
6	Plant protection insecticide (Dimethoate or chlorpyrifos) Fungicide (Redomil or Mancozeb) Sprayers (Motorised) Fuel Yellow traps		litres	2	23.30	46.60	
			kg	2	16.70	33.40	
			pieces	2	-	-	
			litres	100	1.10	110.00	
			pieces	50	8.00	400.00	
7	Harvesting	Tractor	hr	3	8.00	24.00	
8	Storage (the tubers have to be reshuffled periodically in the store. Constant inspection and removal of tubers with symptoms will also	Insecticide	litres	2	23.30	46.60	
		Fungicide	kg	2	16.70	33.40	
		Labour	MD	180	3.30	594.00	Dimethoate/chlorpyrifos/vlancozebe or redomil
9	Distribution	Sacks	No	1000	1.00	1,000.00	
		Truck	No	2	133.30	266.60	
10	Cultural practices (planting, weeding, irrigation, application of agro-chemicals, etc)	Labour <sup>2)</sup>	MD	960	3.30	3,168.00	
		Implements <sup>2)</sup>	pieces	30	6.70	201.00	hoes/shovels
	<b>Sub-total</b>					<b>9,320.63</b>	

<sup>1)</sup> Seed will be procured (imported) only in PY1; for subsequent years, seed will be sourced from project production, no additional cost is required.

<sup>2)</sup> Farmers will directly bear these costs. Project costing can exclude them. Therefore per ha cost for PY1 = \$5,963; PY2 & PY3 = \$3,296 respectively.

**Table 10: Breeder Seed - Programme Target**  
**Fast Track Introduced advanced and fixed Lines\***

Crops	Inputs		Unit of measure	Qty of Input/ ha	Target Areas							Input Unit Price
					Project Year							
					1	2	3	4	5	6	Total	
Sorghum	Ploughing/harrowing/		hr	10.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	16.00
	2. Fertilizer										0	
	Urea		kg	50.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.67
	DAP		kg	100.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.83
	3. Labour; Planting, weeding, rigueing, bird		person day	220.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	3.30
	Threshing, packing,		LS	1.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	208.00
Maize	Ploughing/harrowing/		hr	12.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	16.00
	2. Fertilizer											
	Urea		kg	50.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.67
	DAP		kg	100.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.83
	3. Labour; Planting, weeding, rigueing, bird		person day	170.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	3.30
	4. Processing		LS	1.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	208.00
Pearl Millet	Ploughing/harrowing/		hr	12.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	16.00
	2. Fertilizer											
	Urea		kg	50.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.67
	DAP		kg	100.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.83
	3. Labour; Planting, weeding, rigueing, bird		person day	220.00	0.1	0.1	0.1	0.1	0.1	0.1	0.6	3.30
	4. Processing		LS	1	0.1	0.1	0.1	0.1	0.1	0.1	6	301.00
Sesame	Ploughing/harrowing/		hr	12.00	0.01	0.01	0.01	0.01	0.01	0.01	0.06	16.00
	Others		LS	1.00	0.01	0.01	0.01	0.01	0.01	0.01	0.06	25
	Seeds		Ks	20	0.01	0.01	0.01	0.01	0.01	0.01	0.06	1.20
Barley	Ploughing/harrowing/		hr	12.00	1	1	1	1	1	1	6	16.00
	2. Fertilizer											
	Urea		kg	50.00	1	1	1	1	1	1	6	0.67
	DAP		kg	100.00	1	1	1	1	1	1	6	0.83
	3. Labour; Planting, weeding, rigueing, bird		person day	148.00	1	1	1	1	1	1	6	3.30
	4. Processing		LS	1	1	1	1	1	1	1	6	301.00
Wheat	Ploughing/harrowing/		hr	12.00	1	1	1	1	1	1	6	16.00
	2. Fertilizer											
	Urea		kg	50.00	1	1	1	1	1	1	6	0.67
	DAP		kg	100.00	1	1	1	1	1	1	6	0.83
	3. Labour; Planting, weeding, rigueing, bird		person day	148.00	1	1	1	1	1	1	6	3.30
	4. Processing		LS	1	1	1	1	1	1	1	6	301.00
Chick Pea	Ploughing/harrowing/		hr	12.00	2	2	2	2	2	2	12	16.00
	2. Fertilizer											
	Urea		kg	50.00	2	2	2	2	2	2	12	0.67
	DAP		kg	100.00	2	2	2	2	2	2	12	0.83
	3. Labour; Planting, weeding, rigueing, bird		person day	147.00	2	2	2	2	2	2	12	3.30
	4. Processing		LS	1	2	2	2	2	2	2	12	301.00
Lentil	Ploughing/harrowing/		hr	12.00	0.5	0.5	0.5	0.5	0.5	0.5	3	16.00
	2. Fertilizer											
	Urea		kg	50.00	0.5	0.5	0.5	0.5	0.5	0.5	3	0.67
	DAP		kg	100.00	0.5	0.5	0.5	0.5	0.5	0.5	3	0.83
	3. Labour; Planting, weeding, rigueing, bird		person day	149.00	0.5	0.5	0.5	0.5	0.5	0.5	3	3.30
	4. Processing		LS	1	0.5	0.5	0.5	0.5	0.5	0.5	3	301.00
Tomato and Onion				-	-	-	-	-	-	-	-	-

\* These are advanced and fixed lines tested and/ or released in countries with similar agro-climatic conditions e.g. Sudan, Kenya, India, etc. Through Cooperation with CGIAR centres such as ICARDA and CYMIT (wheat, barley, chick pea, lentil, Faba bean, and Maize) and ICRISAT (Sorghum and Pearl Millet). For Tomato and onion, local population will be included in the Programme.

ERITREA: Post-Crisis Rural Recovery and Development Programme (PCRRDP) – Add-on Programme  
Final Design Report

**Table 11: Foundation Seed- Programme Target, Inputs, Unit Input Price**

Crops	Inputs	Unit of measure	Qty of Input/ ha	Target Areas			Input Unit Price
				Project Year			
				1	2	Total	
Sorghum	Ploughing/harrowing/	hr	10.00		10	10	16.00
	2. Fertilizer					0	
	Urea	kg	50.00		10	10	0.67
	DAP	kg	100.00		10	10	0.83
	3. Labour; Planting, weeding, rigueing, bird	person day	220.00		10	10	3.30
	Threshing, packing,	LS	1.00		10	10	208.00
Maize	Ploughing/harrowing/	hr	12.00		10	10	16.00
	2. Fertilizer						
	Urea	kg	50.00		10	10	0.67
	DAP	kg	100.00		10	10	0.83
	3. Labour; Planting, weeding, rigueing, bird	person day	170.00		10	10	3.30
	4. Processing	LS	1.00		10	10	208.00
Pearl Millet	Ploughing/harrowing/	hr	12.00		5	5	16.00
	2. Fertilizer						
	Urea	kg	50.00		5	5	0.67
	DAP	kg	100.00		5	5	0.83
	3. Labour; Planting, weeding, rigueing, bird	person day	220.00		5	5	3.30
	4. Processing	LS	1		5	6	301.00
Sesame	Ploughing/harrowing/	hr	12.00		1.3	1.3	16.00
	Others	Ls	1.00		1.3	1.3	25
	Seeds	Kg	20.00		1.3	1.3	1.20
Barley	Ploughing/harrowing/	hr	12.00		27	27	16.00
	2. Fertilizer						
	Urea	kg	50.00	27	27	54	0.67
	DAP	kg	100.00	27	27	54	0.83
	3. Labour; Planting, weeding, rigueing, bird	person day	148.00	27	27	54	3.30
	4. Processing	LS	1	27	27	54	301.00
Wheat	Ploughing/harrowing/	hr	12.00	27	27	54	16.00
	2. Fertilizer						
	Urea	kg	50.00	27	27	54	0.67
	DAP	kg	100.00	27	27	54	0.83
	3. Labour; Planting, weeding, rigueing, bird	person day	148.00	27	27	54	3.30
	4. Processing	LS	1	27	27	54	301.00
Chick Pea	Ploughing/harrowing/	hr	12.00		16	16	16.00
	2. Fertilizer						
	Urea	kg	50.00		16	16	0.67
	DAP	kg	100.00		16	16	0.83
	3. Labour; Planting, weeding, rigueing, bird	person day	147.00		16	16	3.30
	4. Processing	LS	1		16	16	301.00
Lentil	Ploughing/harrowing/	hr	12.00		5	5	16.00
	2. Fertilizer						
	Urea	kg	50.00		5	5	0.67
	DAP	kg	100.00		5	5	0.83
	3. Labour; Planting, weeding, rigueing, bird	person day	149.00		5	5	3.30
	4. Processing	LS	1		5	5	301.00
Tomato and Onion			-	-	-	-	-

**Table 13: Certified Seed Programme Targets**

Crops	Inputs		Unit of measure	Qty of Input/ ha	Target Areas		Input Unit Price
					Project Year		
					1	Total	
Sorghum	Ploughing/harrowing/ ridging		hr	12.00	750	750	16.00
	2. Fertilizer						
		Urea	kg	50.00	750	750	0.67
		DAP	kg	100.00	750	750	0.83
	3. Labour; Planting, weeding, packing, storage, transport		person day	126.00	750	750	3.30
			lump sum	1.00	750	750	208.00
Maize	Ploughing/harrowing/ ridging		hr	12.00	216	216	16.00
	2. Fertilizer						
		Urea	kg	50.00	216	216	0.67
		DAP	kg	100.00	216	216	0.83
	3. Labour; Planting, weeding,		person day	152.00	216	216	3.30
	4. Processing		lump sum	1.00	216	216	208.00
Wheat	Ploughing/harrowing/ ridging		hr	12.00	300	300	16.00
	2. Fertilizer					-	
		Urea	kg	50.00	300	300	0.67
		DAP	kg	100.00	300	300	0.83
	3. Labour; Planting, weeding,		person day	120.00	300	300	3.30
	4. Processing		LS	1	300	300	208.00
Barley	Ploughing/harrowing/ ridging		hr	12.00	300	300	16.00
	2. Fertilizer				300	-	
		Urea	kg	50.00	300	300	0.67
		DAP	kg	100.00	300	300	0.83
	3. Labour; Planting, weeding,		person day	175.00	300	300	3.30
	4. Processing		lump sum	1	300	300	208.00
Chick Pea	Ploughing/harrowing/ ridging		hr	12.00	45	45	16.00
	2. Fertilizer						
		Urea	kg	-	45	45	0.67
		DAP	kg	-	45	45	0.83
	3. Labour; Planting, weeding,		person day	148.00	45	45	3.30
	4. Processing		lump sum	1	45	45	208.00
Tomato	Ploughing/harrowing/ ridging		hr	12.00	160	160	16.00
	2. Fertilizer					-	
		Urea	kg	50.00	160	160	0.67
		DAP	kg	100.00	160	160	0.83
	3. Labour; Planting, weeding,		person day	148.00	160	160	3.30
	4. Processing		lump sum			-	208.00
Onion	Ploughing/harrowing/ ridging		hr	12.00	40	40	16.00
	2. Fertilizer					-	
		Urea	kg	50.00	40	40	0.67
		DAP	kg	100.00	40	40	0.83
	3. Labour; Planting, weeding,		person day	148.00	40	40	3.30
	4. Processing		lump sum			-	208.00
Pearl Millet	Ploughing/harrowing/ ridging		hr	12.00	250	250	16.00
	2. Fertilizer					-	
		Urea	kg	50.00	250	250	0.67
		DAP	kg	100.00	250	250	0.83
	3. Labour; Planting, weeding,		person day	148.00	250	250	3.30
	4. Processing		lump sum			-	208.00

## CAPACITY BUILDING

Table 13: Capacity Building for Seed Production and Distribution

Item of Expenditure	Unit of measure	Unit Price (US\$)	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>
<b>Staffing</b>								
Forage/grass seed production expert (local) <sup>1)</sup>	PY	6,000	3	3	3	3	3	3
Horticulture seed expert <sup>1)</sup>	PY	6,000	3	3	3	3	3	3
Grains/pulses seed expert <sup>1)</sup>	PY	6,000	3	3	3	3	3	3
Quality certification officer	PY	6,000	1	1	1	1	1	1
Seed Supply Data Management Officer <sup>1)</sup>	PY	2,400	3	3	3	3	3	3
<b>Vehicles</b>								
4WD	No	35,000	2	-	-	-	-	-
<b>Equipment and Materials</b>								
Computer and Accessories (desktop)	No	2,500	4	-	-	-	-	-
Printers	No	1,000	4	-	-	-	-	-
Steel cabinet	No	300	4	-	-	-	-	-
Office sets	No	1,500	14	-	-	-	-	-
<b>Training (formal)</b>								
Post graduate (Msc in grains seed production) <sup>2)</sup>	PM	1,200	-	18	-	-	-	-
Post graduate (Msc in horticulture seed production) <sup>2)</sup>	PM	1,200	-	18	-	-	-	-
Short term courses <sup>3)</sup>	PM	1,500	6	6	6	-	-	-
Others - local training/workshops	LS	5,000	1	1	1	-	-	-
<b>Monitoring/Supervision</b>								
Seed/Planting material committee	PD	200	30	30	30	30	30	30
Vehicle operation expenses <sup>4)</sup>	LS	3,500	2	2	2	2	2	2
Supervision cost (5 committee members)	LS	3,000	1	1	1	1	1	1

<sup>1)</sup> One national expert, one expert each for Zoba Debub and Zoba Gash Barka

<sup>2)</sup> Training will preferably be done in a regional institution e.g. Kenya, South Africa

<sup>3)</sup> 3 month short courses for officers with M.Sc. Or above

<sup>4)</sup> Vehicle running cost and per diem for 5 committee members

Table 14: Capacity Building - ICT

En:  
PC  
Tal  
De  
(U:

I.

		Quantity			Cost	
	Unit	2009	Total	Unit Cost	2009	Total
1. Establishment of WAN and LAN						
Set up of the basic infrastructure (HQ, NARI & Zobas)					74 000	74 000
Internet and e-mail connectivity	Set Quintal				25 000	25 000
Dell Power Edge 6850 Server Computers with accessories	Computers	14	14	6.000	84 000	84 000
Dell Power Edge Powerful Computers with accessories	Computers	84	84	2.000	168 000	168 000
Web-Site Server	Server	1	1	25.000	25 000	25 000
Capacity Building	Ls				26 000	26 000
					402 000	402 000
Subtotal Establishment of WAN and LAN						
2. Crop monitoring and remote sensing						
Geo-explorer III Trimble with accessories	Set	1	1	3.600	3 600	3 600
One Work Station of type Dell Dimension 9300	Ls				4 960	4 960
One Smart UPS 1000	Ls				875	875
Software Quotations	Ls				34 252	34 252
Digitizer III CALCOMP 48x60 A 0	Ls				5 108	5 108
Acquisition of Satellite Imagery	Ls				8 000	8 000
Capacity building (training)	Ls				27 133	27 133
Mapping of livelihood system in Zobas	Ls				12 667	12 667
Printer accessories	Ls				1 405	1 405
					98 000	98 000
Subtotal Crop monitoring and remote sensing						
					500 000	500 000
Total						



## PACKAGE II: DEBUB PROGRAMME

### IRRIGATION PROGRAMME

**Table 15: Development Programme/Schedule (Irrigation - Debub)**

Sub-Component/Activities	Unit of measure	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Total	Comments
1. Development Schedule									
A. Pressurised Irrigation	ha	-	110.0	50.0	-	-	-	160.0	Design in PY1
B. Spate Irrigation	ha	-	500.0	1,484.0	-	-	-	1,984.0	Design/Headwork construction in PY1
2. Development Programme									
A. Pressurised Irrigation									
Scheme Design	ha	160.0	-	-	-	-	-	160.0	Govt Services (Force Account)
Advertisement/contract award	ha	2.0	-	-	-	-	-	2.0	National Competitive Bidding
Construction	ha	-	110.0	50.0	-	-	-	160.0	Local contracting
Supervision of construction/ certification of work	ha	-	110.0	50.0	-	-	-	160.0	Govt Services (Force Account)
Scheme Operation	ha	-	110.0	160.0	160.0	160.0	160.0	750.0	Farmers/Govt
B. Spate Irrigation									
Scheme Design	ha	1,984.0	-	-	-	-	-	1,984.0	Govt Services (Force Account)
Headworks construct, etc	ha	1,984.0	-	-	-	-	-	1,984.0	Govt Services (Force Account)
Command Area Development	ha	-	500.0	1,484.0	-	-	-	1,984.0	Govt Services (Force Account)
Scheme Operation	ha	-	500.0	1,984.0	1,984.0	1,984.0	1,984.0	8,436.0	Farmers/Govt

**Table 16: Irrigation Development Investment: Inputs**

Sub-Component/Activities		Inputs	Unit of measure	Qty of inputs/ ha	Area (ha)							Unit cost/ha
					PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Total	
<b>A. Pressurised Irrigation</b>												
	Survey/Design <sup>1</sup>	Staff-time/ labour	staff day/ person day	15.0	160.0	-	-	-	-	-	160.0	150.0
	Construction including installatin of pressurised irrigation pipes, pumps and accessories	Contract	lump sum	1.0	-	110.0	50.0	-	-	-	160.0	7,333.0
	Supervision of construction/ certification <sup>2</sup>	Staff-time/ labour	person day	17.0	-	110.0	50.0	-	-	-	160.0	170.0
<b>B. Spate Irrigation</b>												
	Survey/Design <sup>3</sup>	Staff-time/ labour	staff day/ person day	15.0	1,984.0	-	-	-	-	-	1,984.0	150.0
	Construction including headworks, farm embarkments, farm outlet structures	Contract	lump sum	1.0	1,984.0	-	-	-	-	-	1,984.0	667.0
		Stone collection <sup>4</sup>	person day	32.0	1,984.0	-	-	-	-	-	1,984.0	106.0
	Land-levelling	Contract	lump sum	1.0	-	500.0	1,484.0	-	-	-	1,984.0	131.0
	Supervision of construction/ work certification <sup>5</sup>	Staff-time/ labour	person day	1.6	-	500.0	1,484.0	-	-	-	1,984.0	16.0

1 Govt/Beneficiary contribution

2 Govt contribution

3 Govt/Beneficiary contribution (10% beneficiary cost)

4 Beneficiary contribution

5 Govt contribution

**Table 17: Input Requirement/ha - Irrigated crops: Dehub**

Inputs	Unit of measure	Unit Price	Quantity of Inputs								Onion
			Sorghum	Maize	Tomato	Potato	Pepper	Cabbage	Lettuce	Swiss chard	
Ploughing/harrowing	Tractor hr	16.7	12.0	12.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Fertilizer											
Urea	kg	0.8	92.9	92.9	200.0	200.0	200.0	200.0	200.0	200.0	100.0
DAP	kg	0.7	46.5	46.5	100.0	100.0	100.0	100.0	100.0	100.0	200.0
Potash	kg	0.2	-	-	-	-	-	-	-	-	150.0
Herbicides											-
Attrazine	ltr	33.3	0.47	0.47	-	-	-	-	-	-	-
2-4D	ltr	16.7	0.47	0.47	-	-	-	-	-	-	-
Insecticides											-
Fungicides (mancozeb)	kg	33.3	0.93	0.93	-	-	-	-	-	-	2.0
Thiram	kg	33.3	0.19	0.19	-	-	-	-	-	-	
Maneb	kg	16.5	-	-	-	-	-	-	-	-	2.0
Seed	kg	433.3	-	-	0.5						
Herbicides											
Dimethoate	ltr	23.3	-	-	2.0	2.0	2.0	3.0	3.0	3.0	
Drusban	ltr	23.3	-	-	1.0	1.0	1.0	3.0	2.0	2.0	
Fungicides											
Mancozet	kg	16.7	-	-	1.0	2.0	1.0	1.0	1.0	1.0	
Maneb	kg	16.7	-	-	1.0	2.0	1.0	1.0	1.0	1.0	
Spraying (diesel)	ltr	1.1	-	-	208.0	208.0	208.0	208.0	208.0	208.0	
Seed - pepper	kg	400.0	-	-	-	-	1.0	-	-	-	
Seed cabbage	kg	366.7	-	-	-	-	-	1.0	-	-	
Lettuce seed	kg	366.7	-	-	-	-	-	-	1.0		
Swiss chard	kg	366.7	-	-	-	-	-	-	-	7.0	
Seed (Onion)	kg	46.7	-	-	-	-	-	-	-	-	5.0
Insecticides											
Dimethoate	ltr	23.3	-	-	-	-	-	-	-	-	2.0
Drusban	ltr	23.3	-	-	-	-	-	-	-	-	2.0

**Table 18: Irrigated Crops Targets - ha**

<b>Crops</b>	<b>PY1<sup>1]</sup></b>	<b>PY2<sup>2]</sup></b>	<b>PY3<sup>2]</sup></b>	<b>PY4</b>	<b>PY5</b>	<b>PY6</b>	<b>Total</b>
Tomato	250	30	55	-	-	-	335
Onion	150	30	55	-	-	-	235
Cabbage	200	10	24	-	-	-	234
Lettuce	200	10	17	-	-	-	227
Swiss Chard	200	10	17	-	-	-	227
Pepper	200	30	45	-	-	-	275
<b>Total</b>	<b>1,200</b>	<b>120</b>	<b>213</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,533</b>

<sup>1]</sup> Support to existing schemes

<sup>2]</sup> Expansion of smallscale irrigation development

**Table 19: Spate Irrigated Target - ha**

<b>Crops</b>	<b>PY1<sup>1]</sup></b>	<b>PY2<sup>2]</sup></b>	<b>PY3</b>	<b>PY4</b>	<b>PY5</b>	<b>PY6</b>	<b>Total</b>
Maize	250	1,000	1,000	-	-	-	2,250
Sorghum	200	1,000	1,000	-	-	-	2,200
<b>Total</b>	<b>450</b>	<b>2,000</b>	<b>2,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4,450</b>

<sup>1]</sup> Production Support to existing schemes

<sup>2]</sup> Production Support on new schemes

**Table 20: Pressurised Irrigation: Inputs Requirement/ha and unit prices**

Crops	Inputs	Unit of measure	Qty of Input/ ha	Unit Price (US\$)
<b>Presurried Irrigation</b>				
<b>Tomato</b>	Ploughing/harrowing	Hr	6.00	16.70
	Fertilizer			
	Urea	kg	200.00	0.83
	DAP	kg	100.00	0.67
	Herbicides			
	Attrazine	ltr	-	33.30
	2-4D	ltr	-	16.70
	Insecticides			
	Fungicides	kg	-	33.30
	Thiram	kg	-	33.30
	Seed	kg	0.25	62.30
	Herbicides			
	Dimethoate	ltr	2.00	23.30
	Drusban	ltr	1.00	23.30
	Fungicides			
	Mancozet	kg	1.00	16.70
	Maneb	kg	1.00	16.70
	Spraying (diesel)	ltr	208.00	1.06
<b>Potato</b>	Ploughing/harrowing	Hr	6.00	16.70
	Fertilizer			
	Urea	kg	200.00	0.83
	DAP	kg	100.00	0.67
	Herbicides			
	Attrazine	ltr	-	33.30
	2-4D	ltr	-	16.70
	Insecticides			
	Fungicides	kg	-	33.30
	Thiram	kg	-	33.30
	Seed	kg	2,000.00	0.72
	Herbicides			
	Dimethoate	ltr	2.00	23.30
	Drusban	ltr	1.00	23.30
	Fungicides			
	Mancozet	kg	2.00	16.70
	Maneb	kg	2.00	16.70
	Spraying (diesel)	ltr	208.00	1.06
<b>Pepper</b>	Ploughing/harrowing	Hr	6.00	16.70
	Fertilizer			
	Urea	kg	200.00	0.83
	DAP	kg	100.00	0.67
	Herbicides			
	Attrazine	ltr	-	33.30
	2-4D	ltr	-	16.70
	Insecticides			
	Fungicides	kg	-	33.30
	Thiram	kg	-	33.30
	Seed	kg	0.33	41.60
	Herbicides			
	Dimethoate	ltr	2.00	23.30
	Drusban	ltr	1.00	23.30
	Fungicides			
	Mancozet	kg	1.00	16.70
	Maneb	kg	1.00	16.70
	Spraying (diesel)	ltr	208.00	1.06

Crops	Inputs	Unit of measure	Qty of Input/ ha	Unit Price (US\$)
Cabbage	Ploughing/harrowing	Hr	6.00	16.70
	Fertilizer			
	Urea	kg	200.00	0.83
	DAP	kg	100.00	0.67
	Herbicides			
	Attrazine	ltr	-	33.30
	2-4D	ltr	-	16.70
	Insecticides			
	Fungicides	kg	-	33.30
	Thiram	kg	-	33.30
	Seed	kg	0.31	26.11
	Herbicides			
	Dimethoate	ltr	3.00	23.30
	Drusban	ltr	3.00	23.30
	Fungicides			
	Mancozet	kg	1.00	16.70
	Maneb	kg	1.00	16.70
	Spraying (diesel)	ltr	208.00	1.06
Lettuce	Ploughing/harrowing	Hr	6.00	16.70
	Fertilizer			
	Urea	kg	200.00	0.83
	DAP	kg	100.00	0.67
	Herbicides			
	Attrazine	ltr	-	33.30
	2-4D	ltr	-	16.70
	Insecticides			
	Fungicides	kg	-	33.30
	Thiram	kg	-	33.30
	Seed	kg	0.21	42.20
	Herbicides			
	Dimethoate	ltr	3.00	23.30
	Drusban	ltr	2.00	23.30
	Fungicides			
	Mancozet	kg	1.00	16.70
	Maneb	kg	1.00	16.70
	Spraying (diesel)	ltr	208.00	1.06
Swiss chard	Ploughing/harrowing	Hr	6.00	16.70
	Fertilizer			
	Urea	kg	200.00	0.83
	DAP	kg	100.00	0.67
	Herbicides			
	Attrazine	ltr	-	33.30
	2-4D	ltr	-	16.70
	Insecticides			
	Fungicides	kg	-	33.30
	Thiram	kg	-	33.30
	Seed	kg	0.31	26.90
	Herbicides			
	Dimethoate	ltr	3.00	23.30
	Drusban	ltr	2.00	23.30
	Fungicides			
	Mancozet	kg	1.00	16.70
	Maneb	kg	1.00	16.70
	Spraying (diesel)	ltr	208.00	1.06

Crops	Inputs	Unit of measure	Qty of Input/ha	Unit Price (US\$)
Onion	Ploughing/harrowing	Hr	6.00	16.70
	Fertilizer			
	Urea	kg	200.00	0.83
	DAP	kg	100.00	0.67
	Herbicides			
	Attrazine	ltr	-	33.30
	2-4D	ltr	-	16.70
	Insecticides			
	Fungicides	kg	-	33.30
	Thiram	kg	-	33.30
	Seed	kg	0.23	43.70
	Herbicides			
	Dimethoate	ltr	3.00	23.30
	Drusban	ltr	2.00	23.30
	Fungicides			
	Mancozet	kg	1.00	16.70
	Maneb	kg	1.00	16.70
	Spraying (diesel)	ltr	208.00	1.06

**Table 21: Debub: Crop Development Programme - Rainfed and Supplementary Irrigation<sup>1</sup>: Targets and Inputs per**

Crops	Inputs		Unit of measure	Qty of Input/ha	Unit Price
<b>Sorghum</b>	Seed		kg	12.00	1.03
	1. Tractor Services: Ploughing/harrowing/ ridging		hr	12.00	16.00
	2. Fertilizer				
		Urea	kg	50.00	0.67
		DAP	kg	100.00	0.83
	3. Processing: Threshing, packing, storage, transport		LS	1.00	208.00
<b>Maize</b>	Seed		kg	30.00	1.49
	1. Tractor Services: Ploughing/harrowing/ ridging		hr	12.00	16.00
	2. Fertilizer				
		Urea	kg	50.00	0.67
		DAP	kg	100.00	0.83
	3. Processing		LS	1.00	26.00
<b>Wheat</b>	Seed		kg	12.00	1.58
	1. Tractor Services: Ploughing/harrowing/ ridging		hr	12.00	16.00
	2. Fertilizer				
		Urea	kg	50.00	0.67
		DAP	kg	100.00	0.83
	3. Processing		LS	1	199.00
<b>Barley</b>	Seed		kg	102	1.52
	1. Tractor Services: Ploughing/harrowing/ ridging		hr	12.00	16.00
	2. Fertilizer				
		Urea	kg	50.00	0.67
		DAP	kg	100.00	0.83
	3. Processing: Threshing, packing, storage, transport		LS	1	199.00
<b>Chick Pea</b>	Seed		kg	80	1.33
	1. Tractor Services: Ploughing/harrowing/ ridging		hr	12.00	16.00
	2. Fertilizer				
		Urea	kg	-	0.67
		DAP	kg	-	0.83
	3. Processing		LS	1	356.00
<b>Lentil/Faba bean</b>	Seed		kg	20	1.33
	1. Tractor Services: Ploughing/harrowing/ ridging		hr	12.00	16.00
	2. Fertilizer				
		Urea	kg	-	0.67
		DAP	kg	-	0.83
	3. Processing		LS		356.00



**Table 22: Spate Irrigation Inputs, Input Unit Price**

Crops	Inputs	Unit of measure	Qty of Input/ ha	Unit Price (US\$)
Sorghum	Ploughing/harrowing	Hr	12.00	16.70
	Fertilizer			
	Urea	kg	92.90	0.83
	DAP	kg	46.50	0.67
	Herbicides			
	Attrazine	ltr	0.47	33.30
	2-4D	ltr	0.47	16.70
	Insecticides			
	Fungicides	kg	0.93	33.30
	Thiram	kg	0.19	33.30
	Seed	kg	12.00	1.30
Maize	Ploughing/harrowing	Hr	12.00	16.70
	Fertilizer			
	Urea	kg	92.90	0.83
	DAP	kg	46.50	0.67
	Herbicides			
	Attrazine	ltr	0.47	33.30
	2-4D	ltr	0.47	16.70
	Insecticides			
	Fungicides	kg	0.93	33.30
	Thiram	kg	0.19	33.30
	Seed	kg	30.00	1.49

**Table 22: Horticultural Crops - Seed Procurement Requirement PY<sup>1</sup>**

Crops	Target cropping Area (ha)	Seed Rate per ha (kg)	Total seed (kg)	Unit Price (kg) US\$	Total
Potato	10	2,000	20,000	3.24	64,800.00
Tomato	500	0.25	125	62.30	7,787.50
Onion	300	0.23	69	43.70	3,015.30
Cabbage	400	0.31	124	36.60	4,538.40
Lettuce	400	0.21	84	42.20	3,544.80
Swiss Chard	400	0.31	124	26.90	3,335.60
Pepper	500	0.33	165	41.60	6,864.00
<b>Total</b>	<b>2,500</b>		<b>691</b>		<b>29,086</b>

**Table 23: Field Crop - Seed Procurement PY<sub>1</sub>**

Crops	Target cropping Area (ha)	Seed Rate per ha (kg)	Total seed (kg)	Unit Price (kg) US\$	Total
Sorghum	2,000	12.00	24,000	1.03	24,720.00
Maize	1,000	30.00	30,000	1.49	44,700.00
Finger millet	1,000	40.00	40,000	0.67	26,800.00
Barley	1,000	102.00	102,000	1.59	162,180.00
Wheat	1,000	120.00	120,000	1.59	190,800.00
Chick pea	500	80.00	40,000	1.33	53,200.00
Pearl Millet	500	15.00	7,500	0.70	5,250.00
<b>Total</b>	<b>7,000</b>		<b>363,500</b>		<b>507,650</b>

**Table 24: Spate Irrigation**

Crops	Target cropping Area (ha)	Seed Rate per ha (kg)	Total seed (kg)	Unit Price (kg) US\$	Total
Maize	250	30	7,500	1.49	11175
Sorghum	200	12	2,400	1.03	2472
<b>Total</b>	<b>450</b>		<b>9,900</b>		<b>13,647</b>

Table 25: Rangeland Development Programme - Targets/Inputs/Unit Costs

Investment Cost	Quantities								Unit Cost (US\$)
	Unit	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Total	
1.1 Establishment of permanent closures	ha	500.00	1,000.00	1,000.00	-	-	-	2,500.00	-
Grass seeds	kg	300.00	500.00	500.00	-	-	-	1,300.00	28.00
Legume seeds	kg	700.00	1,500.00	1,500.00	-	-	-	3,700.00	28.00
Oversowing and reseeding	ha	500.00	1,000.00	1,000.00	-	-	-	2,500.00	1.75
1.2 Establishment of Temporary closures	ha	1,000.00	2,000.00	2,500.00	1,500.00	1,000.00	1,000.00	9,000.00	
Grass seeds/local	kg	200.00	400.00	500.00	250.00	250.00	250.00	1,850.00	14.20
Legume seeds/local	kg	1,000.00	2,000.00	2,500.00	1,500.00	1,000.00	1,000.00	9,000.00	3.52
Oversowing and reseeding	ha	1,000.00	2,000.00	2,500.00	1,500.00	1,000.00	1,000.00	9,000.00	1.75
1.3 Conservation activities	ha	40.00	80.00	100.00	60.00	40.00	40.00	360.00	20.00
1.4 Livestock watering points								-	
Pond construction	No	1.00	2.00	2.00	-	-	-	5.00	25,000.00
Trough construction	No	2.00	4.00	4.00	-	-	-	10.00	2,000.00
Training of trainers (5 days)	No	12.00	-	-	12.00	-	-	24.00	10.00
Training of Beneficiaries (3 days)	No	200.00	200.00	200.00	200.00	100.00	100.00	1,000.00	3.00
Supervision	p/day	48.00	48.00	48.00	48.00	48.00	48.00	288.00	5.00

**Table 26: Livestock Development - Smallholder Dairy Programme: Basic Inputs Requirement and Unit Price**

Sub-Component/Activities		Items of Expenditure	Unit of measure	Inputs Requirement						Unit Cost (\$)
				PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	
1. Smallholder Dairy Development										
	1.1 Selection of breed, inspection of beneficiary rearing facilities, selection, organisation and training of beneficiaries <sup>1</sup>	Travels	person days (staff)	240.0	-	-	-	-	-	20.0
	1.2 Distribution and installation of Dairy animals	Supply of dual purpose in-calf cows <sup>2</sup>	No	128.0	100.0	-	-	-	-	1,700.0
	1.3 Management training of beneficiaries <sup>3</sup>	per diem, supplies and materials (lump sum)	Groups	13.0	10.0	-	-	-	-	100.0
	1.4 Monitoring/supervision <sup>4</sup>	Staff travels (lump sum)	Set of ben	1.0	1.0	2.0	2.0	2.0	3.0	50.0
2. Provision of milking machines <sup>5</sup>										
	2.1 Purchase and distribution of portable milking machines/cans	Machines and milk cans	Package	2.0	4.0	4.0	2.0	-	-	1,400.0
	2.2 Training of farmers on the operation of portable milking machines	Staff time, materials and suplies	Farmers groups	10.0	20.0	-	-	-	-	30.0
3. Milk collection <sup>6</sup>										
	3.1 Milk collection centres	Milk cooling machine with key spare parts and building	No	1.0	1.0	-	-	-	-	100,000.0
	3.2 Quality control	Quality control equipment	LS	1.0	1.0	-	-	-	-	50,000.0
		Supplies and materials - chemicals, etc	LS		1.0	1.0	1.0	1.0	1.0	13,000.0
	3.3 Training of farmers on management of milk collection centres - 5 days	Perdiem, supplies and materials	No	20.0	10.0	-	-	-	-	25.0
	3.4 Purchase of a milk van	Milk delivery vehicle	No	1.0	-	-	-	-	-	133,000.0

1) The dairy cows will be supplied through credit in kind; and repayment will also be in-kind through supply of 2 heifers to other farmers

2) Livestock expert and beneficiary representative will travel to Tesseney for selection. After inspection of facilities and training - 10 trips planned - 10 animals will be selected per trip of 7 days

3) 2 days management training for each group of 10 beneficiaries. Training cost includes lunch, supplies and materials. A lump sum of USD100 per group of 10 beneficiaries

4) A visit planned for every 2 months by livestock extension officer and quarterly visits by livestock expert. Assuming that 5 operators will be visited per day. Livestock expert visit will be on demand where the extension officer cannot provide the se

5) Unit package 1 portable milking machine with 20 - 40 litres milk cans for a group of 30 small dairy units. Unit will be supplied on credit for repayment into a revolving dairy development account

6) Milk collection centres are planned for Adi Keih, Adi Quala, and Dubarway: Farmers will be organised to operate the centre and to repay in real terms the investment cost into the dairy development revolving account

**Table 27: Animal Health Services Support (Antibiotics, Medicines, Vaccines)**

S/No	Category	List of Drugs/Medicine (sub category)	Unit	Quantity		Estimated Unit	Budget for		Total Cost (USD)
				PY1	PY2		PY1	PY2	
1	Antibiotics for large animals	1.Oxyteracycline 20%	100ml	1500	1500	2.53	3795	3795	7,590
		2.Oxyteracycline 5%	100ml	1750	1750	1.67	2922.5	2922.5	5,845
		3.Oxyteracycline 10%		2000	2000	2.4	4800	4800	9,600
		4.Procaine Penicilli	vial	1750	1750	1.2	2100	2100	4,200
		5.Distilled Water	vial	1750	1750	0.13	227.5	227.5	455
		6.Pinstrep	100ml	1250	1250	2.53	3162.5	3162.5	6,325
		7.Tylocine	100ml	250	250	3.87	967.5	967.5	1,935
		8.Sufadimidine sodium 33%	250ml	125	125	1.3	162.5	162.5	325
		9.Intramammary Drug (Miking Cow Penstrep)	pack of 20 syringe	100	100	5.77	577	577	1,154
		10.Intramammary Drug (Dry cow Penstrep)	pack of 20 syringe	100	100	5	500	500	1,000
		11.Intramammary Drugs (Gentamycine)	pack of 20 syringe	100	100	6	600	600	1,200
		12.Intra Uterine Bolus	bolus	200	200	1	200	200	400
		13.Intrauterine Drug (Oxyterercycline 10%)	100ml	100	100	1.33	133	133	266
		14.Intrauterine Drug (Neomycine Suphate)	50ml	100	100	2	200	200	400
		15.Oxy Spray	Tin of 250 ml	300	300	3.33	999	999	1,998
		16.Chloro tetracycline spray	270ml	200	200	3.13	626	626	1,252
	Antibiotics For Poultry	17.Chloro tetracycline	kg	250	250	10.2	2550	2550	5,100
		18.Flamequine 20%	kg	150	150	12.13	1819.5	1819.5	3,639
	Anti-fungal drugs	19.(Griseofulvin or Ketoconazole)	LS	200	200	2.33	466	466	932
	<b>Sub total</b>			<b>12175</b>	<b>12175</b>	<b>67.85</b>	<b>26808</b>	<b>26808</b>	<b>53616</b>
2	Anthelmentics	1.Ivomiec Injection	50ml	2000	2000	3	6000	6000	12,000
		2.Ivomec Drinch	Litre	1250	1250	10	12500	12500	25,000
		3.Albendazol Solution	Litre	2250	2250	4.2	9450	9450	18,900
		4.Albendazol Boluses of different sizes	Bolus	15,000	15000	0.24	3600	3600	7,200
		5.Oxyclozanide or rafoxynide	Lite	100	100	10.67	1067	1067	2,134
	<b>Sub total</b>			<b>20600</b>	<b>20600</b>	<b>28.11</b>	<b>32617</b>	<b>32617</b>	<b>65234</b>
3	Anti-Ectoparsites (Acaricides)	1.Cypermethrine 5-10%	Lit	500	500	9.33	4665	4665	9,330
		2.Ectodip	Lit	250	250	26.53	6632.5	6632.5	13,265
	<b>Sub total</b>			<b>750</b>	<b>750</b>	<b>35.86</b>	<b>11297.5</b>	<b>11297.5</b>	<b>22595</b>
4	Anti-protozoa Drugs	1.Amprolium HCL	KG	100	100	22.8	2280	2280	4,560
		2.Berenil	Sacket	7500	7500	0.1	750	750	1,500
	<b>Sub total</b>			<b>7600</b>	<b>7600</b>	<b>22.9</b>	<b>3030</b>	<b>3030</b>	<b>6060</b>

S/No	Category	List of Drugs/Medicine (sub category)	Unit	Quantity		Estimated Unit	Budget for		Total Cost (USD)
				PY1	PY2		PY1	PY2	
5	Miscellaneous Drugs	1.Calcium boro-gluconate	500ml	200	100	3.67	367	367	734
		2.Stress Vitamins	100ml	150	75	1.67	125.25	125.25	251
		3.Oxy& Vitamins	Kg	350	175	11.33	1982.75	1982.75	3,966
		4.Multi-vitamin for Poultry	Kg	350	175	16.67	2917.25	2917.25	5,835
		5.Mineral licks of 10kg	Piece/No.	700	350	3	1050	1050	2,100
		6.Vitamin A,D,E Inj	100ml	150	75	2.4	180	180	360
		7.Indigestion powder of 100mg Sacket	Sacket	500	250	1.67	417.5	417.5	835
		8.Atropine Suplphate	100ml	50	25	1.4	35	35	70
		9.Lidocaine 2%	100ml	24	12	2.33	27.96	27.96	56
		10.General Anesthesia	100ml	18	9	3	27	27	54
		11.Udder Cream	kg	150	75	3.26	244.5	244.5	489
		12.Ecthomol ointment of 1Kg.	No.	60	30	11.58	347.4	347.4	695
		13.Dexamethasone	PK of 100 amp	6	3	25.17	75.51	75.51	151
		<b>Sub total</b>		<b>2708</b>	<b>1354</b>	<b>87.15</b>	<b>7797.12</b>	<b>7797.12</b>	<b>15596</b>
6	Antiseptics/Disinfectants	1.Salvon (5 Liter)	No.	48	24	7	168	168	336
		2.Alcohol	Liter	200	100	0.13	13	13	26
		3.Iodine Tincture	4litre	48	24	11.91	285.84	285.84	572
		4.Supersept	5litre	60	30	18.93	567.9	567.9	136
		5.Potassium Permanganate	kg	10	5	4.47	22.35	22.35	45
		6.Hydrogen Peroxide	litre	20	10	0.63	6.3	6.3	13
		7.Formaldehyde 40%	litre	40	20	10.2	204	204	408
		<b>Sub total</b>		<b>426</b>	<b>213</b>	<b>53.27</b>	<b>1267.39</b>	<b>1267.39</b>	<b>1536</b>
7	Hormones	1.Clorprosterol (Prostaglandin)	20ml	53	53	14.97	793.41	793.41	1586.82
		2.Oestroidal benzoit	50ml	80	80	14.2	1136	1136	2276
		3.Oxytocine	5ml	201	201	0.33	66.33	66.33	132.66
		<b>Sub total</b>		<b>334</b>	<b>334</b>	<b>29.5</b>	<b>1995.74</b>	<b>1995.74</b>	<b>3995.48</b>
8	Vaccines*								
	1.Compulsory Vaccines for poultry	1. New castle	Dose	29,000	29,000	0.00331	95.99	95.99	191.98
		2.Infectious Bursal Disease	Dose	21,500	21,500	0.0044	94.6	94.6	189.2
		3.ILT	Dose	14,500	14,500	0.028	406	406	812
		4.Infectious Coryza	Dose	7,250	7,250	0.028	203	203	406
	<b>Sub total</b>			<b>72,250</b>	<b>72,250</b>	<b>0</b>	<b>800</b>	<b>800</b>	<b>1,599</b>
	2.Non-Compulsory Vaccines (Chargeable Vaccines)	1.Anthrax Vaccine	Doses	25,000	25,000	0.12	3000	3000	6000
		2.Brucellousis(Partially Charged)	Doses	4,000	4,000	1.33	5320	5320	10.64
		3.FMD(Partially Charged)	Doses	3,799	3,799	2.02	7673.98	7673.98	15348
	<b>Sub total</b>			<b>32,799</b>	<b>32,799</b>	<b>3</b>	<b>15,994</b>	<b>15,994</b>	<b>21,359</b>
	<b>Total Vaccines</b>			<b>105,049</b>	<b>105,049</b>	<b>4</b>	<b>16,794</b>	<b>16,794</b>	<b>22,958</b>
	<b>GRAND Total</b>			<b>149,642</b>	<b>148,075</b>	<b>328</b>	<b>101,606</b>	<b>101,606</b>	<b>191,590</b>

**Table 28: Purchase of Veterinary Equipment**

S/No	List of Vet Equipments	Unit	Quantity	Estimated Unit Price(USD)	Total Cost (USD)
1	Obstetrical gloves	Pack of 100 pcs	68	10.46	711.28
2	Surgical gloves	Gloves of 100	60	23.43	1,405.80
3	Gauze(Big Size)	No.	40	33.26	1,330.40
4	Vaccination for Poultry	Dozen	12	2.64	31.68
5	Treatment Needle	Dozen	148	3.30	488.40
6	Cotton	No.	48	1.86	89.28
7	Vaccination Needle (1.80*10)	Dozen	148	3.30	488.40
8	Thermometer	Number	48	6.65	319.20
9	Catheter	Number	12	10.00	120.00
10	Bull holder	Number	12	10.00	120.00
11	Cut gat	Role	5	4.46	22.30
12	Silk	Role	5	7.07	35.35
13	Teat lancet	Number	10	0.82	8.20
14	Teat dilator	Number	10	0.41	4.10
15	Scalpel Blade No.21or 22 or 23	Pack of 100	72	2.96	213.12
16	Scalpel Handle	No.	6	4.30	25.80
17	Microscopic Slide	Pack of 100	10	1.95	19.50
18	Cover Slips	Pack of 100	10	0.82	8.20
19	Binocular Microscope electrical	No.	4	77.80	311.20
20	Vaccutainer Tube	Pack of 100	12	8.28	99.36
21	Vaccutainer Needle	Pack of 100	12	7.03	84.36
22	Specimen Bottles of Different Sizes	No.	400	0.87	348.00
23	Automatic Vaccination Syringes	No.	16	47.55	760.80
24	Burdizo Big	No.	8	28.80	230.40
25	Burdizo small	No.	8	42.84	342.72
26	Sutu Needles of Different Sizes	Dozen	14	3.36	47.04
27	Stomach Tubes	No.	12	25.49	305.88
28	Nylon syringes of 10ml	Pack of 100	15	28.80	432.00
29	Nylon syringes of 20ml	Pack of 100	15	28.90	433.50
30	Nylon Syringes of 50ml	Pack of 100	5	40.68	203.40
31	Forceps of Different sizes	Dozen	12	6.60	79.20
32	Scissors of Different sizes	Dozen	12	18.96	227.52
33	Needle Holder	Dozen	3	6.50	19.50
34	Boiler(Sterilizer)	Dozen	12	1.02	12.24
35	Analtical Balance	Dozen	2	640.00	1,280.00
	<b>Total</b>		<b>1286</b>	<b>1,141.17</b>	<b>10,658.13</b>

**Table 29: Veterinary Field Equipments**

S/No	List of Field Equipments and Shelves	Unit	Quantity	Estimated Unit Price(USD)	Total Cost (USD)
1	Sleeping bag	No.	25	36.26	906.50
2	Field bed	No.	25	27.67	691.75
3	Gown	No.	50	25.33	1,266.50
4	Over alls (Complasieni)	No.	50	23.33	1,166.50
5	Ice Boxes of big Size	No.	10	43.00	430.00
6	Drug Shelves with glasses (2.40m* 2.00m)	No.	6	934.00	5,604.00
	<b>Sub total</b>		<b>166</b>	<b>1,089.59</b>	<b>10,065.25</b>

**Table 30: Backyard Poultry Production**

	Unit of measure	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Total	Unit cost
Improved Pullet Supply	No	3,000	4,800	6,700	-	-	-	14,500	5
Vaccine storage equipment	No	30	48	67	-	-	-	145	67
Farmers organising and training	No	600	960	1,340	-	-	-	2,900	10
Stuff travel costs	No	-	-	-	-	-	-	-	1,000
Extension worker training (2 days)	No	18	-	18	-	-	-	36	20
Breeding centres	No	2		-	-	-	-	2	30,000



### PACKAGE III: GASH BARKA PROGRAMME

#### SEED DEVELOPMENT

**Table 31: Gash Barka - Seed Procurement in PY<sub>1</sub> (irrigated area)**

Crops	Cropping Area (ha)	Seed Rate per ha (kg)	Total procurement (kg)	Unit Price (kg) US\$	Total
Tomato	75	0.25	18.75	62.30	1,168.13
Onion	65	0.23	14.95	43.70	653.32
Pepper	65	0.33	21.45	41.60	892.32
<b>Total</b>	<b>205</b>		<b>55.15</b>		<b>2,714</b>

**Table 32: Gash Barka - Field Crops - Seed Production in PY<sub>1</sub>**

Crops	Cropping Area (ha)	Seed Rate per ha (kg)	Total procurement (kg)	Unit Price (kg) US\$	Total
Sorghum	2,000	12.00	24,000.00	1.03	24,720.00
Maize	500	30.00	15,000.00	1.49	22,350.00
Pearl millet	1,000	15.00	15,000.00	0.70	10,500.00
Sesame	-	-	-	-	-
Common Bean	-	-	-	-	-
<b>Total</b>	<b>3,500</b>		<b>54,000.00</b>		<b>57,570</b>

## IRRIGATION DEVELOPMENT

**Table 33: Surface Irrigation Development – Crop Allocations by Site**



### Note

- 1) Justified development only 160ha to be developed
- 2) At full design stage of the programme, the actual cropping pattern will be determined. The present plan provides for one crop per year, whereas experience indicates 3 crops/year
- 3) Technical support for utilization planning, production, and marketing will also be nailed down
- 4) Cost recovery policy will be defined
- 5) Operation and maintenance modality including cost sharing will be defined at full design

### Spate Irrigation

**NIL**

Covered fully under PCRRD

### Development Schedule

Sites	PY1	PY2	PY3	PY4	PY5	PY6	Total
Fanco	-	100.0	-	-	-	-	100.0
Gerset	-	100.0	-	-	-	-	100.0
Gogne	20.0	-	-	-	-	-	20.0
Mogolo	20.0	-	-	-	-	-	20.0
Shambuko	20.0	-	-	-	-	-	20.0
<b>Total</b>	<b>60.0</b>	<b>200.0</b>	-	-	-	-	<b>260.0</b>

**Table 34: Gash-Barka: Irrigation Development - Surface Irrigation - Investment Inputs**

Sub-Component/Activities	Inputs	Unit of measure	Qty of inputs/ ha	Area (ha)								Comments
				PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Total	Unit cost/ha	
<b>Surface Irrigation<sup>1</sup></b>												
Design of scheme <sup>4</sup>	ST/LB	person day	22.5	260.0	-	-	-	-	-	260.0	15.0	GOE/Beneficiary
Digging of wells <sup>1</sup>	contract	LS	1.0	60.0	200.0	-	-	-	-	260.0	834.0	
Water pumps <sup>2</sup>	contract	LS	1.0	60.0	200.0	-	-	-	-	260.0	117.0	
Galvanized pipes - 8 inch pipe	contract	LS	1.0	60.0	200.0	-	-	-	-	260.0	47.0	
PVC tube (50 mtr) <sup>3</sup>	contract	LS	1.0	60.0	200.0	-	-	-	-	260.0	20.0	
Land Development <sup>4</sup>	labour	person day	260.0	60.0	200.0	-	-	-	-	260.0	334.0	GOE and 20% by beneficiary

1) Digging of wells, equipping and water distribution system will be awarded on contract - 2 contracts planned

2) One well per 20 ha

3) One pump per well

4) Design and land preparation including land distribution will be by GOE and beneficiaries. Beneficiaries will contribute about 20% of cost

**Table 35: Input Requirement/ha - Irrigated crops: Gash-Barka**

Inputs	Unit of measure	Unit Price	Quantity of Inputs				
			Onion	Tomato	Pepper	Banana	Sorghum
Ploughing/harrowing	hr	16.0	10.0	10.0	10.0	100.0	12.0
Seed (Onion)	kg	46.7	5.0	-	-	-	-
Fertilizer							
DAP	kg	0.83	200.0	200.0	100.0	150.0	92.9
Urea	kg	0.67	100.0	100.0	50.0	100.0	46.5
Potash	kg	0.21	150.0	150.0	150.0	150.0	100.0
Insecticides							
Dimethoate	ltr	23.30	2.00	2.00	2.00	-	-
Drusban	ltr	23.30	2.00	1.00	1.00	-	-
Fungicides							
Mancozeb	kg	16.70	2.0	1.0	1.0	-	-
Maneb	kg	16.50	2.0	1.0	1.0	-	-
Thiram	kg	33.3	-	-	-	-	-
Spraying (diesel)	ltr	1.2	208.0	208.0	208.0	-	0.19
Seed (tomato)	kg	166.7	-	0.5	-	-	-
Seed (pepper)	kg	26.7	-	-	2.0	-	-
Suckers (banana)	No	0.2	-	-	-	1,200.0	-
Irrigation			-	-	-	-	-
Diesel	ltr	1.2				2,400.0	
Lubricant	ltr	2.7				6.0	
Herbicide							
Atrazine	ltr	33.3					0.47
2.4.D	ltr	16.7					0.47

**Table 36: Crop Development Programme - Rainfed and Spate Irrigation<sup>1</sup>: Gash Barka**

Crops	Inputs	Unit of measure	Qty of Input/ ha	Target Areas (ha)							Unit Price
				Project Year							
				1	2	3	4	5	6	Total	
Sorghum	1. Tractor Services: Ploughing/harrowing/ ridging	hr	12.00	-	3,000	-	-	-	-	3,000	16.00
	2. Fertilizer										
	Urea	kg	50.00	-	3,000	-	-	-	-	3,000	0.67
	DAP	kg	100.00	-	3,000	-	-	-	-	3,000	0.83
	3. Processing: Threshing, packing, storage, transport	LS	1.00	-	3,000	-	-	-	-	3,000	208.00
Maize	1. Tractor Services:	hr	12.00	-	2,000	2,000	-	-	-	4,000	16.00
	2. Fertilizer									-	
	Urea	kg	50.00	-	2,000	2,000	-	-	-	4,000	0.67
	DAP	kg	100.00	-	2,000	2,000	-	-	-	4,000	0.83
	3. Labour; Planting, weeding, rigueing, bird scaring, harvesting	person day	108.00	-	2,000	2,000	-	-	-	4,000	3.30
	4. Processing	LS	1.00	-	2,000	2,000	-	-	-	4,000	26.00
Pearl Millet	1. Tractor Services:	hr	12.00	-	2,000	2,000	-	-	-	4,000	16.00
	2. Fertilizer									-	
	Urea	kg	-	-	2,000	2,000	-	-	-	4,000	0.67
	DAP	kg	-	-	2,000	2,000	-	-	-	4,000	0.83
	3. Labour; Planting, weeding, rigueing, bird scaring, harvesting	person day	149.00	-	2,000	2,000	-	-	-	4,000	3.30
	4. Processing	LS		-	2,000	2,000	-	-	-	4,000	356.00
Sesame	1. Tractor Services:	hr	12	-	500	500	500	-	-	1500	16.00
	Others	LS	1	-	500	500	500	-	-	1500	25.00
	Seeds	kg	20	-	500	500	500	-	-	1500	1.20
Common Bean	1. Tractor Services:	hr	12	-	500	500	500	-	-	1500	16.00
	Others	LS	1	-	500	500	500	-	-	1500	25.00
	Seeds	kg	1500	-	500	500	500	-	-	1500	1.50
<sup>1)</sup> Will receive certified/improved seeds only.											

## LIVESTOCK DEVELOPMENT

**Table 37: Livestock Development - Range Improvement, Watering Points and Feed Storage**

Sub-Component/Activities		Items of Expenditure	Unit of measure	PY <sub>1</sub>	PY <sub>2</sub>	PY <sub>3</sub>	PY <sub>4</sub>	PY <sub>5</sub>	PY <sub>6</sub>	Unit Cost (\$)
1. Rangeland Development										
	1.1 Establishment of permanent closure	Seed procurement (0.4 kg/ha)	ha	500.0	1,500.0	2,000.0	2,000.0	2,000.0	2,000.0	0.8
		Over sowing - labour	ha	500.0	1,500.0	2,000.0	2,000.0	2,000.0	2,000.0	1.75
	1.2 Establishment of voluntary livestock exclusion area (temporary closure)	Seed procurement	ha	1,000.0	2,000.0	8,000.0	8,000.0	8,000.0	8,000.0	0.8
		Over sowing - labour	ha	1,000.0	2,000.0	8,000.0	8,000.0	8,000.0	8,000.0	1.75
	1.3 Hillside protection	Terracing, planting of trees, erosion control/SWC	ha	-	200.0	300.0	500.0	1,000.0	1,000.0	45.0
2. Livestock watering points		New ponds	No	-	1.0	1.0	1.0	-	-	25,000.0
		Rehabilitation of old points	No	1.0	1.0	1.0	-	-	-	8,000.0
		Troughs construction	No	1.0	2.0	2.0	1.0	-	-	1,400.0
3. Animal Feed Storage		construction	No	1.0	-	-	-	-	-	195,000.0



#### APPENDIX 4: ESTIMATED OUTPUTS

Crops	Area (ha)	Yield	Output
<b>Gash Barka</b>			
<b>Crops</b>			
Tomatoes	75 x 2 = 150	20 tons	3000 tons
Pepper	65 x 2 = 130	15 tons	19,500 tons
Onion	65 x 2 = 130	45 tons	5850 tons
Banana	55	40 tons	2200 tons
			<b>30,550 tons</b>
<b>Full Package</b>			
Sorghum	2000	2000	4000,000 kg
Maize	500	3000	1,500,000 kg
Pearl millet	1000	1800	1,800,000 kg
			<b>7,300,000 kg</b>
<b>Only Seed</b>			
Sorghum	3000	1200 kg	3,600,000 kg
Maize	4000	2500 kg	10,000,000 kg
Pearl Millet	4000	1000 kg	4000000 kg
Sesame	1500	1000 kg	1,500,000 kg
Common bean	1500	1200 kg	1,800000 kg
			<b>20,900,000 kg</b>
<b>Range Improvement</b>			
Permanent Closure	10,000	25 tons	250,000 tons
V L E A	35000	10 tons	350,000 tons
Hill side protection	3000	5 tons	15000 tons
			<b>615,000 tons</b>
<b>Dehub</b>			
Crops(existing areas)			
Tomatoes	250	20 tons	5000 tons
Onions	150	20 tons	3000 tons
Cabbage	200	20 tons	4000 tons
Lettuce	200	12 tons	2400 tons
Swiss Chard	200	30 tons	6000 tons
Pepper	200	15 tons	3000 tons
			<b>23400</b>
<b>New Irrigation</b>			
Tomatoes	55 x 2 = 110	20 tons	2200
Onion	55 x 2 = 110	20 tons	2200
Cabbage	24 x 2 = 48	20 tons	960 tons
Lettuce	17 x 2 = 34	12 tons	408 tons
Swiss Chard	17 x 2 = 34	30 tons	1020 tons
Pepper	45 x 2 = 90	15 tons	1350 tons
Potato	57 x 2 = 114	12.5 tons	1425 tons
			<b>9563 tons</b>
<b>Spate</b>			
Maize	2250	3000 kg	6,750,000
Sorghum	2200	2500 kg	5,500000
			<b>12,250,000</b>



Crops	Area (ha)	Yield	Output
<b>Ramfeed Seed Only</b>			
Sorghum	2000	1200 kg	2400,000 kg
Maize	1000	1500 kg	1500,000 kg
Finger Millet	1000	1200 kg	1,200,000 kg
Barley	1000	1500 kg	1,500,000 kg
Wheat	500	1500 kg	750000 kg
Chick Pea	500	1000 kg	500,000 kg
Pearl Millet	500	1000 kg	500,000 kg
Potatoes	1200	8000 tons	9,600,000kg
			<b>17,950,000 kg</b>
<b>Grass/Forages</b>			
Permanent Closure	1300	25 tons	32500 tons
Temporary Closure	9000	10 tons	90000 tons
Hill side Development	360	5 tons	1800 tons
			<b>124300</b>
<b>Dehub</b>			
<b>Livestock</b>	No	Yield	Output Lists
Dairy Cows	912	6-8 Litres (average 7 litre per day)x 180	1,149,120 Litres
Bee keeping (Livres)	10,000	35 kg	350,000 kg
Birds(Pillets/horn )for sale	3132000	1.5 kg	4,698,000
Stock of Birds	69,600	1.5 kg	104,400 kg
Breeding House Sales of pillets	81,000	-	81,000
Beef(bulls)	912	250 kg	228,000 kg

## APPENDIX 5: FINANCIAL AND ECONOMIC ANALYSIS

### I. INTRODUCTION

The major investments planned under the PCRRDP Add-on are in the seed programme, to enable the ultimate beneficiaries enhance production through sustainable use of quality seeds. This effort is further supplemented by investments in irrigation development. Besides Crop Production, the Programme add-on also extends to investments in range land development, livestock development including backyard poultry, bee keeping and animal health services. Farm models presented in this working paper indicate that the proposed investments have the potential to increase the cash income of a 1.5 ha smallholding by ERN 10,112 for the Sorghum and Millet Farm model; ERN 13,746.9 for the Sorghum, millet, and maize farm model; barley, sorghum and Maize farm ERN 11,542. The Sorghum, Maize, Finger millet and Beans farm model shows an exceptional potential of increasing household income by ERN 194,261 mainly because of the high price of beans (this has been considered as outlier and excluded in the overall economic analysis). However, the expected gradual and partial adoption means that the anticipated financial benefit per household will generally be less than half this amount - but still sufficient to make a real difference to the lives of the beneficiaries.

Given this level of financial benefit increment to the target group it is not surprising that the Programme will also generate a high economic rate of return (ERR) – estimated to be around 20% and relatively insensitive to cost escalation, benefit reduction and delays.

### A. Programme Benefits

The table below shows that when the Programme is fully on course, it will have potential to generate gross economic benefits estimated at ERN 1,155,643,000 (USD 77 million) per annum.

Estimated Annual Production by Programme Year 4:

#### Estimated Benefits

	Estimated Annual Production	Kg/ Litres/No Nakfa	Average Price	Annual Benefits by PY4+- Nakfa '000
Grains	48,800	48,800,000	10	473,848,000
Potatoes	10,900	10,900,000	16	174,400,000
Bananas	2,200	2,200,000	20	44,000,000
Milk	1,500,000	1,500,000	20	29,925,000
Honey	300	300,000	180	54,000,000
Beef	137	137,000	60	8,220,000
Chickens	3,300,000	3,300,000	113	371,250,000
				1,155,643,000

After deducting Programme investment costs and recurring annual production costs, this translates into a net economic benefit of ERN 460 million after Programme Closure. It is estimated that about 34,150 households of which about 16,450 will be WHH will directly benefit from the add-on activities in agriculture and livestock. Therefore the average benefit per beneficiary per annum is estimated at ERN 13,469 (USD 898) which is sufficient to make a real difference in people's lives.

## II. FINANCIAL ANALYSIS

### A. Objectives

The objectives of this financial analysis are:

- to assess the financial viability of the improved production and value addition technologies and systems promoted by the Programme for farmers and their households;
- to examine the impact of Programme interventions on cash flow, and incomes; and
- to use crop models to demonstrate that there is sufficient financial incentive for typical smallholder households to participate in the Programme. The purpose of farm modelling is to illustrate how the Programme interventions will bring about increasing and positive returns to labour; and the incremental value of specific input mixes.

### B. Main Assumptions

**Prices:** The financial prices of inputs and products were derived from information obtained during the field visits and discussions with officers in the Ministry of Agriculture. Most of the prices have generally increased between 2007 and 2008. The prices for outputs have been based on 2008 and this partly explains the high ERR. Information on labour requirements for various operations, prevailing wage rates, yields, input use, farm gate and market prices of the crops, input prices and farm-to-market transport costs were compiled by the Ministry of Agriculture Staff.

**Labour:** It is assumed that farm labour is provided by the households and hired labour is used in conjunction with family labour. It is expected that a household would hire any additional labour requirement.

### C. Crop Budgets

Crop budgets presented included the following crops: Sorghum, Pearl Millet, Maize, Barley, Fingure Millet, and Beans. The major assumptions underlying the “Without Programme” situation the yields are generally low mainly due to: lack of appropriate seed/planting material, low soil fertility, and crop diseases and pests due to climatic conditions and poor access to inputs and insufficient knowledge about their use. The models indicate that the financial incentives are sufficient to attract the participation of target beneficiaries.

- Sorghum yields are shown in the crop model to increase from 500 kg/ha to 1,200kg/ha with net margins increasing from ERN -1,067 to ERN 3,827
- Pearl Millet Yields are shown in the crop model to increase from 500 kg/ha to 1,800 kg/ha with net margins increasing from ERN – 923 to ERN 9,513
- In the Maize Crop model yields are shown increasing from 2,000 kg/ha to 3,000 kg/ha with net margins increasing from ERN 13,384 to ERN 20,652
- Barley Yields are shown in the crop model to increase from 1,000 kg/ha to 2,500 kg/ha with net margins increasing from ERN 2,586.2 to ERN 13,509
- Fingure Millet Yields are shown in the crop model to increase from 500 kg/ha to 1,200 kg/ha with net margins increasing from ERN -1,046 to ERN 3,442.5
- Bean Yields are shown in the crop model to increase from 1,500kg/ha to 3,000 kg/ha with net margins increasing from ERN 368,280 to ERN 740,152; exceptionally different from other crop models because of the high price of beans in Eritrea.

## **D. Farm Models**

**Overview:** Five farm models are presented in the appendix reflecting various crop mixes: Sorghum and Millet farm model; Sorghum, Millet and Maize farm model; Barley, Sorghum and Maize farm model; Sorghum, Maize, Finger Millet and Beans Farm Model. The models show that farmers would achieve a level of production output and financial returns that are attractive in relation to their labour and other input investment. The models estimate the impact of improved technologies on farm incomes. Because of tractor use in the with Programme scenario, the labour hours are shown as reducing in spite of the increase in productivity.

### **Sorghum and Millet Farm Model**

This model portrays a typical farming operation by an economically active poor household in Eritrea with 1.5 ha holding. Such household crop pattern reflects the family need for food and low rainfall situation and generally include 0.5 Ha used for Pearl Millet and 1 Ha used for sorghum. In the “with project” situation, the farmer will adopt an improved package of agronomic and commercial initiatives using improved inputs.

As a result of these changes, the model household is expected to increase Sorghum production from 500 kg to 1,200 kg and that of Pearl Millet from 250 kg to 900 kg. The farm’s annual income will rise from ERN -1,519 to ERN 8,583.6; an increase of ERN 10,112.9. This will be very attractive to farmers.

**Sorghum, Millet, and Maize Farm Model** – This model reflects operation of large families living in high rainfall area.

Again in the ‘with project’ situation, the farmer will change and use improved inputs as a result of improved inputs.

With a 2 ha farm and cropping pattern of 1.0 ha for Sorghum, 0.5 ha pearl millet, and another 0.5 ha for maize. As a result of use of inputs and irrigation, the model household is expected to increase Sorghum production from 500 kg to 1,200 kg, Maize from 1,000 kg to 1,500 kg and that of Pearl Millet from 250 kg to 900 kg. The farm’s annual income will rise from ERN 5,162.7 to ERN 18,909.6

There are more farm models shown in the appendix but they all come to the same result.

## **III. ECONOMIC ANALYSIS**

From the anticipated benefits, Programme Costs and production running costs, an economic analysis has been undertaken as per the table below. The table has the following parts:

Part I: Quantification of representative benefits.

Part II: Adoption rate, because it is understood that such a level of economic benefit will be achieved gradually and will be only at that level in PY4+

Part III: The scaled down economic benefits which is the totals in part I multiplied by the totals in part II.

Part IV: Programme Investment costs derived from the Programme cost tables

Part V: Production running costs derived from available crop models

Part VI: The net economic benefits which equals to part III less part IV and less part V.

**The benefits accruing from the investment in National Veterinary Laboratory and Poultry feed are of a national nature; are complimentary to other GOE efforts and have not been estimated and have not been included in the analysis.**

Derivation of Economic Benefits and Results of the Programme

Estimated Benefits					Programme Year										
		Estimated Annual Production	Kg/ Litres/No Nakfa	Average Price	Annual Benefits by PY4+- Nakfa '000	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10+
	Grains	48,800	48,800,000	10	473,848,000										
	Potatoes	10,900	10,900,000	16	174,400,000										
	Bananas	2,200	2,200,000	20	44,000,000										
	Milk	1,500,000	1,500,000	20	29,925,000										
	Honey	300	300,000	180	54,000,000										
	Beef	137	137,000	60	8,220,000										
	Chickens	3,300,000	3,300,000	113	371,250,000										
					1,155,643,000										
I	Annual Benefits at full Programme-benefit level					1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000
II	Adoption/ Roll-out rate					0.10	0.30	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00
III= (I) x (II)	Scaled down annual benefits					115,564,300	346,692,900	693,385,800	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000	1,155,643,000
IV= (Per cost tables)	Programme Investment Costs					115,699,717	52,594,360	36,943,064	6,613,290	6,721,199	6,536,300	225,107,930			
V= per crop models	Other running production costs														
		Note	Targets- Kgs/ Litres/ No	Unit Production Cost	Total Production Cost										
	Grains	1	48,800,000	4.05	197,802,667	197,802,667	197,802,667	197,802,667	197,802,667	197,802,667	197,802,667	197,802,667	197,802,667	197,802,667	197,802,667
	Potatoes	2	10,900,000	12.44	135,548,040	135,548,040	135,548,040	135,548,040	135,548,040	135,548,040	135,548,040	135,548,040	135,548,040	135,548,040	135,548,040
	Bananas	3	2,200,000	9	29,774,861	29,774,861	29,774,861	29,774,861	29,774,861	29,774,861	29,774,861	29,774,861	29,774,861	29,774,861	29,774,861
	Dairy Unit (Milk & Beef)	4	1,500,000	13.53	54,735,000	54,735,000	54,735,000	54,735,000	54,735,000	54,735,000	54,735,000	54,735,000	54,735,000	54,735,000	54,735,000
	Honey	5	300,000	36.49	23,133,333	23,133,333	23,133,333	23,133,333	23,133,333	23,133,333	23,133,333	23,133,333	23,133,333	23,133,333	23,133,333
	Backyard Poultry	6	3,300,000	77.11	254,466,667	254,466,667	254,466,667	254,466,667	254,466,667	254,466,667	254,466,667	254,466,667	254,466,667	254,466,667	254,466,667
					695,460,568	695,460,568	695,460,568	695,460,568	695,460,568	695,460,568	695,460,568	695,460,568	695,460,568	695,460,568	695,460,568
VI = III less IV less V	Net Incremental Benefits (total in line I less line II less line III)					- 695,595,985	- 401,362,028	- 39,017,831	453,569,143	453,461,233	453,646,132	235,074,502	460,182,432	460,182,432	460,182,432

Notes:

- 1/ The farm models show that on average NK 17,024 in production running costs would be needed to achieve a yield of 4,200 Kg. The production unit cost has been estimated as 22,500 Nk divided by 4,200 Kg.
- 2/ The farm models show that on average NK15,544.50 would be required to achieve a yield of 1.25 tons. The production unit cost has been estimated as 15,544.50 Nk divided by 1,250 Kg.
- 3/ The farm models show that on average NK12,000 would be required to achieve a yield of 1,300 tons. The production unit cost has been estimated as 12,000 Nk divided by 1,300Kg.
- 4/ The Dairy Unit farm model shows that to run a yield of 2,160 litres of milk on a smallholder farm, the running costs would be NK 29,233.50. The production cost has been estimated as NK 29,233.50 divided by 2,160 litres
- 5/ The Honey model shows that to run a yield of 150 kg, the running costs would be NK 5,473.50. The production cost has been estimated as NK 5,473.50 divided by 150 kgs.
- 6/ The backyard poultry model shows that 810 birds the annual running costs would be NK 62,460. The production cost has been estimated as NK 62,460 divided by 810 birds.

ERR = 20%

The results of the economic analysis justify the Programme's investments. The analysis shows that the Programme has the capacity to generate an economic rate of return (ERR) of 20% percent over a 20-year period.

Sensitivity analysis. A number of scenarios were tested to establish the economic viability of the total Programme in the event of adverse factors. The ERR is relatively stable with regard to cost increases, benefits reductions and time lags; except for the 10% decrease in benefits and increase in costs which show a 6 % drop but still leaving a high ERR of 14%.

20	ERR for Overall Programme- Base Case
14	ERR if benefits decrease by 10%
14	ERR if costs increase by 10%
18	ERR if benefits lag by one year
18	ERR if benefits lag by two years
20	ERR if benefits decrease by 20% p.a after PY10

## Attachment 1: Crop Models

### Sorghum Crop Model

Eritrea

Post Crisis Rural Recovery and Development Programme- Add on

Sorghum- Rain Fed Crop Model

#### FINANCIAL BUDGET

(In ERN Per ha)

	Existing Technology	New Technology
Revenue	4,725.0	11,340.0
<b>Input costs</b>		
Improved Sorghum Seed	-	185.4
Un Improved Sorghum Seed	92.4	-
Tractor Services	1,200.0	2,400.0
UREA	-	622.5
DAP	-	1,005.0
<b>Sub-total Input costs</b>	<b>1,292.4</b>	<b>4,212.9</b>
<b>Income (Before Labor Costs)</b>	<b>3,432.6</b>	<b>7,127.1</b>
<b>Labor costs</b>		
Labour	4,500.0	3,300.0
<b>Income (After Labor Costs)</b>	<b>-1,067.4</b>	<b>3,827.1</b>

Income Before Labor: IRR = None, NPV = 27,937.82

Income After Labor: IRR = None, NPV = 37,012.22

Eritrea

Post Crisis Rural Recovery and Development

Sorghum- Rain Fed Crop Model

#### YIELDS AND INPUTS

(Per ha)

		Jan. -- Dec.	
		Existing Technology	New Technology
	Unit	1 to 21	1 to 21
Yields	kg	500	1,200
<b>Operating</b>			
<b>Inputs</b>			
Improved Sorghum Seed	kg	-	12
Un Improved Sorghum Seed	kg	12	-
Tractor Services	Hour	5	10
UREA	kg	-	50
DAP	kg	-	100
<b>Labor</b>			
Labour	day	300	220

## Pearl Millet Crop Model

Eritrea Post Crisis Rural Recovery and Development Pearl Millet Crop Model		
<b>FINANCIAL BUDGET</b> (In ERN Per ha)	<b>Jan. -- Dec.</b>	
	<b>Existing</b>	<b>New</b>
	<b>Technology</b>	<b>Technology</b>
	<b>1 to 21</b>	<b>1 to 21</b>
Revenue	4,855.0	17,478.0
<b>Input costs</b>		
Improved Pearl Millet Seed	-	157.5
Unimproved Pearl Millet Seed	78.8	-
Tractor Services	1,200.0	2,880.0
UREA	-	622.5
DAP	-	1,005.0
<b>Sub-total Input costs</b>	<b>1,278.8</b>	<b>4,665.0</b>
<b>Income (Before Labor Costs)</b>	<b>3,576.3</b>	<b>12,813.0</b>
<b>Labor costs</b>		
Labour	4,500.0	3,300.0
<b>Income (After Labor Costs)</b>	<b>-923.8</b>	<b>9,513.0</b>

Income Before Labor: IRR = None, NPV = 69,848.33

Income After Labor: IRR = None, NPV = 78,922.74

Eritrea			
Post Crisis Rural Recovery and Development Proj			
Pearl Millet Crop Model			
<b>YIELDS AND INPUTS</b>		<b>Jan. -- Dec.</b>	
(Per ha)			
		<b>Existing</b>	<b>New</b>
		<b>Technology</b>	<b>Technology</b>
		<b>1 to 21</b>	<b>1 to 21</b>
	<b>Unit</b>		
Yields	kg	500	1,800
<b>Operating</b>			
<b>Inputs</b>			
Improved Pearl Millet Seed	kg	-	15
Unimproved Pearl Millet Seed	kg	15	-
Tractor Services	Hour	5	12
UREA	kg	-	50
DAP	kg	-	100
<b>Labor</b>			
Labour	day	300	220



## Maize Crop Model

Eritrea		
Post Crisis Rural Recovery and Development		
Maize Crop Model		
<b>FINANCIAL BUDGET</b>	<b>Jan. -- Dec.</b>	
(In ERN Per ha)	<b>Existing Technology</b>	<b>New Technology</b>
	<b>1 to 21</b>	<b>1 to 21</b>
Revenue	19,420.0	29,130.0
<b>Input costs</b>		
Improved Maize Seed	-	670.5
Un-Improved Maize Seed	336.0	-
Tractor Services	1,200.0	2,880.0
UREA	-	622.5
DAP	-	1,005.0
<b>Sub-total Input costs</b>	<b>1,536.0</b>	<b>5,178.0</b>
<b>Income (Before Labor Costs)</b>	<b>17,884.0</b>	<b>23,952.0</b>
<b>Labor costs</b>		
Labour	4,500.0	3,300.0
<b>Income (After Labor Costs)</b>	<b>13,384.0</b>	<b>20,652.0</b>

Income Before Labor: IRR = None, NPV = 45,886.24

Income After Labor: IRR = None, NPV = 54,960.64

Eritrea			
Post Crisis Rural Recovery and Development			
Maize Crop Model			
<b>YIELDS AND INPUTS</b>		<b>Jan. -- Dec.</b>	
(Per ha)		<b>Existing</b>	<b>New</b>
		<b>Technology</b>	<b>Technology</b>
	<b>Unit</b>	<b>1 to 21</b>	<b>1 to 21</b>
Yields	kg	2,000	3,000
<b>Operating</b>			
<b>Inputs</b>			
Improved Maize Seed	kg	-	30
Un-Improved Maize Seed	kg	30	-
Tractor Services	Hour	5	12
UREA	kg	-	50
DAP	kg	-	100
<b>Labor</b>			
Labour	day	300	220

## Barley Crop Model

Eritrea		
Post Crisis Rural Recovery and Development		
Barley Crop Model		
<b>FINANCIAL BUDGET</b>	<b>Jan. -- Dec.</b>	
(In ERN Per ha)	<b>Existing Technology</b>	<b>New Technology</b>
	<b>1 to 21</b>	<b>1 to 21</b>
Revenue	9,500.0	23,750.0
<b>Input costs</b>		
Improved Barlet Seed	-	2,432.7
Unimproved Barley Seed	1,213.8	-
Tractor Services	1,200.0	2,880.0
UREA	-	622.5
DAP	-	1,005.0
<b>Sub-total Input costs</b>	<b>2,413.8</b>	<b>6,940.2</b>
<b>Income (Before Labor Costs)</b>	<b>7,086.2</b>	<b>16,809.8</b>
<b>Labor costs</b>		
Labour	4,500.0	3,300.0
<b>Income (After Labor Costs)</b>	<b>2,586.2</b>	<b>13,509.8</b>

Income Before Labor: IRR = None, NPV = 73,529.89

Income After Labor: IRR = None, NPV = 82,604.30

Eritrea		
Post Crisis Rural Recovery and Development		
Barley Crop Model		
<b>YIELDS AND INPUTS</b>	<b>Jan. -- Dec.</b>	
(Per ha)	<b>Existing Technology</b>	<b>New Technology</b>
	<b>1 to 21</b>	<b>1 to 21</b>
<b>Unit</b>		
Yields	kg	1,000
<b>Operating</b>		
<b>Inputs</b>		
Improved Barlet Seed	kg	-
Unimproved Barley Seed	kg	102
Tractor Services	Hour	5
UREA	kg	-
DAP	kg	-
<b>Labor</b>		
Labour	day	300

## Finger Millet Crop Model

Eritrea			
Post Crisis Rural Recovery and Development Prc			
Finger Millet Crop Model			
<b>FINANCIAL BUDGET</b>			
(In ERN Per ha)			
	<b>Jan. -- Dec.</b>		
	<b>Existing</b>	<b>New</b>	
	<b>Technology</b>	<b>Technology</b>	
	<b>1 to 21</b>	<b>1 to 21</b>	
Revenue	4,855.0	11,652.0	
<b>Input costs</b>			
Improved Fingure Millet Seed	-	402.0	
Un-improved Fingure Millet Seed	201.0	-	
Tractor Services	1,200.0	2,880.0	
UREA	-	622.5	
DAP	-	1,005.0	
<b>Sub-total Input costs</b>	<b>1,401.0</b>	<b>4,909.5</b>	
<b>Income (Before Labor Costs)</b>	<b>3,454.0</b>	<b>6,742.5</b>	
<b>Labor costs</b>			
Labour	4,500.0	3,300.0	
<b>Income (After Labor Costs)</b>	<b>-1,046.0</b>	<b>3,442.5</b>	

Income Before Labor: IRR = None, NPV = 24,867.65

Income After Labor: IRR = None, NPV = 33,942.05

Eritrea			
Post Crisis Rural Recovery and Development Program			
Fingure Millet Crop Model			
<b>YIELDS AND INPUTS</b>			
(Per ha)			
		<b>Jan. -- Dec.</b>	
		<b>Existing</b>	<b>New</b>
		<b>Technology</b>	<b>Technology</b>
	<b>Unit</b>	<b>1 to 21</b>	<b>1 to 21</b>
Yields	kg	500	1,200
<b>Operating</b>			
<b>Inputs</b>			
Improved Fingure Millet Seed	kg	-	40
Un-improved Fingure Millet Seed	kg	40	-
Tractor Services	Hour	5	12
UREA	kg	-	50
DAP	kg	-	100
<b>Labor</b>			
Labour	day	300	220

## Beans Crop Model

Eritrea			
Post Crisis Rural Recovery and Developn			
Beans Crop Model			
<b>FINANCIAL BUDGET</b>		<b>Jan. -- Dec.</b>	
(In ERN Per ha)		<b>Existing</b>	<b>New</b>
		<b>Technology</b>	<b>Technology</b>
		<b>1 to 21</b>	<b>1 to 21</b>
Revenue		375,000.0	750,000.0
<b>Input costs</b>			
Improved Seed		-	2,040.0
Un-improved Seed		1,020.0	-
Tractor Services		1,200.0	2,880.0
UREA		-	622.5
DAP		-	1,005.0
<b>Sub-total Input costs</b>		<b>2,220.0</b>	<b>6,547.5</b>
<b>Income (Before Labor Costs)</b>		<b>372,780.0</b>	<b>743,452.5</b>
<b>Labor costs</b>			
Labour		4,500.0	3,300.0
<b>Income (After Labor Costs)</b>		<b>368,280.0</b>	<b>740,152.5</b>

Income Before Labor: IRR = None, NPV = 2,803,026.64

Income After Labor: IRR = None, NPV = 2,812,101.05

Eritrea			
Post Crisis Rural Recovery and De			
Beans Crop Model			
<b>YIELDS AND INPUTS</b>		<b>Jan. -- Dec.</b>	
(Per ha)		<b>Existing</b>	<b>New</b>
		<b>Technology</b>	<b>Technology</b>
		<b>1 to 21</b>	<b>1 to 21</b>
<b>Unit</b>			
Yields	kg	1,500	3,000
<b>Operating</b>			
<b>Inputs</b>			
Improved Seed	kg	-	102
Un-improved Seed	kg	102	-
Tractor Services	Hour	5	12
UREA	kg	-	50
DAP	kg	-	100
<b>Labor</b>			
Labour	day	300	220

## Attachment 2: Unit Prices

Eritrea

Post Crisis Rural Recovery and Development Programme

### FINANCIAL PRICES

(In ERN)

	Unit	Jan. -- Dec. 1999 to 2019
<b>Outputs</b>		
Honey	kg	180
Eggs	No	3.5
Milk	Liter	20
Sorghum	kg	9.45
Chick Pea	kg	25
Maize	kg	9.71
Pearl Millet	kg	9.71
Finger Millet	kg	9.71
Barley	kg	10
Beans	kg	250
<b>Inputs</b>		
UREA	kg	12.45
DAP	kg	10.05
Attrazine	Liter	499.5
2-4D	Litre	240
Fungicides	Liter	499.5
Thiram	Litre	499.5
Tractor Services	Hour	240
Processing	Ls	3,120
Improved Sorghum Seed	kg	15.45
Un Improved Sorghum Seed	kg	7.7
Improved Maize Seed	kg	22.35
Un-Improved Maize Seed	kg	11.2
Improved Fingure Millet Seed	kg	10.05
Un-improved Fingure Millet Seed	kg	5.025
Improved Barlet Seed	kg	23.85
Unimproved Barley Seed	kg	11.9
Improved Wheat Seed	kg	23.85
Unimproved-Wheat Seed	kg	11.9
Improved Chick Pea Seed	kg	19.95
Unimproved Chick Pea Seed	kg	10
Improved Pearl Millet Seed	kg	10.5
Unimproved Pearl Millet Seed	kg	5.25
Improved Seed	kg	20
Un-improved Seed	kg	10
<b>Labor</b>		
Labour	day	15

### Attachment 3: Farm Models

#### Sorghum and Millet Farm Model

Eritrea  
Post Crisis Rural Recovery and Development Program  
Sorghum and Millet Farm Model  
**FINANCIAL BUDGET (AGGREGATED)**  
(In ERN)

	Jan. -- Dec.						
	Without Project		With Project			Increments	
	1 to 20	21	1	2 to 20	21	1	2 to 20
<b>Main Production</b>							
Sorghum	4,725.0	4,725.0	11,340.0	11,340.0	11,340.0	6,615.0	6,615.0
Pearl Millet	2,427.5	2,427.5	8,739.0	8,739.0	8,739.0	6,311.5	6,311.5
<b>Sub-total Main Production</b>	<b>7,152.5</b>	<b>7,152.5</b>	<b>20,079.0</b>	<b>20,079.0</b>	<b>20,079.0</b>	<b>12,926.5</b>	<b>12,926.5</b>
<b>Production Cost</b>							
<b>Purchased Inputs</b>							
UREA	-	-	933.8	933.8	933.8	933.8	933.8
DAP	-	-	1,507.5	1,507.5	1,507.5	1,507.5	1,507.5
Tractor Services	1,800.0	1,800.0	3,840.0	3,840.0	3,840.0	2,040.0	2,040.0
Improved Sorghum Seed	-	-	185.4	185.4	185.4	185.4	185.4
Un Improved Sorghum Seed	92.4	92.4	-	-	-	-92.4	-92.4
Improved Pearl Millet Seed	-	-	78.8	78.8	78.8	78.8	78.8
Unimproved Pearl Millet Seed	39.4	39.4	-	-	-	-39.4	-39.4
<b>Sub-Total Purchased Inputs</b>	<b>1,931.8</b>	<b>1,931.8</b>	<b>6,545.4</b>	<b>6,545.4</b>	<b>6,545.4</b>	<b>4,613.6</b>	<b>4,613.6</b>
<b>Hired Labor</b>							
Unskilled	6,750.0	6,750.0	4,950.0	4,950.0	4,950.0	-1,800.0	-1,800.0
<b>Sub-Total Production Cost</b>	<b>8,681.8</b>	<b>8,681.8</b>	<b>11,495.4</b>	<b>11,495.4</b>	<b>11,495.4</b>	<b>2,813.6</b>	<b>2,813.6</b>
<b>OUTFLOWS</b>	<b>8,681.8</b>	<b>8,681.8</b>	<b>11,495.4</b>	<b>11,495.4</b>	<b>11,495.4</b>	<b>2,813.6</b>	<b>2,813.6</b>
<b>Cash Flow Before Financing</b>	<b>-1,529.3</b>	<b>-1,529.3</b>	<b>8,583.6</b>	<b>8,583.6</b>	<b>8,583.6</b>	<b>10,112.9</b>	<b>10,112.9</b>

Eritrea  
Post Crisis Rural Recovery and Development Program  
Sorghum and Millet Farm Model  
**PRODUCTION AND INPUTS (Detailed)**  
(In Units)

	Unit	Jan. -- Dec.		
		Without Project	With Project	Increments
		1 to 21	1 to 21	1 to 21
<b>Main Production</b>				
Sorghum	kg	500	1,200	700
Pearl Millet	kg	250	900	650
<b>Operating</b>				
<b>Purchased Inputs</b>				
UREA	kg	-	75	75
DAP	kg	-	150	150
Tractor Services	Hour	7.5	16	8.5
Improved Sorghum Seed	kg	-	12	12
Un Improved Sorghum Seed	kg	12	-	-12
Improved Pearl Millet Seed	kg	-	7.5	7.5
Unimproved Pearl Millet Seed	kg	7.5	-	-7.5
<b>Labor</b>				
Labour	day	450	330	-120

## Sorghum, Finger Millet and Maize Farm Model

Eritrea

Post Crisis Rural Recovery and Development Program

Sorghum, millet and maize farm model Farm Model

### FINANCIAL BUDGET (DETAILED)

(In ERN)

	Jan. -- Dec.							
	Without Project		With Project			Increments		
	1 to 20	21	1	2 to 20	21	1	2 to 20	21
<b>Main Production</b>								
Sorghum	4,725.0	4,725.0	11,340.0	11,340.0	11,340.0	6,615.0	6,615.0	6,615.0
Maize	9,710.0	9,710.0	14,565.0	14,565.0	14,565.0	4,855.0	4,855.0	4,855.0
Pearl Millet	2,427.5	2,427.5	8,739.0	8,739.0	8,739.0	6,311.5	6,311.5	6,311.5
<b>Sub-total Main Production</b>	<b>16,862.5</b>	<b>16,862.5</b>	<b>34,644.0</b>	<b>34,644.0</b>	<b>34,644.0</b>	<b>17,781.5</b>	<b>17,781.5</b>	<b>17,781.5</b>
<b>Production Cost</b>								
<b>Purchased Inputs</b>								
UREA	-	-	1,245.0	1,245.0	1,245.0	1,245.0	1,245.0	1,245.0
DAP	-	-	2,010.0	2,010.0	2,010.0	2,010.0	2,010.0	2,010.0
Tractor Services	2,400.0	2,400.0	5,280.0	5,280.0	5,280.0	2,880.0	2,880.0	2,880.0
Improved Sorghum Seed	-	-	185.4	185.4	185.4	185.4	185.4	185.4
Un Improved Sorghum Seed	92.4	92.4	-	-	-	-92.4	-92.4	-92.4
Improved Maize Seed	-	-	335.3	335.3	335.3	335.3	335.3	335.3
Un-Improved Maize Seed	168.0	168.0	-	-	-	-168.0	-168.0	-168.0
Improved Pearl Millet Seed	-	-	78.8	78.8	78.8	78.8	78.8	78.8
Unimproved Pearl Millet Seed	39.4	39.4	-	-	-	-39.4	-39.4	-39.4
<b>Sub-Total Purchased Inputs</b>	<b>2,699.8</b>	<b>2,699.8</b>	<b>9,134.4</b>	<b>9,134.4</b>	<b>9,134.4</b>	<b>6,434.6</b>	<b>6,434.6</b>	<b>6,434.6</b>
<b>Hired Labor</b>								
Labour	9,000.0	9,000.0	6,600.0	6,600.0	6,600.0	-2,400.0	-2,400.0	-2,400.0
<b>Sub-Total Production Cost</b>	<b>11,699.8</b>	<b>11,699.8</b>	<b>15,734.4</b>	<b>15,734.4</b>	<b>15,734.4</b>	<b>4,034.6</b>	<b>4,034.6</b>	<b>4,034.6</b>
<b>OUTFLOWS</b>	<b>11,699.8</b>	<b>11,699.8</b>	<b>15,734.4</b>	<b>15,734.4</b>	<b>15,734.4</b>	<b>4,034.6</b>	<b>4,034.6</b>	<b>4,034.6</b>
<b>Cash Flow Before Financing</b>	<b>5,162.7</b>	<b>5,162.7</b>	<b>18,909.6</b>	<b>18,909.6</b>	<b>18,909.6</b>	<b>13,746.9</b>	<b>13,746.9</b>	<b>13,746.9</b>

Eritrea

Post Crisis Rural Recovery and Development Program

Sorghum, millet and maize farm model Farm Model

### PRODUCTION AND INPUTS (Detailed)

(In Units)

	Unit	Jan. -- Dec.		
		Without Project	With Project	Increments
		1 to 21	1 to 21	1 to 21
<b>Main Production</b>				
Sorghum	kg	500	1,200	700
Maize	kg	1,000	1,500	500
Pearl Millet	kg	250	900	650
<b>Operating</b>				
<b>Purchased Inputs</b>				
UREA	kg	-	100	100
DAP	kg	-	200	200
Tractor Services	Hour	10	22	12
Improved Sorghum Seed	kg	-	12	12
Un Improved Sorghum Seed	kg	12	-	-12
Improved Maize Seed	kg	-	15	15
Un-Improved Maize Seed	kg	15	-	-15
Improved Pearl Millet Seed	kg	-	7.5	7.5
Unimproved Pearl Millet Seed	kg	7.5	-	-7.5
<b>Labor</b>				
Labour	day	600	440	-160

## Barley, Sorghum and Maize Farm Model

Eritrea  
Post Crisis Rural Recovery and Development Program  
Barley, Sorghum and Maize Farm Model  
**FINANCIAL BUDGET (DETAILED)**  
(In ERN)

FINANCIAL BUDGET (DETAILED) (In ERN)		Jan. – Dec.							
		Without Project		With Project			Increments		
		1 to 20	21	1	2 to 20	21	1	2 to 20	21
Main Production									
Sorghum	2,362.5	2,362.5	5,670.0	5,670.0	5,670.0	3,307.5	3,307.5	3,307.5	
Maize	9,710.0	9,710.0	14,565.0	14,565.0	14,565.0	4,855.0	4,855.0	4,855.0	
Barley	4,750.0	4,750.0	11,875.0	11,875.0	11,875.0	7,125.0	7,125.0	7,125.0	
Sub-total Main Production		16,822.5	16,822.5	32,110.0	32,110.0	32,110.0	15,287.5	15,287.5	15,287.5
Production Cost									
Purchased Inputs									
UREA	-	-	933.8	933.8	933.8	933.8	933.8	933.8	
DAP	-	-	1,507.5	1,507.5	1,507.5	1,507.5	1,507.5	1,507.5	
Tractor Services	1,800.0	1,800.0	4,080.0	4,080.0	4,080.0	2,280.0	2,280.0	2,280.0	
Improved Sorghum Seed	-	-	92.7	92.7	92.7	92.7	92.7	92.7	
Un Improved Sorghum Seed	46.2	46.2	-	-	-	-46.2	-46.2	-46.2	
Improved Maize Seed	-	-	335.3	335.3	335.3	335.3	335.3	335.3	
Un-Improved Maize Seed	168.0	168.0	-	-	-	-168.0	-168.0	-168.0	
Improved Barlet Seed	-	-	1,216.4	1,216.4	1,216.4	1,216.4	1,216.4	1,216.4	
Unimproved Barley Seed	606.9	606.9	-	-	-	-606.9	-606.9	-606.9	
Sub-Total Purchased Inputs		2,621.1	2,621.1	8,165.6	8,165.6	8,165.6	5,544.5	5,544.5	5,544.5
Hired Labor									
Labour	6,750.0	6,750.0	4,950.0	4,950.0	4,950.0	-1,800.0	-1,800.0	-1,800.0	
Sub-Total Production Cost		9,371.1	9,371.1	13,115.6	13,115.6	13,115.6	3,744.5	3,744.5	3,744.5
OUTFLOWS		9,371.1	9,371.1	13,115.6	13,115.6	13,115.6	3,744.5	3,744.5	3,744.5
Cash Flow Before Financing		7,451.4	7,451.4	18,994.5	18,994.5	18,994.5	11,543.1	11,543.1	11,543.1

Eritrea  
Post Crisis Rural Recovery and Development  
Barley, Sorghum and Maize Farm Model  
**PRODUCTION AND INPUTS (Detailed)**  
(In Units)

	Unit	Jan. -- Dec.		
		Without Project	With Project	Increments
		1 to 21	1 to 21	1 to 21
<b>Main Production</b>				
Sorghum	kg	250	600	350
Maize	kg	1,000	1,500	500
Barley	kg	500	1,250	750
<b>Operating</b>				
<b>Purchased Inputs</b>				
UREA	kg	-	75	75
DAP	kg	-	150	150
Tractor Services	Hour	7.5	17	9.5
Improved Sorghum Seed	kg	-	6	6
Un Improved Sorghum Seed	kg	6	-	-6
Improved Maize Seed	kg	-	15	15
Un-Improved Maize Seed	kg	15	-	-15
Improved Barlet Seed	kg	-	51	51
Unimproved Barley Seed	kg	51	-	-51
<b>Labor</b>				
Labour	day	450	330	-120



## Sorghum, Maize, Finger Millet and Beans Farm Model

Eritrea

Post Crisis Rural Recovery and Development Program

Sorghum, Maize, Finger Millet and Beans Farm Farm

### FINANCIAL BUDGET (DETAILED)

(In ERN)

FINANCIAL BUDGET (DETAILED) (In ERN)			Jan. -- Dec.							
			Without Project		With Project			Increments		
			1 to 20	21	1	2 to 20	21	1	2 to 20	21
<b>Main Production</b>										
Sorghum	2,362.5	2,362.5	5,670.0	5,670.0	5,670.0	3,307.5	3,307.5	3,307.5		
Maize	9,710.0	9,710.0	14,565.0	14,565.0	14,565.0	4,855.0	4,855.0	4,855.0		
Finger Millet	2,427.5	2,427.5	5,826.0	5,826.0	5,826.0	3,398.5	3,398.5	3,398.5		
Beans	187,500.0	187,500.0	375,000.0	375,000.0	375,000.0	187,500.0	187,500.0	187,500.0		
<b>Sub-total Main Production</b>	<b>202,000.0</b>	<b>202,000.0</b>	<b>401,061.0</b>	<b>401,061.0</b>	<b>401,061.0</b>	<b>199,061.0</b>	<b>199,061.0</b>	<b>199,061.0</b>		
<b>Production Cost</b>										
<b>Purchased Inputs</b>										
UREA	-	-	1,245.0	1,245.0	1,245.0	1,245.0	1,245.0	1,245.0		
DAP	-	-	2,010.0	2,010.0	2,010.0	2,010.0	2,010.0	2,010.0		
Tractor Services	2,400.0	2,400.0	5,520.0	5,520.0	5,520.0	3,120.0	3,120.0	3,120.0		
Improved Sorghum Seed	-	-	92.7	92.7	92.7	92.7	92.7	92.7		
Un Improved Sorghum Seed	46.2	46.2	-	-	-	-46.2	-46.2	-46.2		
Improved Maize Seed	-	-	335.3	335.3	335.3	335.3	335.3	335.3		
Un-Improved Maize Seed	168.0	168.0	-	-	-	-168.0	-168.0	-168.0		
Improved Fingure Millet Seed	-	-	201.0	201.0	201.0	201.0	201.0	201.0		
Un-improved Fingure Millet Seed	100.5	100.5	-	-	-	-100.5	-100.5	-100.5		
Improved Seed	-	-	1,020.0	1,020.0	1,020.0	1,020.0	1,020.0	1,020.0		
Un-improved Seed	510.0	510.0	-	-	-	-510.0	-510.0	-510.0		
<b>Sub-Total Purchased Inputs</b>	<b>3,224.7</b>	<b>3,224.7</b>	<b>10,424.0</b>	<b>10,424.0</b>	<b>10,424.0</b>	<b>7,199.3</b>	<b>7,199.3</b>	<b>7,199.3</b>		
<b>Hired Labor</b>										
Labour	9,000.0	9,000.0	6,600.0	6,600.0	6,600.0	-2,400.0	-2,400.0	-2,400.0		
<b>Sub-Total Production Cost</b>	<b>12,224.7</b>	<b>12,224.7</b>	<b>17,024.0</b>	<b>17,024.0</b>	<b>17,024.0</b>	<b>4,799.3</b>	<b>4,799.3</b>	<b>4,799.3</b>		
<b>OUTFLOWS</b>										
	<b>12,224.7</b>	<b>12,224.7</b>	<b>17,024.0</b>	<b>17,024.0</b>	<b>17,024.0</b>	<b>4,799.3</b>	<b>4,799.3</b>	<b>4,799.3</b>		
<b>Cash Flow Before Financing</b>	<b>189,775.3</b>	<b>189,775.3</b>	<b>384,037.1</b>	<b>384,037.1</b>	<b>384,037.1</b>	<b>194,261.8</b>	<b>194,261.8</b>	<b>194,261.8</b>		

Eritrea

Post Crisis Rural Recovery and Development Program

Sorghum, Maize, Finger Millet and Beans Farm Farm

### PRODUCTION AND INPUTS (Detailed)

(In Units)

	Unit	Jan. -- Dec.		
		Without Project	With Project	Increments
		1 to 21	1 to 21	1 to 21
<b>Main Production</b>				
Sorghum	kg	250	600	350
Maize	kg	1,000	1,500	500
Finger Millet	kg	250	600	350
Beans	kg	750	1,500	750
<b>Operating</b>				
<b>Purchased Inputs</b>				
UREA	kg	-	100	100
DAP	kg	-	200	200
Tractor Services	Hour	10	23	13
Improved Sorghum Seed	kg	-	6	6
Un Improved Sorghum Seed	kg	6	-	-6
Improved Maize Seed	kg	-	15	15
Un-Improved Maize Seed	kg	15	-	-15
Improved Fingure Millet Seed	kg	-	20	20
Un-improved Fingure Millet Seed	kg	20	-	-20
Improved Seed	kg	-	51	51
Un-improved Seed	kg	51	-	-51
<b>Labor</b>				
Labour	day	600	440	-160

## IRRIGATION

### Basic Assumptions

- Allocation to households will be 0.15ha
- Target production intensity is 200% however during the programme period, only an intensity of 160% may be reached
- Models:
 

Debub	-	Potato	-	0.1ha
		Onion	-	0.1ha
		Pepper	-	0.05ha
		Tomato	-	0.05ha later in programme year
Gash Barka	-	Tomato	-	0.1ha
		Onion	-	0.1ha
		Pepper	-	0.05ha
		Others	-	0.05 later in programme year
- The set of inputs/outputs is as set out in Appendix 2
- The costs per ha for the four crops of focus are set-out below. The incomes by models are also set-out below.

### Production cost per ha

Items of Input	Unit	Quantity				Unit Price (USD)				Cost (USD)			
		Onion	Tomato	Pepper	Potato	Onion	Tomato	Pepper	Potato	Onion	Tomato	Pepper	Potato
Seed	kg	0.23	0.25	0.33	2,000.00	46.70	62.30	41.60	3.24	10.74	15.58	13.73	6,480.00
Ploughing	hr	10.00	10.00	10.00	6.00	16.00	16.00	16.00	16.00	160.00	160.00	160.00	96.00
DAP	kg	200.00	200.00	100.00	200.00	0.83	0.83	0.83	0.83	166.00	166.00	83.00	166.00
Urea	kg	100.00	100.00	50.00	100.00	0.67	0.67	0.67	0.67	67.00	67.00	33.50	67.00
Potash	kg	150.00	150.00	150.00	-	0.21	0.21	0.21	-	31.50	31.50	31.50	-
Insecticides	ltr	4.00	3.00	3.00	-	23.30	23.30	23.30	-	93.20	69.90	69.90	-
Dimethone	ltr	-	-	-	2.00	-	-	-	23.30	-	-	-	46.60
Drusho	ltr	-	-	-	1.00	-	-	-	23.30	-	-	-	23.30
Fungicide	kg	-	-	-	4.00	-	-	-	16.70	-	-	-	66.80
Mancozeb	kg	2.00	1.00	1.00	-	16.70	16.70	16.70	-	33.40	16.70	16.70	-
Maneb	kg	2.00	1.00	1.00	-	16.50	16.50	16.50	-	33.00	16.50	16.50	-
Spraying	ltr	208.00	208.00	208.00	208.00	1.20	1.20	1.20	1.20	249.60	249.60	249.60	249.60
Labour	md	150.00	160.00	160.00	3.30	3.30	3.30	3.30	960.00	495.00	528.00	528.00	3,168.00
<b>Total</b>		<b>826.23</b>	<b>833.25</b>	<b>683.33</b>	<b>2,524.30</b>	<b>125.41</b>	<b>141.01</b>	<b>120.31</b>	<b>1,045.24</b>	<b>1,339.44</b>	<b>1,320.78</b>	<b>1,202.43</b>	<b>10,363.30</b>

### Income Estimates

<b>Model 1</b>					
<b>Seed</b>	<b>Area (ha)</b>	<b>Cost (USD)</b>	<b>Production (tons)</b>	<b>Price/kg (ERN)</b>	<b>Revenue (ERN '000)</b>
Potato	0.1	1036.3	1.25	16	20
Onion	0.1	119.61	2	22	44
Pepper	0.05	60.1	0.75	34	25.5
		1216.01			89.5
					<b>(ERN)</b>
	Revenue				89,500.0
	Cost				18,240.0
	<b>Net income</b>				<b>71,260.0</b>
	Return per labour				648.3
<b>Model 2</b>					
<b>Seed</b>	<b>Area (ha)</b>	<b>Cost (USD)</b>	<b>Production (tons)</b>	<b>Price/kg (ERN)</b>	<b>Revenue (ERN '000)</b>
Tomato	0.1	132.1	2	18	36
Onion	0.1	119.61	2	22	44
Pepper	0.05	60.1	0.75	34	25.5
		311.81			105.5
					<b>(ERN)</b>
	Revenue				105,500
	Cost				4,677
	<b>Net income</b>				<b>100,823</b>
	Return per labour				2,635

## DAIRY UNIT

<u>Capital Investment</u>	\$	Life Expectancy		
	Yr.			
- Kraal for two Live Stock Unit.	1000	5	200	
- Breeding stock Purchase One in-calf.	1700	6	167	
- Installation Cost (LS)	50	1	50	
<b>Sub-total</b>	<b>3250</b>		<b>417</b>	

## Operating Cost

US\$

- Feed (grass / forage) – Live Stock Unit / yr 7.5kg /day x 365 = 2738kg @ \$0.5/kg	1,369.0
- Labour for maintenance 2hr/day 0.25 x 365 = 92 days @ 3.3	304.0
- Labour milking @ 1hr/ day 0.25 md x 180 = 23 @ 3.3	75.9
- Health Service (Lump Sum) = \$100/yr	100.0
- Material & Equipment LS - \$50	50.0
-Miscellaneous LS - \$50	50.0
<b>Sub-total</b>	<b>1,948.9</b>

**Total cost 2,365.9**

Output - Milk 6 x 180 x 2 Litres - 2160 Litres  
- Steer – 24 month old 250 kg 250 kg Live weight

**Gross Income** Milk: 2160 @ USD 1.33 / Litre. 2872.8.

Steer 1 @ \$200 200.

Total 3072.8.

Net Income USD707.8 (ERN10,617)

Return to Labour USD9.5 (ERN 142.5)

## BACKYARD POULTRY

- Stock - 5 hen + 2 cocks @ \$5/unit = 35
- Breeding unit (Capital) [brooding house and fenced yard] = 200
- 2nd Batch procurement of cock PY<sub>2</sub> 5 @ \$5 = 25

### Assumptions

- Initial stock 5 Hens + 2 cocks
- Production of eggs/bird/year = 50 eggs
- Wastage during breeding - 10 %
- Mortality 10%
- Flock unit will be increased to 20 hens and 7 cocks by PY2 through retention of pullets from production
- Cocks from own flock will not be retained but sold to avoid in-breeding. Cocks will be bought from the breeding centres.

### 2<sup>nd</sup> Year Output Estimate

- 20 hens + 7 cocks = 27
- Egg production 20 x 50 = 1000
- Loss during breeding 10% = 100
- Net egg = 900
- Consumption = 500
- Hatched eggs = 400
- Mortality 10% = 40
- Pullet/Chickens = 360
- Consumption = 100
- Balance for sale = 260

### Basic Input

- Grains (Maize / Sorghum ) 0.15 kg / bird
- Labour 2 hours / day
- Vaccination / drugs / year LS 0.5 USD / bird
- Price of pullet 5 USD
- Price of hen / cock –full adult 7.5 USD

## COST BENEFIT

### Running Cost

- Feed 0.15 kg / day for 27 adults/year ERN 10 / kg 1479 kg = 986 USD
- Feed 0.025 kg for chick / pullets 810 for 180 days at 0.66 = 3285 kg = 2405 USD
- Drug \$0.5/bird/yr = 419 USD
- Labour 2 hours / day = 92 days /year at 3.3 USD = 304 USD
- Miscellaneous = 50 USD

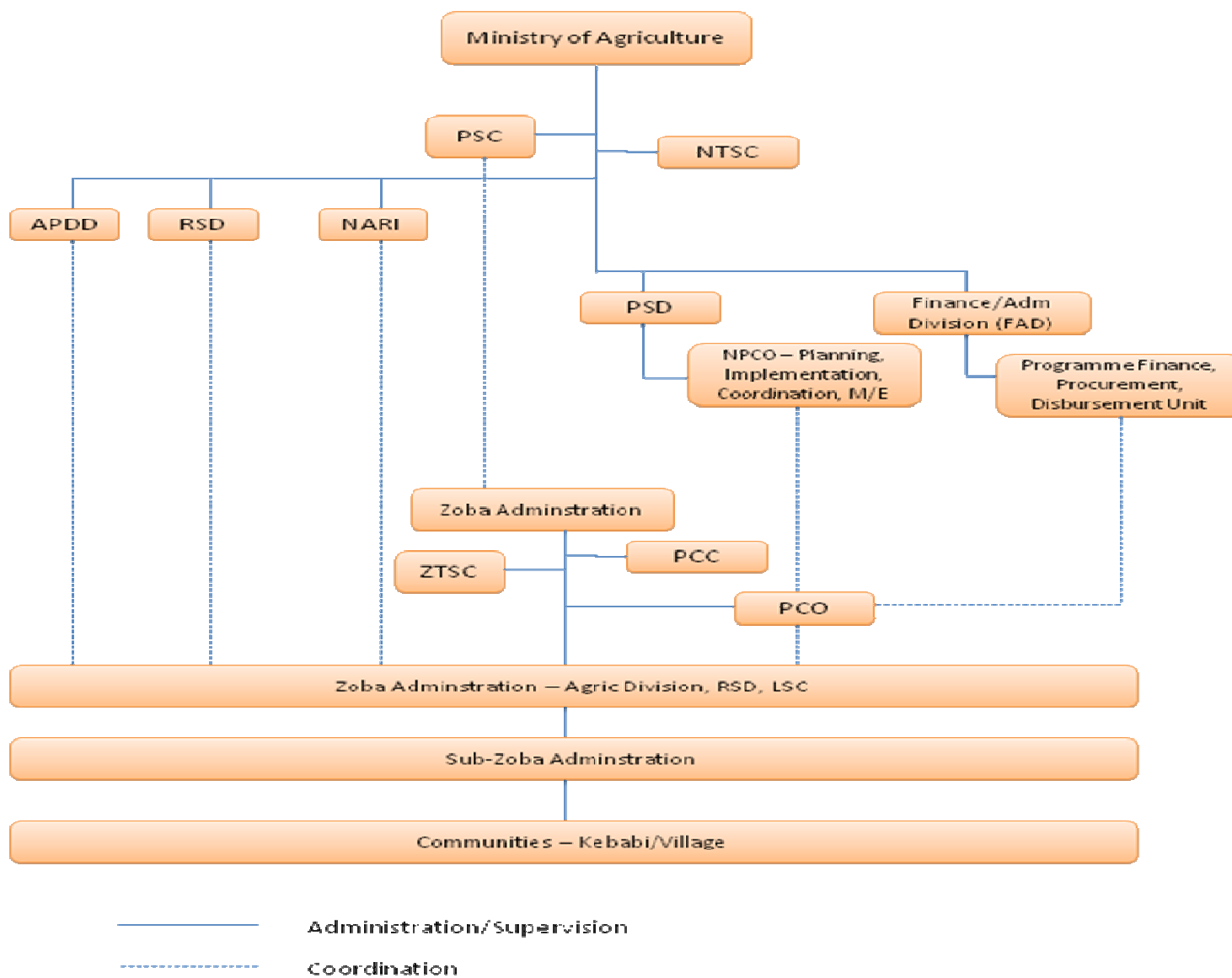
Total = 4164 USD

Revenue : Sale of 810 x 7.5 USD = USD 6,075  
Net Income USD 1,911

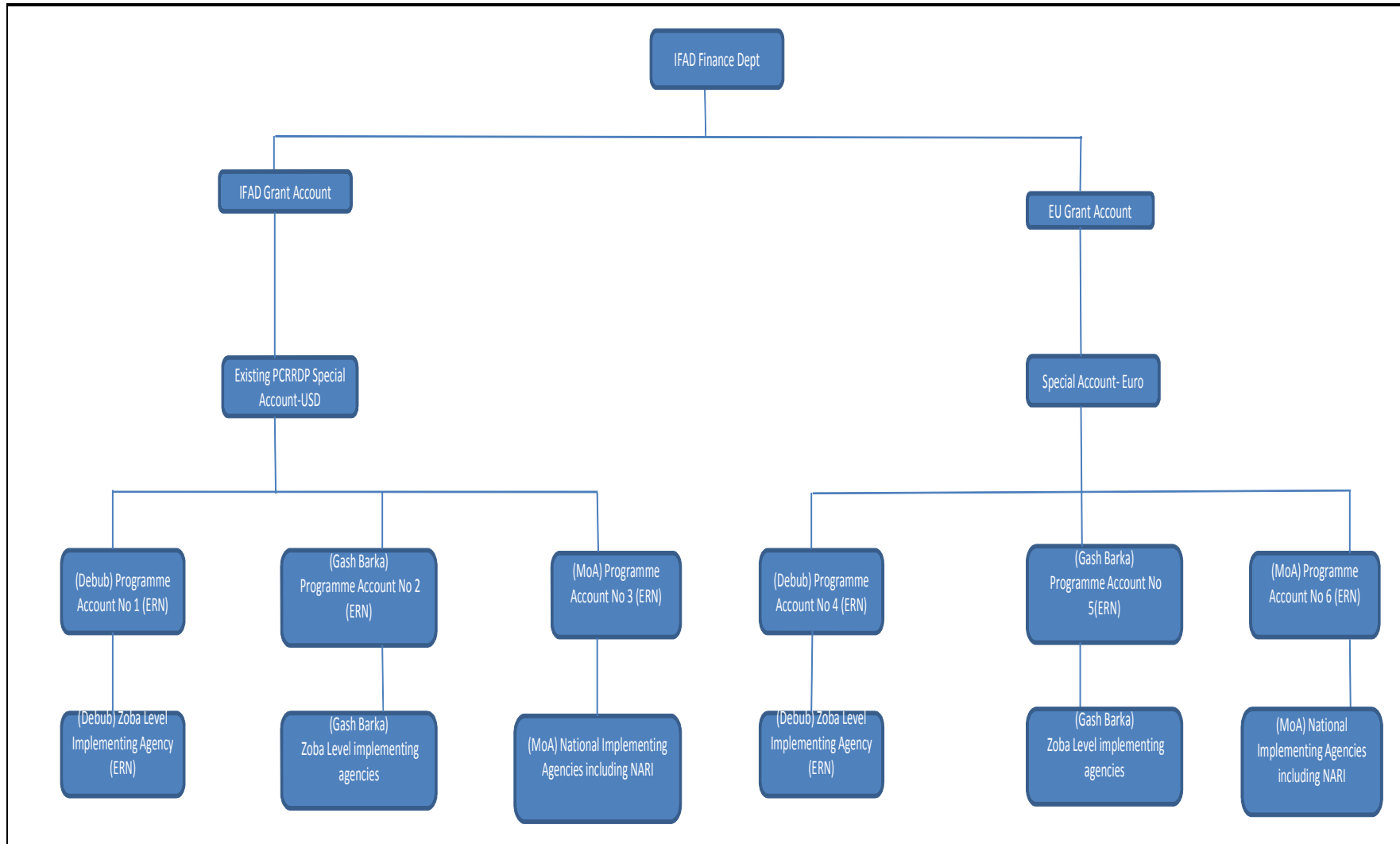
ERN28,665

Return to labour USD 24.1  
ERN361.5

CHART 1: PROGRAMME ORGANOGRAMME



**CHART 2: IFAD/EC/GOE FUND FLOW**



### CHART 3: PROGRAMME IMPLEMENTATION SCHEDULE

[illegible]



