

**OROMIYA REGIONAL STATE
OROMIYA BUREAU OF AGRICULTURAL DEVELOPMENT
FORESTRY DEPARTMENT**

**OROMIYA FORESTRY ACTION PROGRAMME
(OFAP)**

FIRST DRAFT

Volume II Programmes and Actions

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CHAPTER 1 LAND-USE ACTION PROGRAM

A. General Overview

The natural resources of Oromiya Region is the basis for the livelihood of the majority of the Region's population and development in general. To improve the standards of living of the people, increasing production from natural resources is required, and it is the major aim of rural development. Yet, over the last 20 years or so, the rural population have experienced increasing natural resources degradation.

At present rates of deforestation, estimated at about 100,000 hectares a year (I/ & Phase-II), Oromiya will have no high forest left within about 30 years from now. Already most of the smaller forest patches are disappearing. Dindin, Kubayo, Dire Garbich and forest around Guder areas are few examples to be counted, where forest has disappeared only in the last 10 years time.

The underlying causes of forest destruction are: expansion of crop and grazing lands, high demand for timber and firewood, expanding population and inefficient forest protection and management.

This is the root of the matter. Land use planning aims to provide support for decisions about the use of natural resources, environmental management and economic and social development. Without an appreciation of natural resources, decision-makers cannot specify the information they need or comprehend the choices to be made. Unless there is a recognized place for natural resources information in the process of decision-making, there will be no demand for this information and no way of using it.

With in the framework land use planning, the role of natural resources specialists should go beyond the mere collection of data. They need to be involved in the analysis of land use problems and opportunities; in specification of the data needed; in the analysis; generalization and interpretation of the data right up to the point of decision; in the monitoring and evaluation of land use plans; and in the continued maintenance of the natural resources database.

Change of land use also requires commitment, financial and human resource inputs, and a process or mechanism of change. Voluntary change of land use will come about only if the land users want it. Their commitment is given only if the new system or pattern of use is technically feasible, profitable, not too risky, socially acceptable, and preferred to what they are doing now.

Thus, in the procedure of land use planning, the change process, there has to be a platform for negotiation between all stakeholders if the inevitable conflicts of interest are to be resolved and a plan for change is to be given widespread acceptance. This platform must involve the participation of all interest group (land users, rural and urban people, government) and access to relevant natural resources information for all parties.

The Oromiya Forest areas fall under different property rights and forest management continuum from private on-farm forest at the one end through community forest to state forest at the other. This state of forest ownership can be viewed in terms of a series of circles radiating out from a core 'State Forestry' at the centre (see Figure 1, adapted from Von Tutor in CFWCP,FARM-Africa, 1994). Each circle depicts a particular set of property rights, management systems and forest conditions. As the circle expand outwards, there is a shift from state forest to private/on-farm forestry.

According to the circles, there will be different potentialities for development intervention of OFAP. The Package of likely project interventions and mode of operation will vary according to the sites position along the continuum. That means, rather than concentrate development activities within one circle of property rights and management systems, there is an arrangement for OFAP to cover the spectrum from 'State Forest, through Community Forest to Private/on-farm Forestry. What OFAP can do at each of the three categories may be somewhat different, but there is a logic in it that development interventions at all the three categories should follow the same trend .

The challenge is therefore, to formulate a system of management under different approaches that will minimize further destruction of the natural forests, balancing forest protection objectives with production interest of the regional government and local communities. As both the size of landholdings and soil fertility decrease, farmers are forced to either expand their fields into more marginal and fragile forest areas and look for non-farm income earning opportunities (mainly from forest) to supplement household income. To reverse the forest dependency of the rural communities, land use intensification is intended to increase the sustainable per unit area productivity of the land through improved land use and land husbandry practices. Without appropriate land use planning which include: crop diversification, intensive livestock management, use of organic farming, improved extension and training programmes and access to credit facilities; farmers will continue to extend the margins of their fields into the forest and mine the less

productive soils.

Therefore, each of the three circles offers opportunities for testing different approaches and combinations of packages based on varying forest/tree coverage, farming systems and the population densities and the carrying capacity of the land under each circle.

B. Goals and Objectives

(i) Goals

The overall programme goal is to improve forest conservation, through adaptation of participatory land use planning, without affecting the basic (food) needs of the present and future generation in terms of quantity and quality and the demand of other agricultural products needed for various sectors.

(ii) Specific Objectives

The objective is to explore and introduce different ways to intensify land use systems, in order to improve natural resources management, in particular forest conservation, in the long term.

To achieve the above objectives, the following key interventions are required:

- Provide security of land tenure for land users, to enable land users to invest on natural resources conservation and encourage sustainable production.
- Implement participatory land use plans, for the different conditions found in Oromiya Region.
- Increase agricultural productivity through the introduction of crop diversification and intensification and improved livestock management
- Expand rural credit facilities and encourage rural communities' savings
- Extend and promote conservation based training programmes for both government staff and farmers
- Strengthen awareness of the communities towards natural resources conservation and development.

(iii) Role and Importance of the Sub Sector in the regional context

The major objective of the land use-planning component in the OFAP approach is to seek ways and means of land use options for sustainable production. This can be achieved through a multitude of interventions including the promotion of diversification of crop and livestock husbandry systems, introduction of energy saving technologies, organic farming methods, expansion of on-farm forage and tree species.

Through appropriate land use planning and management, it is assumed that yield per unit area of land will increase. In addition, one of the general income effects of the interventions are the benefits accruing to the rural population through the anticipated net increase of farm income from crop intensification, diversification and improved livestock management.

On the other hand, the programme is essentially aimed at promoting ecologically sound agricultural interventions. Thus, land use planning is one of the main components of the programme which will have a direct impact on the natural resources, environment, promotion of organic recycling techniques in crop production, farm forestry and livestock management.

In this respect, the programme should give due recognition to the pivotal role of the component for the enhancement of sustainable production. In particular, in view of the high cost of the major yield enhancement technologies and the negative environmental effects of some of the production inputs like chemical fertilizer, the promotion of indigenous soil conservation methods based on participatory land use plans are vital.

(iv) Criteria and Guidelines for Rational Land Use

Natural resources degradation is caused as a result of the incorrect use of land, which fails to protect it adequately from over exploitation. Often this is a result of short-term exploitation without due regard for sustainable productivity. Legislation relating to land use must be related to an agreed land policy and

regarded as one of the important criteria's for carrying out such a policy. Adequate legislation may include the following:

- A clear statement of policy and purposes to explain need for, and anticipated benefits from the legislation.
- The establishment of properties and guidelines in-relation to agriculture, urban development, industrial development, and other uses aimed at preventing conflicting policies.
- The power to declare protected zones/areas in which allowable activities are defined, and the right to control and prevent waste, over-exploitation or misuse.
- The creation of institutions and authorities, responsible for land resources policy-making and implementation at any required level, and their coordination with institutions and authorities concerned with sectoral aspects such as agriculture, water, Forestry, urban development, industrial development etc.
- Careful coordination and appropriate interconnection between different legal enactment directly or indirectly affecting land and soils. E.g. Land ownership, Land re-allocation, Settlement, mining, Urban development, etc.
- Adequate powers of implementation and enforcement.
- The legislation should also cover provisions of financial contributions or subsidies, credit facilities, and the development of fiscal policy, which through taxation or tax exemption services, to implement the legislation.
- Above all, the legislation must be understood by those it affects and designed to reach all sectors of the community to make it successful.

The guiding principles should include the following three groups of technical elements:

1. Those relating to natural resources cover inventory, soil assessment and land use/land cover recording.
2. Those relating to protecting land degradation and from alienation from non-rural use.
3. Those relating to soil management (including appropriate farming systems), soil improvement and soil reclamation.

The above three groups of technical aspects can further be sub divided as following:

- a) Soil mapping, classification and assessment, and land-use recording. These aspects include:
 - Adoptive of agreed systems of land evaluation, soil classification by incorporating International and locally established systems.
 - Adoption of land evaluation and land capability classification, which draw Attention to conservation needs and sustainable utilization of land according to its capability.
 - Recording and monitoring of land use and farming systems.
- b) Protection of land degradation and encroachment to marginal and fragile areas. Technical aspects of the protection of land degradation include:
 - Research on soil erosion and measures for its control, including improved farming systems.
 - Monitoring of soil/land degradation
 - Carry out technical measures designed to control degradation.
 - Protection of agricultural land from alienation of or non-rural purposes.
- c) Soil improvement technical aspects, which include:
 - Improvement of soil physical and chemical properties by adoption of appropriate farming systems.
 - Introduction of organic recycling farming methods
 - Improve irrigation and drainage systems
 - Rehabilitation of soil and land which have been disturbed or degraded.
 - Reclamation of land not at present productive.

C. Strategies for Planning and Implementation

The regional policy of land use should allow and stimulate maximum utilization of the land on sustainable basis without lowering its productivity, and without causing direct or indirect damage to the environment.

The strategies are to:

1. Assess available land resources in terms of quality, quantity and liability to degradation.
2. Improve the productivity of soils by applying scientific knowledge and better management techniques which assures the use of soil on sustainable basis.
3. Improve the quality of available agricultural land through feasible means, such as irrigation, flood control and reclamation.
4. Slow down the loss of productive agricultural and forest land to other purposes.
5. Monitor changes in soil quality and quantity and the way land is used.
6. Bring to the attention of all concerned the dangers and adverse consequences of land degradation, and the need for conservation and appropriate legislation.
7. Improve the regional institutions to carry out the above objectives.

D. Development Options and Action Plans

As stated in the OFAP objectives, the Oromiya Regional government is committed to developing suitable strategies which match conservation of natural resources on one hand, and poverty alleviation on the other. So far, various development interventions have been made by the regional government to support natural resources conservation, which can be incorporated in the formulation and implementation of the strategies for sustainable land use component of OFAP.

In addition to the ongoing programme of the region in the areas of natural resources conservation; a variety of development options and activities are planned, in order to meet the objectives of OFAP as following.

(i) Developing Land Tenure Policy

The existing land tenure policy does not encourage the land users to invest on conservation of natural resources. Simply the policy does not guarantee long term investment, and as a result farmers are not willing to invest in their farm land since they are not sure of getting long term benefits.

In the interest of an equitable distribution of land, adjustments have to be made, on the size of holdings which are constantly at risk of redistribution. Therefore, socially and economically viable land tenure policy should be in place, which should guarantee sense of ownership and encourage long term investment on land.

(ii) Develop Land Use Policy

Issuing land tenure policy that assures land ownership by itself alone is not sufficient. The land tenure systems, before and post land reform proclamation of 1975, did not constitute land use policy. Land holders have free access of using the land without considering the suitability and capability of the land allocated to them. Thus, often marginal and fragile land areas have been cultivated and over-grazed and steep slopes covered by natural vegetation have been cleared, and put under different use which aggravated land degradation.

To rectify the past mistakes and strictly introduce rational land use systems, land use policy should be in place. The land users should know that they have to protect the land they are using, and rationally use it on sustainable basis, have to be committed to conserve the resource for the generations to come. Although the land use policy can be considered as interalia to the land tenure policy, the understanding should be that land use policy can be revised at intervals based on the situation of land degradation processes; while land tenure policy is a long term standing document.

(iii) Capacity Building and Institutional Strengthening

To implement and enforce both land tenure and land use policies, a separate body has to be established in the regional government organogram. Currently, no regional government organization, including the Bureau of Agriculture has the mandate to administrate land. Land as a major economic factor should not continue under such portfolio.

A well structured institution, both in manpower and finance, should be established to administer land. Training programme of short term and long term has to be organized for land administration staff.

(iv) Implementing Participatory Land Use Plans

To implement participatory land use planning, baseline data and maps are very important. There are ample existing data available from the studies conducted in the past by various organizations.

Primarily these necessary baseline data have to be collected and be placed at a centre (Land Administration Office) for reference and planning purposes.

Since many changes are taking place over years in land use practices, new Aerial survey has to be made to inventorize the current land use cover of the region. With the help of new Aerial photographs, participatory problems identification and land use options planning can be carried out together with farmers.

(v) Implementation of Integrated Development Options

Sustainable land use can only be achieved through integrated development options, which include ecological, economic and social aspects of development interventions. This basically refers to the successful management of resources to satisfy changing human needs, while maintaining and enhancing the quality of the environment and conserving natural resources.

The development options include:

i) Sustainable Land Use Planning

Implementation of participatory land use plans, which are *technically acceptable, ecologically sound, economically viable and socially just*. Gender aspects have to be also incorporated.

ii) Improve Crop Husbandry

The major cause for on-going forest destruction and land degradation is the expansion of annual crop land into forest and marginal areas. The extensive nature of the farming system is partly as a result of the relatively low productivity of the crops grown and poor soil fertility. To reduce the risk of further expansion, intensification and diversification of cropping system have to be improve and considered as major interventions in crop husbandry.

iii) Improve Livestock Husbandry

Livestock husbandry is one of the major sectors of rural economy.

However, the contribution of this major economic sector has been overlooked, and priority has been given to crop husbandry to the extent of cultivating most of the pasture areas and pushing grazing land to marginal areas causing over-grazing and aggravating land degradation. Therefore, livestock husbandry has to be promoted to improve production through improved pasture and range land development.

iv) Improve Infrastructure

Provisions for rural infrastructure is vital. Roads and other necessary facilities are required to achieve sustainable development of rural economy. To identify development problems, for the implementation of

planned activities, for monitoring & evaluation, and for market outlet purposes, access roads have to be improved or constructed.

(vii) Research and Dissemination of Results

Research and extension services have not been successful and seldom tried to tackle production problems of the subsistence farmers. Traditional farming systems are still unchanged. Thus, crop yields decrease from time-to-time, and soil fertility degradation increase on the other hand. Most research have been focusing on high potential areas, which do not correspond to marginal areas where most of the farmers are in need of support.

Thus, research should address the problems of the subsistent farmers, and the extension system should improve in the dissemination of information based on participatory approaches.

(viii) Monitoring and Evaluation

Monitoring and evaluation is a basic strategy for any development intervention. Information on the physical progress of the planned activities, inputs, outputs, achievements and constraints are important for feedback and possible modification of plans.

Development Options and Action Plans

Table 1

No	Interventions	Short Term 3-5 years	Medium Term 5-10 years	Long Term 10-15 yrs	Remarks
1.	Land Tenure Policy	x			
2.	Land Use Policy	x			
3.	Capacity building and institutional strengthening	x	x	x	
4.	Participatory Land Use Planning				
5.	Implementation of integrated development options:	x	x	x	
	a) Implement participatory land use planning				
	b) Improve crop husbandry	-	x	x	
	c) Improve livestock husbandry	-	x	x	
	d) Improve infrastructure				
	Training of farmers and staff in conservation based farming	-	x	x	
6.	Research and dissemination of results				
7.	Monitoring and Evaluation	x	x	x	
8.		x	x	x	

Cost Summary

Table---

ITEM	Programme Investment (Million Birr)			
	1 st Phase	2 nd Phase	3 rd Phase	Total
1. Land tenure policy development	1.08	-	-	1.08
2. Land use policy development	0.66	-	-	0.66
3. Capacity building and institutional strengthening	2.25	1.125	1.125	4.50
4. Land Use Planning:				
a) Aerial survey and mapping	20.00	10.00	-	30.00
b) Participatory land use options planning				
5. Implementation of integrated development options:	2.00	1.00	-	3.00
a) Implement participatory land use option plans				
b) Improve crop husbandry	-	4.00	3.50	7.50
c) Improve livestock husbandry	-	2.50	2.00	4.50
d) Improve infrastructure	-	10.00	6.40	16.40
6. Training of farmers and staff	10.00	10.00	9.20	29.20
7. Research and dissemination of results	1.15	1.00	1.00	3.15
8. Monitoring and Evaluation				
total	0.20	0.20	0.20	0.60
	<u>0.70</u>	<u>1.00</u>	<u>0.50</u>	<u>2.20</u>
	<u>38.04</u>	<u>40.825</u>	<u>23.925</u>	<u>102.79</u>

**FOREST CONSERVATION PROGRAMME
PROGRAMME PLANNING MATRIX**

Summary of Objectives/activities	Objectively verifiable indicators	Means of verification	Important assumptions
<u>Overall Programme Goal</u>			
Improved Conservation and development of Forest	<ul style="list-style-type: none"> • Rate of illegal deforestation reduced by 90% at state forests by end of 2015, and by 50% at community forests sites by end 2015. • Increase in biomass coverage by 15% in two state forests. • Increase in tree coverage by 50% both on-farm and in state forests by end 2015. • Government adopt JFM/PFM as part of National Forest Policy by 2015. 	<ul style="list-style-type: none"> • Projects Progress Reports • Regional/National statistics • Areal photographs • Project Study Reports 	<ul style="list-style-type: none"> • Government Forest policy remains sympathetic to participatory approach • Political stability assured.
<u>Component Project Purpose</u>			
Land Use Management Improved	By end 2015 production of main crops increased by 10% on sustainable basis for at least 50% of farmers in the region. By 2015 maintenance and/or improvement of soil fertility on 50% cultivate land, increase of 50% farm-trees and 15% increase regenerative woodland at around all forest sites.	Projects Progress Project Reports Signed Agreements Regional/Zonal Agricultural Departments Reports	Increases in agricultural production productivity will significantly reduce the pressure on state and communal forests. Land and trees tenure security are improved and maintained. Farm-inputs affordable. Farm gate prices provide sufficient incentive to producers.

<u>Summary of Objectives/Activities</u>	Objectively verifiable indicators	Means of verification	Important assumptions
<u>Overall Programme Goal</u>			
Improved conservation of forests			
<u>Component Project Purposes</u>			
Land Use intensified on a sustainable basis	<p>By end 06/98 production of main crops at Guder/Butajira/Lemen and Mitak increased by 10% on sustainable basis for at least 50% of farmers.</p> <p>By 06/98 maintenance and/or improvement of soil fertility on 20% cultivated land, increase of 40% of farm-trees and 15% increase regenerative woodland at all project sites.</p>	<p>Project quarterly and annual reports.</p> <p>Project studies reports.</p>	<p>Increases in agricultural productivity will significantly reduce the pressure on communal forests. Tenure security is maintained. Farm inputs available. Farm gate prices provide sufficient incentives to producers.</p>
<u>Component Project Results/Outputs</u>			

<ol style="list-style-type: none"> 1. Participatory land use plans implemented at selected demonstration sites. 2. On-farm organic re-cycling increased in out fields. 3. On-farm forage and trees increased. 4. Cropping system diversified. 5. Livestock production and management intensified. 6. Energy saving technologies adopted. 7. Small scale savings and credit system established. 8. Farmers, government and project staff trained. 9. Monitoring system established. 	<p>By end 06/98 farmers adopted improved land use options covering at least 10% of each site.</p> <p>By end 06/98 10% increase in numbers of farmers use of mulching, farmyard manure and organic matter and agro-forestry methods (crop residues, leaves) in crop production at Butajira/Guder/Mitak and Lemen sites.</p> <p>By end 06/98 at least 80% of farmers at all sites planting forage and tree species on-farm and survival rate at 60% in all sites.</p> <p>By end 06/98 range and variety of crops grown by at least 30% of farmers increased at all sites.</p> <ol style="list-style-type: none"> 1. By end 06/98 stall feeding of livestock adopted by 10% of farmers at each site. <ul style="list-style-type: none"> • Improved poultry adopted by 5% of women at all project sites by end 06/98. • 120 improved bee hive used by farmers at all sites by end 06/98. • 2 fish ponds established at Butajira and Guder sites by end 06/97. 2. At least 50 farmers use improved ploughs at 4 project sites by 06/98. <ul style="list-style-type: none"> • 30 animal drawn carts used by women's groups and 20 animal drawn carts by men's groups at 4 project sites by end 06/98. • Fuel saving stoves regularly used by 5% of households at the 4 sites by end 06/98. • 50 Enset processors used by women's groups at Butajira and Guder sites by end 06/98. 3. By end 06/96 X men and Y women and by 06/97 X men and Y women savings and credit groups formed at all sites. <ul style="list-style-type: none"> • By end 06/98 group savings constitute 20% of loan advanced. • By end 06/98 50% of farmers at project site receive small scale credit. 80% of credit repaid on time. • By end 12/97 200 contact farmers successfully trained 10 times in conservation based farming methods (soil conservation, crop husbandry, animal husbandry, new techniques) at 4 project sites. • By end 12/97 2 field days and 2 field visits by 100 farmers carried out at each site. • By end 1996 and 1997 25 women from all sites successfully trained each year in sewing, basketry and mat making. • By end 06/96 and 06/97 30 savings and credit group leaders from all sites successfully trained each year in bookkeeping and loan management. • By end 06/98 55 <u>woreda</u> and 15 zonal MoA staff from 4 sites successfully trained in participatory land use/land husbandry methods. 	<p>Land Use plan documents/maps</p> <p>Quarterly and annual project reports.</p> <p>Project studies reports.</p> <p>Government statistics.</p> <p>MoA and NRDEP reports.</p> <p>Training records</p> <p>Certificates</p> <p>MoA and NRDEP reports</p> <p>Assessment reports.</p>	<ul style="list-style-type: none"> • Farmers agree to the demonstrations on their plots. • NRDEP and MoA staff available and prepared to cooperate • Seed varieties available in sufficient quantities. • Climate remains within 'normal' range. • Government recognizes credit programme. • Communities agreed to realistic interest range charges. • Communities can control/minimize loan defaulters. • Suitable trainees found • Trained government staff stay in place.
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Activities	Objectively verifiable Indicators	Means/Sources of Verification	Important Assumptions
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	Total budget (in £):	Information from the accounts	
<ul style="list-style-type: none"> 1.1 Identify study and demonstration sites 1.2 Make agreement with the farmers in the sites for carrying out demonstrations. 1.3 Collect baseline information on soils, current land use, land holding and farming systems. 1.4 Carry out land suitability classification and develop land use options. 1.5 Produce land use/land husbandry plans in partnership with individuals and the community in the selected sites. 1.6 Implement land use options. 	<p>1995/6 1996/7 1997/8</p> <p>341304 306723 25308</p>		
<ul style="list-style-type: none"> 2.1 Maintain soil fertility by use of farm manure, composts, green manure, crop residues, forage legumes in crop rotation and various agro-forestry techniques. 2.2 Improve indigenous cultural soil conservation practices (contour cultivation, crop rotation, strip cropping, inter cropping, grass strips, windbreaks ...) 2.3 Implement structural soil conservation methods (soil bundling, stone terracing, gully controls, and run-off diversions ...) 			
<ul style="list-style-type: none"> 3.1 Maintain 8 community, 3 farmers groups and 1 school tree nurseries. 3.2 Establish additional 4 community, 7 farmer groups, 2 school and X number of individual tree nurseries. 3.3 Plant forage shrub and trees. 3.4 Maintain and establish private and community woodlots. 3.5 Establish women owned woodlot. 3.6 Improve the regeneration of indigenous forest and carry out enrichment plantations. 3.7 Carry out reclamation and rehabilitation of degraded land through grass and tree plantation. 			
<ul style="list-style-type: none"> 4.1 Diversify cropping system by introducing improved and new varieties of arable and tree crops along the improved production techniques. 4.2 Promote the use of organic manure and hand weeding techniques, while reducing dependency on chemical fertilizers and weed controls. 4.3 Reduce crops' pests and diseases. 4.4 Develop small irrigation schemes. 4.5 Conduct studies on land use/land husbandry techniques. 			
<ul style="list-style-type: none"> 5.1 Improve livestock feeds and feeding systems. 5.2 Reduce animals health problems. 5.3 Introduce improved animal breeds. 5.4 Improve poultry keeping methods. 5.5 Improve agriculture through the introduction of improved bee hive and honey extraction processes. 5.6 Introduce fish farming. 5.7 Improve livestock product qualities. 	<p>16</p>		

<p>7.1 Prepare guidelines for the administration of the savings and credit programme.</p> <p>7.2 Organize/Strengthen savings and credit associations and groups.</p> <p>7.3 Extend £50,000 over three years to credit groups.</p> <p>7.4 Carry out a study of the effectiveness of credit programme.</p> <p>8.1 Recruit new staff: 1 Agronomist/Horticulturist, 1 aerial photo - interpreter/data analyst, 4 site coordinator, 4 site guards, 1 driver and 1 secretary.</p> <p>8.2 Establish effective extension system.</p> <p>8.3 Train 200 contact farmers.</p> <p>8.4 Organise 2 farmers field days at each project sites.</p> <p>8.5 Organise 2 visits for at least 100 farmers from each sites.</p> <p>8.6 Train 25 women from each site, each year in sewing, basketry and mat making.</p> <p>8.7 Organise training for 60 savings and credit institution leaders in bookkeeping and loan management.</p> <p>8.8 Train 55 woreda and 15 zonal MoA staff in participatory land use/ conservation methods.</p> <p>8.9 Train 30 woreda and 15 zonal NRDEP staff in participatory land use/ conservation methods.</p> <p>8.10 Organise training to 10 experts of woreda departments of agriculture in savings mobilization and credit.</p> <p>8.11 Train 5 women affairs experts of MoA in gender and development.</p> <p>8.12 Train 2 MoA staff overseas for 3 months in forage and horticultural crops development.</p> <p>8.13 Train 1 MoA and 1 NRDEP staff for 1 year at MSc level in participatory methods and land use/land husbandry.</p> <p>8.14 Conduct 1 workshop on gender and environmental issues for 30 zonal and woreda MoA/NRDEP experts.</p> <p>8.15 Conduct 4 workshops on participatory land use/land husbandry / land tenure and improved technologies/extension methods for woreda and zonal government staff at each sites.</p> <p>8.16 Organise 1 workshop on rural credit for woreda and zonal MoA and local AIDB staff.</p> <p>8.17 Train 20 project field staff in land use/land husbandry, credit management and gender issues.</p> <p>8.18 Training of 1 project staff overseas in M&E/ data management for 3 months.</p> <p>Preparation of monitoring manual.</p> <p>Establish monitoring system.</p>			
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CHAPTER 2 FARM/AGROFORESTRY DEVELOPMENT PROGRAM

A. Objectives

Farm forestry/Agroforestry mainly as a private property farming practices has the following development objectives.

- Promotion of integrated tree production into a farming system for the production of fuel and constructions wood, fodder for farm animals and forage for bees and other indirect service through sound land management to increase total production through complementary production relation with arable or livestock production.
- Assessment of the existing major farm forestry/ agroforestry practices and reviewing current status as an input to an on going planning strategies is difficult due to:-
 - a) trees in arable or pasture are retained as a secondary or tertiary objectives least or no attention is paid. Since its is scattered all over with varous density it is difficult to monitor like wood lot or a plantation.
 - b) Since the product has a multiple use of both direct and indirect role and long term gestation period both qualitative and quantitative data are not available.
 - c) Unlike the crop production and byproduct utilization the emphasis that has been given for forestry development and conservation at all levels and through out this century in relations to the need however measured is minimal to nil.

It is in the faces of such difficult circumstance that the forestry action program in Ethiopia in general and that of Oromia region (which is 70-80% of the total national share) in particular is intended to be formulated. In depth planning can be made on specific field and spots of farm forestry and agroforestry where information is available, while an understanding should be made in lacking information on the program formulation to extrapolate information for the whole region. under such challenge an adjustment must be made after the initial program is underway (EFAP). Oromia's forestry action programe faces similar problem.

* Ethiopian Forestry Action Program, 1994 Volume III pp. 65-66.

B. Strategy

Farm forestry/Agroforestry an integrated farming system of multidisciplines in agriculture that combines livestock and crop forestry, the land, other environmental component and management strategies at technical level. The socio-economic, policy and institutional issues which is being reviewed need to be planned both from farmers felt need and environmental conservation based perspectives. The potential gap between research and extension is also one of the major syndrome in farm forestry and agroforestry development. The strategy should be addressed under the following major development components.

- Encourage viable traditional practices and duplicate this practices in potential areas for such practice.
- Encourage irrigation on rivers that drain to the sea and on those which dies in land use irrigated farm tree planting and salt tolerant trees or days rooted perennials of mixed planting of some sort of agroforestry.
- Establish a system that insure the farmers not only to use but to ow the land and trees the produce ones the entire gestation periods.

- Establish a gender balance use right in a participatory approach. This is an important component sine over 80% of the wood used as fuel wood is under entire responsibility on women shoulder. The concept of equality access to the production to, and benefit from need to be developed in the system.
- Tree production has initial cost and no return for the 1st several years there has to be subsidies and initial supply of seedlings and tax exemption has to be made at national level.

- Encourage and establish mixed cropping, of different arrangement. Such shift from mono to multicropping system intensify the production vertically and on the other hand include annual or short rotation crops and minimize risk of loss on initial return.

- Establish a monitoring system of assessing all other indirect benefit of trees to soil fertility build up, environmental conservation etc.

- Create awareness through training to bring about attitudinal change of an institutions working in collaboration with agroforestry fram forestry and the target beneficiaries.

**FARM FORESTRY/AGROFORESTRY
DEVELOPMENT PROGRAM AND ACTION**

Farm forestry/agroforestry is the most difficult sector that lacks information on success and failure in tree establishment. Trees on farm occupies the largest area in tree development and is scattered all over the places. There is no definite management system. Some are planted under the recommendation of foresters or extension agents, other are under farmers will and traditional knowledge.

Choice of the right species and management

In farm forestry exotic species like Eucalyptus globules and Eucalyptus camaldulensis are increasing dominating the entire landscape of Oromia.

On the other hand indigenous tree species are the most likely to survive and can often be established easily through natural regeneration (Bird et. al 1992).

On the contrary the current severe land degradation and environmental change put the success of indigenous trees under severe question. The problem has been further coupled with the limited knowledge the local foresters aquired in silviculture on native trees.

(i) Farm wood lot

In potential areas, the need for planting native trees are over looked. Since they can grow and develop naturally with out management they have poor forms for poles and construction on the other hands sustainability (coppicing ability in Eucalyptus) and short jestation period are another major chaacters for selection of these trees on farm. Eucalyptus globulos and Eucalyptus camaldulensis growth wood lot has be shown on table ___ for a

Summaried information and for detailed information see Appendix---- in different agroecologic zone is used for the program.

Table ___ farm wood lot

	HPC	LPC	HPP
Start up year	1	1	1
Tree spacing 1*1 m tree/ha	10000	10000	10000
Cost of seedling in Birr	0.25	0.25	0.25
Replanting %	10	10	10
Wood harvest starting year	5	7	4
MAI/ha at rotation m ³	40	20	50
Fuel wood Vol. At	100	70	100

Bird P.R, R.B Drickmon, K.N Cuming D.N. Jomett and G.A Kearey 1992 Trees and shrubs of south west victoria Technical Report series No. 205. Department of Food and Agriculture, Victoria Australia. PP 8.

rotation m ³ 50%			
Pole Vol. At rotation m ³ 50%	100	70	100

Source:- EFAP estimate (adjustment has been made under Oromia condition, most of the species for wood lot planting were assumed to be Eucalyptus under farmers spacing and management)

(ii) Block or non linear trees

Tree inter crop of indigenous sources are predominantly tree inter crop of *Acacia albida* (*Faidherbia albida*). Current existing number of tree inter-crop was estimated to be five at national level on EFAP document. The number in Oromia varies from 0 to over 100 trees per hectare. Mainly Oromia is the major *Acacia albida* tree inter crop region in Ethiopia. On proper *albida* tree inter crop farming an average of 10 trees/ha is the ideal figure that is found on farmers farm for the planning. The current stand is under stocked, this can be confirmed by research results. Research has been conducted on the use of trees in improving soil nutrient status (Kamara and Hague 1986) and yield study has been made on maize, sorghum, wheat and tef (Pochen 1986) and (Dechasa 1987 and 1995).

Fuel wood and feed production per tree has been determined. Optimum number of trees were 50 trees per hectare as proposed by EFAP. The program has been formulated based on these figure as shown in the following table.

(iii) Field Tree Planting

	HPC	LPC	HPP
Start up year	2	2	2
Current tree density/ha	10	10	10
Optimal tree density/ha	50	50	50
Trees/ha to be planted	40	40	40
Cost/seedling (in Br.)	0.25	0.25	0.25
Replanting (%)	50	50	50
Wood harvest starting year	7	10	5
Volume harvest per year	0.40m ³	0.30m ³	0.40 ³
Fuel wood (75%)	0.3m ³	0.23m ³	0.30m ³
Fodder (25%)	0.10m ³	0.08m ³	0.10m ³
Kg foder harvest per year	65	50	65
Crop yield increase in q.	7	10	5

There are several other major tree inter crop like Cordia african and Albezia in the west Croton in the north Acacia tortlis and Acacia senegal in the pasture land. Since there are no inforamtion on this trees planning the programme is difficult as this stage.

(iv) Boundary Planting

Boundary planting have several purposes. It is mainly for Boundary demarcation wind break and road side plantings. It is planted in a single line spacing which is almost twice as much as double or more spacing of line planting of tree. Complementary production relations are prefered for optimum resource utilization. Boundary planting are assumed to be shared equally with the neighboring farmers. Length of boundery planting in one hectare is assumed to be 100 m.

Source: EFAP (Ethiopian Foestry Action Programme Vol. III)
Pochen
Dechasa

Farm Boundary Planting

	HPC	LPC	HPP
Start-up year	3	3	3
Length of border planting/ha	100	100	100
Width of borders	4m	4m	4m
Rows of trees	2	2	2
Tree spacing	2m	2m	2m
Number of trees/ha	146	130	138
Loss of cultivable land	3.3%	3.3%	3.3%
Cost/seedling (in Br.)	25	25	25
Replanting	25%	25%	25%
Wood harvest starting year	5	5	3
Volume harvested per year	1.00m ³	0.50m ³	1.30m ³
Fuelwood 70%	0.70m ³	0.35m ³	0.91m ³
Poles 30%	0.30m ³	0.15m ³	0.39m ³
Fodder 0%	0	0	0

(v) Around house tree, fruit and non-wood plantings.

Around house planting is a live fence in general. Within the compound there are some vegetables and few fruit trees that are planted traditionally. In East and west Harargie fruit trees farming is common practice. While in Bale, Arsi and Shoa the practice does not exist. In the southern peoples region bordering Oromia fruit tree, coffee, enset and other root crops of multy storey mixed farming is predominantly exists. Except in Guji area multy storey fruit tree vegetable and root crop based farming seem a cultural barrier. This gap has to be bridged in the near future. Mixed planting forming multistory system on this small home stead garden is an effective technology to be applied. Assuming 8 x 8m square plot of 64m² in all potential zones on average. Some of the line plantings like Erythrina Brucei are pruned and used as fodder. Fodder trees and shrubs are planted in a compound. The outside row can be Gravelia, Eucalyptus or other trees. To reduce competition the inner row is planted in staggerd condition of shrub or secondary storey trees as fodder. Some for different fruit trees vegetables, enset, coffee in mixed farm will also be planted to sum up to 260 plants. Wood harvest startes at different years as showin on the table.

Around house

	HPC	LPC	HPP
Start-up year	1	1	1
Length of compound perimeter	64	64	64
Rows of trees	2	2	2
Tree spacing	0.50m	0.50m	0.50m
Tree inside compound	4	4	4
Number of trees/ha	260	260	260
Cost/seedling (in Br.)	25	25	25
Replanting	25%	25%	25%
Wood harvest starting year	5	6	3
Vegetable and fruit harvest per house hold (kg)	200	200	200
Volume harvested per year	2.0m ³	1.5m ³	3.0m ³
Kg fodder harvested/yr.	300	270	450

(vi) Wind break and shelter tree

Trees role as shade and shelter are indirect. There are different level of wind break density. Each can be implemented in the different level of wind control. The level of wind break can be a) block b) permeable c) porous. Generally block wind break is effective for vegetables or livestock shelter. For a crop land permeable wind break that controls 10 times the height of the tree need to be established. Permeable wind break compared to block one will minimize effect of swirl and accelerate around the end if the wind break length is longer than 12 times the tree height (Reid and Bird, 1990). Wind break in HPC zones would be 3

Reid R. and P.R Bird should and shelter In: Tree for Rural Australia (ed. K.W. Gremer) (SIRO Canberra PP. 319-335)

row of tree of multi story layer to insure uniform porosity on the entire height of the wind break 429 tree/ha is planted.

Windbreaks

	HPC	LPC
Start-up year	6	6
Windbreak spacing	70m	70m
Width of bands	4m	4m
Rows of trees/windbreak	3	3
Tree spacing inside windbreak	1m	1m
Number of trees/ha	429	143
Loss of cultivable land	5.7%	5.7%
Cost/seedling (in Br.)	0.25	0.25
Replanting	25%	25%
Wood harvest starting year	6	8
Volume harvested per year		
Fuelwood	60% 0.60m ³	0.30m ³
Poles	15% 0.15m ³	0.08m ³
Fodder	25% 0.25m ³	0.13m ³
Number of fodder trees	33% 141	71
Kg fodder harvester per year	150	75

C. Action and Investment

The detail action of specific technology by component are presented in Anex _____

(i) Land tenure

Land tenure security is a key factor that affects development of forestry program and has to be resolved. It is under this assumption that the proposed action program can be addressed.

(ii) Research and extension

This section is treated in the institution building chapter. Since agroforestry encompasses the crop and feed production in an integration portion of the activity need to be addressed by the agriculture extension services. As there will be several ones lacks, this is a subject for further refinement after the initial program started.

(iii) Summary Profile

Farm forestry/Agroforestry	Planning study:
The study covers traditional agroforestry investigation and review all agroecological zones and comparing with viable traditional agroforestry practices in the neighbouring regions of southers peoples. Study factors like socio-economic that hampred the adoption of this tecnology of multi-storey mixed fruit tree and home garden farming. This will be a major input to adopt the technology at farming system level. Identification and appropriate tree and fruit tree seed and planting material selection for own farm species testing. The project will be evaluated at the end of the project (end of two years). Implementing agency is Oromia agricultural office of the regional government.	

Seed in fruit tree seedling supply cost US 1.0 million

The project will start from _____ to _____ to supply tree, fruit and forage plantings of quality source. The ongoing National Tree Seed Project should open two new branch offices in Oromia to render the service to the region.

The production of seedling by the state and other institution support source is essential till farmers took over ultimately currently there are _____ number of nurseries operating with a compact of ____ seedling per year. The total seedling and cutting production for different technologies are shown in Appendix _____

To estimate this activity for a period of 1st 5 years the development program for the nurseries are summarized below.

Summary Profile

Nursery establishment and Development cost Us 10.0 million

Tree seeds and fruit cuttings are supplied in a period of 5 years. Three hundred to four hundred million seedling will produced per year. 400 million is attained at the end of 5 years. Gradually the nurseries will be taken ones by the farmers depending on the level of skills and capacity of the farmers in a given area. Private and community nurseries are of list cost and they can also be bare rooted ones. Technology of direct sowing should also be demonstrated side by side.

Nursery operation particularly pot filing, transplanting etc. is mostly done by women. The participant of gender balanced activity will also empower women in the tree development activity.

In the assumption that average farm size of Oromia in different zone is the same with the national. In 1994 per capita land holding is 1.834 ha for Oromia: The national farm size for HPC, LPC and (HPP) is 1.15, 1.13 and 1.41 respectively. The coresponding proportion for Oromia will be

Table—Average land holding in major potential area

Zone	<u>Landholding/person</u> (ha)	Landholding/household (ha)
HPC	1.72	8.6
LPC	1.70	8.5
HPP	2.11	10.5

It is on this assumption that the different land use and average farm size is based when population is 20 million. The land holding decreases over time with the population increase.

Summer profile on salinity

River bank, lowland arid saline tree planting cost 24 million Birr

Tree planting e.g. Acacia nilitica and other irrigated and rainfed tree species are important options 40 million seedling require 10 million Birr (even more if large pots are used) for seedling production 8 million Birr for management, 6 million Birr for other operational cost all in all 24 million Birr. The project. Starts on the 3rd year and planting will be completed in the 8th year irrigation channels are locally made one flat alluvial soils for flood irrigation with a minimum cost, priority are given on rivers that dies in Oromia on in the country as tree planting is optional both to reclaim saline waste land and permanent remedy to protect the problem. Any perennial fruit trees or fodder species are included in this programme. Any costs physical soil preparation will be avoided not to encour costs.

CHAPTER 3 FODDER PRODUCTION ACTION PROGRAMME

A. Hedgerow/Contour Fodder Tree Planting

In the highlands of Oromia, tree lucerne is planted at a closer spacing in a contour of 0.085 ha/family in the highlands. It will be planted with tree lucerne by one million family who adopt the technology. The cost per ha is 100 ETB from seed collection, seedling raising etc. The total cost will be 8.5 Million ETB. Since most of the shrubs are cut before flowering some has to be left for honey bee forage for flowering.

B. Indigenous Tree Protection

Important native trees has to be protected and rationally utilized, some of the fodder trees like *A. albida*, *Acacia totoralis* in a farm are pollarded, in a pasture in dry areas they are left for shade and pod production for cattle. The traditional technology has to be encouraged some 100,000 families has to protect 0.25 ha each in arid and semi-arid parts of Oromia pastural area. A total of 25,000 ha at the end of 15 years period will be reserved. For fencing, live fence like Euphorbia thorny branches of a tree from coppices can be used in rare cases. On average 1000 ETB/ha can be spent, which totals to 25 Million ETB that is required to carry out this activity.

CHAPTER 4 SOIL AND WATER CONSERVATION PROGRAMME

A. Objective

Application of soil and water conservation measures coupled with protection of the natural forests and woodlands and the promotion of tree planting will help minimise both on farm and off farm soil erosion, increase soil fertility and at the same time increase crop and livestock productivity on a sustainable basis. In view of the lessons learnt from past experience in soil and water conservation activities both at national and regional level, and the extent of current soil degradation problem in the soil and water conservation programme should focus on the following objectives

Minimise the rate of on farm and off farm soil erosion in the region.

Increase soil fertility level of cultivated lands so as productivity per unit area will increase on a sustainable basis and future clearings of forest lands for the sake of grazing and crop production minimised.

Minimise flood hazards to dams reservoirs and siltation of lakes in the region through control of run off.

Rehabilitate degraded lands in the region and gradually improve their productivity..

B. Strategy

In order to address the above mentioned objectives and bring about desirable changes in the overall protection of the natural resources of the region, the following strategies should be adopted.

Encourage tree planting on catchments and watershed areas to reduce off farm soil erosion through the voluntary participation of local people.

Establish incentive mechanisms to motivate farmers to apply effective soil and water conservation measures on their own farm lands.

Provide short term courses and in-service training in participatory methodologies and communication skills both for the technical staff and development agents at grass root level so that they are enabled to address the issue of implementation of soil and water conservation measures with farmers on participatory manner. Promote the wider use of indigenous soil and water conservation practices that are developed and used by the local farmers and improve their efficiencies where ever necessary through research and studies.

Promote forage production in homestead areas in the highlands and nearby water points in the lowlands so as to minimise soil degradation caused by the free grazing livestock population.

Encourage farmers to use manure and other organic matter for soil amelioration purposes rather than other uses for household energy supply.

Promote the use of agroforestry practices on farms.

Promote area closure of degraded lands based on the voluntary participation of the owners of these lands.

Encourage private investments to grow more trees especially on degraded lands with the provision of incentives such as tax exemptions etc.

C. Guiding Principles for Implementation.

The recommended action programme should consider the following guiding principles.

Implementation of the programme should be based on active participation of the local communities.

Participation in this context refers to the right to make decisions on the selection of conservation technologies , the time and space of application of this technologies and the use of the benefits accrued thereof.

Promotion and creation of awareness of use of biological conservation technologies should be given priorities while not disregarding the importance of the physical structures which are very important in reducing soil erosion especially from steep slopes.

Conservation methods should be ecologically effective i.e. Must insure sustainable resource management and at the same time should be economically effective because farmers are usually be willing to change their agricultural practices if significant immediate and secure increase in yield can be expected.

Soil and water conservation activities should be an integral part of the general agricultural practice. Soil conservation will often not be achieved as an isolated activity but only as part of the improved agricultural extension package that increase agricultural productivity and meeting the needs of the community.

D. Actions and Investments.

(i) Integration of Approaches

Identification of appropriate incentive packages to promote voluntary actions in application of on farm soil and water conservation measures by farmers.

In view of the foregoing discussions the need for improved conservation practice in order to protect the environment and improve the long term benefits of farming are very great. Farmers are in dilemma that while they are aware of the need, the productivity gains of conservation are such a long way off that there is little incentive to invest labour on extensive technologies. The basic rationale therefore for helping farmers to bridge the gap between immediate and long-term benefit is very important. There is a need therefore, to encourage farmers to share the costs of engaging in conservation of their own plots through establishment of incentive mechanisms. Special fund should be allocated to help identify appropriate incentive model.

On farm soil and water conservation measures by farmers.
Cost US \$ 1.5 million

This pilot project, to be implemented during 1999-2004, would identify appropriate model to promote voluntary actions by farmers in applying soil and water conservation measures on farm lands. Previous efforts in soil and water conservation programmes were constrained mainly by lack of incentive and genuine participation of farmers. Three watersheds representing the three main agroecological zones (HPC, HPP, and LPC) in the region will be selected to test the effectiveness of different incentive packages to motivate or encourage farmers voluntarily apply effective soil and water conservation measures on their farms. Possible incentive packages include provision of priorities for input supply and rural credit, subsidised input, compensation for tax, guaranty for land tenure security, provision of tools, seed etc. The project will supply/ facilitate provision of the necessary incentives to the farmers. Interested farmers will enter into agreement with the project. Incentive is given based on evaluation of performance. Successful results will be replicated to other similar areas. The project will support the training of DAs and SMS in participatory and communication methodologies. The project is implemented by the Zonal and Woreda Agricultural Development Offices.

(ii) Training in Participatory Methodologies and communication skills.

While there is a general agreement that rural development activities will not be successful without the active participation of the people, this approach is relatively new to the country. Most of the professionals and field agents who are at the forefront to promote development in the rural areas do not have sufficient background and experience in participatory methodologies. There is a need therefore to provide training to all professionals and field staff who are engaged in natural resources conservation and development activities in the region. The widely practised participatory methodology include the Rapid rural appraisal and Participatory Rural appraisal (RRA/PRA) methods. The Local Level Participatory Planning (LLPP) method is also a locally developed approach which can be further improved and widely used. In addition to the participatory approaches, appropriate communication skills are also essential factors to work with localfarmers. The training programme will focus on these areas.

Summary profile for project.

Participatory methodology Training
Cost US \$ 3 million

This project, to be implemented during 1999-2001, would bring attitudinal changes and at the same time improve the skills of the DAs and SMSs involved in promotion of natural resources conservation activities in adopting and implementing participatory methodologies. An efficient training team will be established at each zone within the Agricultural Development Department which is composed of at least three qualified trainers. One of the trainers should preferably be a female so that the gender aspect of the training is deliberately considered. The team provides the training to all respective Woreda technical staff involved in

extension and conservation activities. The trained Woreda staff will in return train the DAs and key farmers. The team at the Zonal level will always provide technical back stopping. The project would provide support for a technical assistance team of three trainers who would conduct 2 training of trainers 15 day course each for 36 participants. The trained staff will form the trainer team at Zone level and conduct training for DAs in all Woredas.

(iii) Research in indigenous Soil and Water Conservation Practices.

There is a wealth of locally developed soil and water conservation practices used by the farmers in the region. These practices are developed out of necessities and are well tested through generations of experiences. They are designed to address specific local problems and their application is limited in space and time. Some of them are very effective, which can be used readily while others may require improvements to increase their efficiencies. Despite their importance however, they were not give proper attention by experts. Given proper attention and improvements, they will be the best alternatives to solve the problems of soil and water conservation in the region. Studies will be made to identify the indigenous soil and water conservation methods, analyse their role in the context of local communities, systematise such knowledge and identify their potential and limitations. In order to do this, there is a need to build the capacity of the Regional Soil Conservation Research which is at the moment very much constrained in trained manpower and availability of fund.

Summary profiles for project.

Support to Soil and Water Conservation Research Capacity
Cost US \$ 3 million

The project, to be implemented during 1999-2003, would increase the quality and quantity of trained manpower working in Soil and Water Conservation Research Centres in the Region. It would also provide equipment and supplies to the centres. The project, therefore, includes provision of finance for long term and short term training of staff employed in the Research Centres already existing in the Region. It will also provide equipment and supplies to these centres. The project also provide technical assistance in improving the documentation and dissemination of information. The implementing agency will be the Regional Agricultural Research Department.

Research in traditional soil and water conservation methods.
Cost US \$ 3 million

This project, to be implemented during 2000-2005, would test effectiveness and adoption rate of the traditional soil conservation methods practised in the Region. The project would provide fund for the soil and water conservation research centres to undertake inventory of the existing traditional conservation practices, test the effectiveness of the different practice under different agroecological and farming system conditions and disseminate results. The implementing agency would be the Regional Agricultural Research Department.

(iv) promotion of private investment in tree planting in degraded areas.

There is grate interest among private investors to invest in tree planting provided there is suitable environment created for them; particularly if access to land is easily facilitated. There are a lot of degraded land all over the Region that can be suitable for tree planting. Availing this land to interested small investors would bring this lands covered with trees on the one hand and increases the general supply of fuel wood on the other. Both effects will reduce soil degradation by reducing surface run-off and releasing cow dung and crop residues to be used for fertilising the soil. The Regional government should thus aim at creating an environment that facilitates this kind of interventions by the private sector.

Summary profile for project.
Promotion of private investment in tree planting
Cost US \$ 0.5 million

This project, to be implemented during 1999-2001, would promote and facilitate the involvement of local private investors in planting trees in degraded areas. The project would provide financial support to the BoA and the Regional Investment Office to enable them conduct survey of degraded areas that are suitable for tree planting in all the zones and woredas in the Region and document results so that the information would be available for interested investors. The implementation agencies for this project will be the Regional Bureau of Agriculture and the Regional Investment Office.

(v) Promotion of backyard forage/fodder crop production by farmers.

Livestock imposes soil degradation because of shortage of feed supply. As long as farmers need to keep some animals, they have to feed them. In the absence of readily made supply of feed, farmers should be forced to let them go around and search for their feed. In due course they result in heavy damage to soil as described above. To avoid this conflicting situation and allow the coexistence of livestock within the farming system without damaging the environment, the OFAP should address the issue of livestock feed supply. Any attempt to improve communal grazing lands will be difficult because of utilisation and management constraints. Forage development therefore most likely to be successful if concentrated on individual holdings.

Summary profile for project
Backyard forage/fodder crop production
Cost US \$ 2 million

This project, to be implemented during 1999-2002, would increase forage supply at household level and thus reduce the pressure by grazing animals on farm lands and fragile areas. The project would be undertaken through extension work by the staff of BoA. The project includes procurement of forage seeds, training of farmers on the production and management of backyard forage/ fodder, and distribution of forage seeds. To initiate this project, existing forage seed multiplication centres would be reactivated and selected forage species multiplied. The project would be implemented by the Extension Department of the Regional Bureau of Agriculture.

(vi) Water harvesting

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Annex --- Soil Conservation Activities in Oromiya (1979/80-1990/91)

Activity	Unit	Shewa	Hararghe
Soil bund	Km	137,299	69,337
Stone bund	“	50,833	34,203
Fanya juu	“	20,916	1,760
Bench terrace	“	1,550	953
Bund maintenance	“	19,190	22,695
Cut-off drain	“	54	72
Water way	“	9	122
Access roads	“	4,868	3,155
Road maintenance	“	6,381	6,400
Hill side terrace	ha	44,809	65,021
Micro basin	No. (million)	1,163	684
Check-dam construction	meter	1,874,098	779,655
Check-dam maintenance	“	100,698	254,516
Seedling production	No. (million)	357	129
Tree planting	“	322	125.3
Grass seed production	Quintals	895	372
Bund planting	Km	3,866	8,573
Seed collection	Quintals	43,356	103,515
Earth dam construction	No.	11	4
Stream diversion	Km	520	21
Pond construction	No.	413	279
Spring development	No.	1,439	224

Annex---- Soil and water conservation activities implemented in the seven pilot watershed projects run by the RADB during the year 1996/97.

No	Activities	Unit	Planned	Achievement	%
1	Soil bund construction on crop land	Km	395.0	387.0	98.0
2	Soil bund maintenance	“	149.5	106.5	71.2
3	Stone bund construction	“	7.7	7.5	97.4
4	Stone bund maintenance	“	1.8	1.7	94.4
5	Fanyaa'juu bund construction	“	342.8	150.8	44.0
6	Fanyaa'juu bund maintenance	“	41.0	20.0	48.8
7	Level bund construction	“	35.4		
8	Level bund maintenance	“	8.0	0.2	2.5
9	Hill side terrace construction	“	10.0	120.0	1200.0
10	Hill side terrace maintenance	“	8.0	-	-
11	Waterway construction	“	56.5	37.1	65.7
12	waterway maintenance	“	13.3	4.2	31.6
13	Cut off drain construction	“	81.4	80.7	99.1
14	Cut off drain maintenance	“	15.5	19.5	125.8
15	Check dam construction	“	8.1	11.9	146.0
16	Feeder road construction	“	9.0	7.3	81.1
17	Feeder road maintenance	“	19.0	22.2	116.8
18	Micro basin construction	No	174000.0	51899.0	29.8
19	Nursery establishment	“	1.0	-	-
20	Nursery management	“	15.0	14.0	93.3
21	Tree seed collection	kg	258.7	242	93.5
22	Seedling production	ml	3.7	3.4	92.2
23	Pit preparation	ha	657.0	164.5	25.0
24	Seedling Plantation	“	656.0	159.5	24.3
25	Replanting	“	39.0	13.8	35.5
26	Weeding and cultivation	“	123.0	69.8	56.8
27	Grass seed multiplication centre	No	6.0	6.0	100.0
28	Grass strip	Km	629.0	172.5	27.4
29	alley cropping	“	22.4	65.9	294.6
30	Planting grass on bund	“	541.5	-	-
31	Grass seed collection	Kg	-	851.5	-
32	sowing grass seed on bund	“	100.7	100.3	99.6
33	Hedge row sowing	“	-	18.2	
34	Wood bridge construction	No	1.0	1.0	100.0
35	Area closure	Ha	38.0	36.0	94.7
36	Farmers training	No	171.0	63.0	36.8
37	Staff training	“	17.0	2.0	11.8
38	Planting grass on cut-off drain, bund	Km	1.5	1.5	100.0
39	Planting grass on waterways	“	2.0	2.0	100.0

CHAPTER 5 FOREST MANAGEMENT ACTION PROGRAM

A. Objectives and Principles

(i) Principles

The principles for the sustainable development and management of forest resources are outlined in the Federal Environmental Policy (issued in April 1997) and in the draft Forest Policy and Strategy prepared by the Ministry of Agriculture.

The policy on forest, woodland and tree resource aims at:

- recognising the complimentary roles of communities, private entrepreneurs and the state in forestry development;
- encouraging all concerned individuals and communities as well as the government to actively involve in the planning and implementation of forestry programmes to ensure sustainability, minimise cost, and forestal conflict;
- ensuring that forestry development strategies integrate the development, management and conservation of forest resources with those of land and water resources, energy resources, ecosystems and genetic resources, as well as with crop and livestock production;
- ensuring that afforestation with exotic species be restricted to backyard woodlots, to peri-urban plantations and to plantations for specific industrial and other projects; otherwise afforestation shall use local species as these are in tune with the environment and thus ensure its well-being;
- assisting the natural process of afforestation of uncultivable areas by controlling felling and grazing and by planting judiciously selected local species, as well as by other affordable interventions;
- adhering to the principle that sustainable forest management is achieved when social acceptability and economic viability have been achieved and the volume of wood harvested in a given period is about equal to the net growth that the forest is capable of generating;
- pursuing agricultural and other policies and programmes that will reduce pressure on the fragile woodland resources and ecosystems;
- promoting changes in agricultural and natural resources management systems which will limit the need for grazing of animals in protected forest areas;
- finding substitutes for construction and fuelwood whenever capabilities and other conditions allow, in order to reduce pressure on forests.

(ii) Objectives

- supply forest products (fuelwood, construction and industrial wood and fodder) on sustainable basis;
- protect and conserve the natural environment including genetic and wildlife resources;
- save foreign currency used for importing forest products;
- increase agricultural production by reducing soil erosion and maintaining soil fertility;
- promote the participation of rural people in forest development particularly women whose work load has increased due to deforestation and ensure their ownership right to forest resources.

The Forestry Conservation, Development and Utilisation Proclamation No. 94 of 1994 defines the principles that govern the management and conservation of forests, and provides specific mandates for Regional States. For instance, the proclamation:

- states that the appropriate regional body may designate any forest as protected forest;
- prohibits to cut any tree, utilise the products thereof or perform other activities in protected forests;
- makes it mandatory that the utilisation of forest resources is in accordance with management plans;
- allows inhabitants of forest areas to utilise forests (in accordance with the management plan and directive to be issued by the appropriate regional body) in an amount necessary to satisfy their ordinary domestic needs by paying appropriate fees;

- requires that tree cutting, settling, grazing, hunting, bee keeping or honey extraction should be permitted by the appropriate regional body;
- bans the utilisation or harvesting of *Hagenia abyssinnica*, *Cordia africana*, *Podocarpus falcatus* and *Juniperus procera*.

Against the preceding background, the overall strategies for forestry development are to:

- issue land use and forest policy and ensure the implementation of the same;
- put in place a strong and autonomous management structure for the forestry sector under the executive organ of the Regional State;
- allocate adequate resources and ensure their effective utilisation and productivity;
- build the institutional capacity of the forestry sector at Regional, zone and FPAs level;
- isolate the commercial functions and non-commercial functions of the forestry institution;
- promote the development and use of fuel efficient stoves and alternative energy sources where applicable;
- promote awareness raising (environmental education) in collaboration with government and non-government organisations;
- ensure the participation of the Oromo people, particularly women in the development and management of forest resources;
- set aside forests for protection (preventing soil erosion, protecting watersheds and conserving biodiversity) and productive purposes;
- recognise the value of traditional agroforestry systems and encourage the expansion of the same, and promote the adoption of improved and relevant technologies;
- co-ordinate forestry development efforts with relevant sectoral and cross-sectoral activities and initiatives.

It is, therefore, envisaged that the development and management of forest resources in Oromia will be guided by a combination of the preceding federal policy framework and the proposed strategies. It is also believed that if the policy framework and strategies are adopted and implemented well, they will address the issues and constraints in forest development and management identified in this, and the first phase report.

The objectives, strategies and actions proposed for the various types forests are outlined bellow.

B. Natural Forest Management

(i) Objectives

The objective of natural forest management shall be to protect, develop and sustainably use the remaining high forests of Oromia in and outside FPAs. The contribution of forests to soil and watershed protection, and to the conservation of biological diversity shall be increased. The forests will be managed to produce increased volume of industrial wood, fuelwood, fodder and minor forest products on a sustainable basis.

(ii) Strategies

The strategies for natural forest management are to:

- protect and develop Oromia's forest resources by concentrating efforts on the remaining Forest Priority Areas (FPAs);
- allocate 60 percent of the forests for protection and 40 percent for production;
- establish a non-commercial forestry sector which focus on research, training, extension, regulatory and protection functions;
- build the capacity of FWCDD to improve the management, pricing and utilisation of natural forests;

- improve forest harvesting techniques, and to introduce efficient timber conversion technology;
- encourage the participation of people in the management and development of forest resources through the implementation of a joint forest management (JFM) scheme on a pilot basis. The feasibility of such a scheme, in Oromia, can be first tried in and around forest patches outside FPAs. This will provide a cost effective means of generating information for concretely evaluating the relevance and benefits of JFM in the context of rural Oromia's socio-economic situation before the system is applied in FPAs.

(iii) Actions

- demarcate, gazette and inventory the FPAs;
- prepare management plans for FPAs, and strictly direct their development and management according to the same;
- establish natural forest reserves to protect watersheds, and to conserve biodiversity;
- provide training in forest demarcation, inventory, preparation of management plans, and harvesting techniques;
- in commercial enterprises, introduce appropriate forestry tools and equipment, and increase the efficiency of sawmills particularly their capacity to utilise harvests from thinnings;
- introduce appropriate forest valuation (goods and services), accounting (for regeneration and harvesting costs) and marketing system to maximise revenue from the sell of forest products;
- establish a resource and information centre to enhance the sector's capacity to provide consistent and reliable information to decision makers, investors, experts and the public;
- undertake awareness raising (environmental reduction) activities in collaboration with government and non-government organisations;
- in collaboration with the concerned administrative units, put in place a workable mechanism for enforcing existing legislation;
- issue a guideline for the management of natural forest patches outside FPAs;
- establish permanent sample plots in representative FPAs to generate information on the productivity of natural forests, and to determine appropriate management systems.

C. Woodlands and Bushlands

(i) Objective

The objectives shall be to protect and sustainably use woodland/bushland resources.

(ii) Strategies

The strategies are to:

- recognise the potential of woodlands and bushlands for supplying wood and woody biomass products as well as a variety of other benefits (fodder, browse, medicinal plants, food, etc.);
- put in place a mechanism for halting or significantly reducing the alarming deforestation rate of the *Acacia* woodland in the Rift Valley.
- put in place a mechanism for managing and sharing woodland and bushland resources between pastoralists and other users (on the basis of indigenous natural resource management systems) and for resolving disputes over property rights;
- ensure that the Woody Biomass Inventory and Strategic Planning Project (WBISPP) expands its area coverage to include woodlands/bushlands in Oromia;
- foster co-operation between local communities and the Regional State in the management and utilisation of woodland/bushland resources;
- encourage the protection, development and sustainable use of woodlands/bushlands in areas being heavily used by refugees.

(iii) Actions

- make use of the information generated by the Woody Biomass Inventory and Strategic Planning Project (WBISPP) to further study the extent and condition of woodland/ bushland resources;
- evaluate existing traditional woodland/bushland management systems;
- produce and distribute extension packages for improving woodland/bushland management;
- strengthen forest protection committees and pass a special decree for the protection of the *Acacia* woodland in collaboration with all stakeholders (local communities, tourism commission, tour operators, resort managers/owners, etc.);
- with the active participation of local communities, devise and implement alternative income generating schemes for those who solely depend on the sell of fuelwood and charcoal for their livelihood. In this case, possibilities for providing services (for instance renting camping grounds, selling drinks and providing information) to tourists can be considered with the proviso that a selected group of local people are trained to do the job;
- protect and develop woodlands/bushlands in co-operation with the relevant federal agencies, and with the United Nations High Commission for Refugees (UNHCR) Office in Addis Ababa.

D. Industrial and Peri-urban Plantations

(i) Objectives

The objectives of industrial and peri-urban plantations are to increase the supply of industrial wood, fuelwood and poles that corresponds to the region's demand, and to reduce the pressure on natural forests and woodlands/bushlands for such products.

(ii) Strategies

- encourage the expansion of plantation forests through State commercial enterprises and by encouraging private investment (including farmers) in tree planting;
- promote the planting of fast growing adopted ecotypes and indigenous trees;
- increase the supply of industrial wood to a level that corresponds to the demand of the wood processing industry;
- increase the supply of fuelwood and poles to urban centres and reduce the pressures on natural forests and woodlands/bushlands for such products;
- encourage the private sector to commercially produce fuelwood through the provision of incentives, and by making land available for tree planting near urban centres;
- increase the efficiency of producing wood from plantations through the application of appropriate management systems.

(iii) Actions

- assess the state of existing plantations and determine their economic value by conducting an inventory;
- rehabilitate forest plantations (which are believed to have potential high economic returns) through the application of tending operations (pruning and thinning), and salvage the available wood;
- establish buffer zone plantations around FPAs;
- concentrate efforts to encourage and support the expansion of tree planting in wood deficit areas;
- provide incentives (tax break, soft loan, access to land, security of land and tree tenure, etc.) to encourage the involvement of private investors in large scale tree planting schemes;
- organise the unemployed (youth and women) to establish peri-urban plantations for commercial purposes. They will have two advantages - creating job opportunities and increasing the supply of fuel and construction wood in urban centres.

E. Community Woodlots/Catchment Protection Plantations

(i) Objectives

The objectives of community woodlots/catchment protection plantations are to increase yields from farmers' woodlots, and to control soil erosion and run-off from steep hillsides which would also protect agricultural fields downstream.

(ii) Strategies

- encourage farmers to plant multi-purpose trees around their farms and in their homesteads to fulfil household requirements for fuelwood, fodder, construction and other benefits;
- promote mechanisms that would enable farmers to secure access to tree seedlings;
- control soil erosion and run-off from steep hillsides which would also protect agricultural fields downstream. The Region's five years development plan which aims at producing one billion tree seedlings to cover an area of 112,800 ha is expected to complement the protection of watersheds.

(iii) Actions

- provide training and extension services to farmers in tree planting and management of the same;
- make resources available to implement the five year development plan which aims at producing one billion tree seedlings and covering an area of 112,800 ha;
- make tree seedlings available for farmers;
- establish a collaborative working relationship with non-governmental organisations to implement the above plan;
- seek the active participation of women;
- prepare management plans;
- with the participation of local communities, specify a benefit sharing scheme;
- legally establish security of land use and rights to wood, fodder and other forest products;

F. Programme/Project Profiles

The following programme/project profiles are proposed for priority actions that will be immediately undertaken by the Region's forestry administration.

(i) Natural Forest Management

- Provide training in demarcation, inventory, and in the preparation of management plans
- Demarcate and inventory FPAs
- Prepare management plans
- Issue a guideline for the management of forests outside FPAs
- Establish permanent sample plots in representative FPAs
- Establish a resource and information centre
- Conduct awareness raising (environmental education) in collaboration with governmental and non-governmental organisations

Summary Programme/Project Profiles

Training

The project to be implemented in 1999 aims at training at least 20 members of staff in forest demarcation, inventory and the preparation of forest management plan. The trainees would be composed of first degree and diploma holders in forestry. Facilities and resource persons would be required from the Ministry of Agriculture, Wondo Genet College of Forestry, WBISPP and other relevant institutions. The training would last four months, and would focus on practical sessions to be built on the experiences of the WBISPP and the Natural Resources Management and Regulatory Department of the Ministry of Agriculture. A senior technical advisor would be employed to guide the practical training, and to provide advise in the preparation of forest management plans. A sociologists and an ecologist would also be hired on short term contract. Four wheel drive vehicles, camping and field equipment for the duration of the training, and beyond would be required. It is estimated that Birr 1.8 million would be required to implement the project. The Regional State would seek funding from domestic and external sources to ensure the successful implementation of the project.

Demarcation, Inventory and Preparation of Forest Management Plans

Demarcation, inventory and the preparation of forest management plans for the FPAs would be undertaken beginning in 1999. The activities would build on the experiences gained from the plans of Tiro-Boter Becho, Munessa-Shashemene and Belete-Gera. By mobilising and coordinating manpower and resources within the Region and the Ministry of Agriculture, and by making use of existing experiences, it is envisaged that three management plans would be prepared in a year. A team of 5-7 senior foresters equipped with computers would compile, analyse and prepare management plans on the basis of the field data gathered by a strong forest demarcation and inventory team who would also establish permanent sample plots in representative FPAs. The team would also be expected to prepare a guideline for the management of forests outside FPAs. In consultation with communities living in and around the forests and other stakeholders, the guideline would define ownership, mode of management and benefit sharing. The annual project budget is estimated at Birr 2.5 million.

Resource Centre and Awareness Raising

A resource and information centre would be organised to provide services to experts, researchers, educators and journalists who would other wise have no access to information on the Region's natural resources, and the environment. The available literature (published and unpublished) on the Region's natural resources would be gathered and classified for easy access. The centre would acquire books, journals, newsletters and other published materials through purchases, subscription, and networking with individuals and organisations at home and abroad. The centre would also be equipped with computers, copiers and desktop publishing facility that would be used to produce awareness raising materials. Two conservation education officers would be based at the centre to facilitate the production and dissemination of information, and to conduct awareness raising activities. The education officers would liaise with governmental and non-governmental organisations working in environmental education. The initial investment for establishing the centre is estimated at Birr 2.7 million, and the estimated annual investment during the decade (1999-2009) would be Birr 800,000.

(ii) Woodlands/Bushlands

- Assess the state of woodlands/bushlands
- Take measures to effectively protect the Acacia woodland in the Rift Valley
- Conserve woodlands in areas heavily used by refugees
- Provide extension services and disseminate information packages

Summary Programme/Project Profile

Assessment, protection, development and sustainable use of woodlands/bushlands

This project would focus on the conservation and sustainable use of woodlands/bushlands. In 1999, the status and productive capacity of woodlands would be assessed. Information from the on-going WBISPP would be incorporated. The study would include an evaluation of traditional resource management systems, and mechanisms for resolving conflict pertinent to the utilisation of natural resources. Between 2000 and 2010 emphasis will be given to the protection and rehabilitation of the Acacia woodland in the Rift Valley. A strong community-based Woodland Protection Committee would be established in each village. The committees would be supported by a small full time Monitoring Team recruited among members of the community. The team will receive training in best practice forest protection, which is sensitive to traditional access rights of local communities to woodland/bushland resources. A special arrangement would be made with UNHCR Country Office to put in place a mechanism for the protection, development and sustainable use of woodlands/bushlands in refugee settlement areas. Extension services and information packages would be provided to pastoralists. It is estimated that this venture would cost Birr 3.5 million in the first year, and thereafter, Birr 1.6 million per annum.

(iii) Industrial and Peri-urban Plantations

- Assess the state of existing plantations
- Rehabilitate potentially productive plantations
- Expand the area of plantations

Summary Programme Profile

Assessment, rehabilitation and expansion of Plantations

This programme to be implemented over the next 20 years beginning in 1999 would enable the Region's forestry administration to assess existing forest plantations in and outside FPAs, rehabilitate the same, identify land and expand the area of plantation to increase the supply of wood for fuel, construction, and for industrial use. The assessment would be carried out in the first year. Results of the assessment would provide reliable information on the extent and status of plantations, and would be instrumental in developing a plan for rehabilitating, and enhancing their management. The supply of wood would be expected to increase during the rehabilitation phase, for many of the plantations require thinning immediately. The Regional State would undertake tree planting activities, and would also encourage the development of private forestry through the provision of incentives. It is expected that at least 18,000 ha would be planted per year through combined public and private sector investments. This is a conservative estimate based on the constraints that would be encountered in securing land for establishing forest plantations. In 2017, the industrial plantations would be expected to produce 4.8 million m³ industrial and construction wood. The estimated cost over the next 20 years would be Birr 500 million from the Regional State, and Birr 200 million from the private sector.

(iv) Community Woodlots/Catchment Protection Plantations

- Provide training and extension services to communities in and around critically threatened catchments
- Make tree seedlings available to farmers
- Put in place a mechanism for benefit sharing with local communities

Summary Programme Profile

Community Participation in Forest Management

This programme would be implemented over a 20 year period, and would provide opportunities for establishing a mechanism for involving communities to be involved in establishing private woodlots around their farms and homesteads, and in undertaking a joint forest management venture in collaboration with the Regional States. The later would initially focus on natural forests outside FPAs and the development of catchment protection plantations. This would take the form of enrichment planting, area closure and the establishment of new plantations. Training and extension services as well as tree seedlings would be initially provided to farmers at nominal prices. A mechanism for benefit sharing from the joint forest management scheme would also be put in place. The estimated annual cost would be Birr 2.5 million.

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Annex

Vegetation Classification

Studies conducted on the vegetation of Ethiopia by FAO (1984), Cesen (1986), EMA (1988), SFCDD (1990), WCMC (1991)³, Mesfin (1992), WBISPP (1995), CSE (1996), EFAP (1994), have suggested classifications of many vegetation types. As yet, no single approach has been recognised and adopted.

Nevertheless, the vegetation classification adopted by CSE (1996) is widely referred. On the basis of physiognomy (outward appearance of vegetation) and structural features nine vegetation types are recognised by the Secretariat for the Conservation Strategy of Ethiopia.

As it can be observed from the description of each vegetation type presented in the current study, the physiognomic-structural classification is closely related to climatic factors especially altitude, temperature, and precipitation. Furthermore, WCMC (1991) has reported that the dominant factors responsible for the distribution of the main plant communities in Ethiopia are altitude and humidity.

Apparently, the vegetation classification adopted for Oromia is based on physiognomy and structural features, which in turn are related to environmental factors particularly altitude temperature and precipitation.

The following table shows the classifications used by different writers to describe forests and woody vegetation types in Ethiopia. It illustrates the difficulties which arise frequently when one attempts to adopt one of the approaches for a particular area.

Table 1.1 Vegetation Classifications Provided by Different Institutions and Individuals

FAO (19984)	Cesen (1986)	EMA (1988)
Forests	Forests	Afroalpine and Subafroalpine
Woodlands	Afroalpine Vegetation	High Forest
Bushlands	Woodlands	Woodlands
Shrublands	Xerophilous Woodland	Shrubland
Reverine Forests/Woodlands	Bushlands	Srubland and Bushland
	Shrublands	Grassland
	Riparian Vegetation	
	Grassland	
SFCDD (1990)	WCMC (1991)	J. de Vletter (1991)
High Closed Forests	Montane Dry Evergreen Forests	Steppe
Bamboo Woodland	Dry Forest of the Plateau	Savannah
Mixed Deciduous Woodlands	Dry Forest of Sidamo, Bale and Hararge	Woodland
Savannah Woodlands		Shrublands
Reverine Forests/Woodlands	Montane Rain Forest	Bushlands
	Humid mixed Forest	Moist Ever Green Lowland Forests
	Humid Broad Leaved Forest	Moist Evergreen Montane Forests
	Transitional Forest of the South-west Escarpment	Dry Evergreen Montane Forests

³ The World Conservation and Monitoring Centre (WCMC) has described the montane forests of Ethiopia following Friis (1986).

	Lowland Evergreen Forest	Reverine Forests
Mesfin Tadesse (1992)	WBISPP (1995)	CSE (1996)
Upland Dry Evergreen Forest of the Eastern Escarpment	Afroalpine and Subafroalpine	Desert and Semi-Desert Scrubland
Upland Dry Evergreen Forest of the Ethiopian Plateau	High Forest	Acacia-Commiphora (Small Leaved Deciduous) Woodland
The Evergreen Forests of Tigray, Gondar and Gojam	Woodland	Lowland Semi-Evergreen Forest
The Plateau in Wello	Bushland	Combritum-Terminalia (Broad Leaved Deciduous Woodland)
The Plateau in Shewa	Shrubland	Moist Evergreen Forest
Mixed Upland Evergreen Forests of Arsi, Gamo Gofa, Sidamo, Bale and Hararge	Grassland	Evergreen Scrub
Humid Upland Forest of West, Southwest and South Ethiopia		Dry Evergreen Forest and Montane Grassland
Transitional and Lowland Semi-Evergreen Forests of Southwest Ethiopia		Afro-alpine and Sub-afroalpine Vegetation
Riverine Forest		Riparian and Swamp Vegetation

A forest can be further classified into community types, which can be identified by one or two of the dominant and/or characteristic species. For instance, Tamrat (1993 and 1994) has described 18 community types in Jibat, Chilimo, and Menagesha-Suba forests (Table 1.2). The main differentiation between the community types appears to follow altitudinal gradient which ranges between 2,000 and 3,000 m.

Table 1.2 Forest Community Types

JIBAT	CHILIMO AND MENAGESHA-SUBA
<i>Arundinaria alpina</i>	<i>Juniperrus procera-Myrsine africana</i>
<i>Ilex miti-Rapanea simensis</i>	<i>Juniperus procera-Maytenus arbutifolia-Peucedanum-winkleri</i>
<i>Syzigium guineense-Psychotria orophila</i>	<i>Erica arboria-Myrica salicifolia</i>
<i>Olea hochstetteri-Olinia aequipetala</i>	<i>Spiniluma oxyacantha-Scolopia theifolia</i>
<i>Croton macrostachyus-Ficus sur</i>	<i>Scolopia theifolia-podocarpus gracilior</i>
<i>Olea welwitschii-Carissa edulis</i>	<i>Podocarpus gracilior-Olea europaea</i>
<i>Syzigium guineense-Vepris dainelli</i>	<i>Podocarpus gracilior-Allophylus abyssinicus</i>
<i>Erica arborea</i>	<i>Juniperus procera-Sideroxylon gillettii</i>
	<i>Podocarpus gracilior-Maytenus arbutifolia</i>
	<i>Euphorbia abovalifolia-Podocarpus gracilior</i>

CHAPTER 6 FOREST INDUSTRIES DEVELOPMENT PROGRAM

Constraints identified in the forest industries development sector and the analysis carried out indicated that the strategy to eliminate the constraints must consider the following future program of action. They concern both the industrial and the forest resources sector with the following broad objectives.

1. Objectives

(i) Long Term Objectives

- Satisfy the growing demand for industrial forest products such as sawn-wood, transmission pole, wood based panels and construction wood.
- Contribute to the growth of the local and regional economies and secure employment opportunities.
- Expand the forest-based industries to secure adequate capacity for processing the projected increased supplies of industrial wood from plantation and management of natural forest.

(ii) Short and Medium Term Objectives

- Study the capacity of the forest (natural and plantation forest) to supply forest-based industries and the possible use of mobile saw mills.
- Assessment and evaluation of the forest industries which require rehabilitation and renovation.
- Proposal development for the development of forest industries and industrial forest plantation for selected forest priority areas in the region.

In order to realize the objectives stated above, the following development strategies are proposed:

- Promote the utilization of lesser used abundant tree species as well as logging residues;
- Limit the over use of the existing limited forest resource and enforce the annual allowable cut;
- Put in place special incentive packages to act as catalysts for the development of wood processing industries. These incentives include exemption from custom duty, excise duty and sales tax on imported machinery and equipment;
- Transforming the forestry development sector into semi-autonomous industrial forest enterprise;
- Improve the skill of workers of forest industries through on-job training;
- Facilitate land acquisition to private investors to establish industrial plantations in order to ensure timber raw material supply to the forest based industries;
- The stumpage value paid for the logs should be raised to meet the cost of production for timber trees and frequent revision of value in order to contribute to the management of forest resources;
- Encourage the development of secondary wood-processing industries with a view towards achieving greater utilization of the resource base and generate greater value-added products;
- Improve the marketing and distribution system of forest products;
- Encourage the setting up of small scale rural based industries using log wastage and bamboo to enhance the socio-economic development of the rural people and the allocation of raw material to accommodate small wood working enterprises in the rural areas since they produce basic consumer goods for the low income groups;
- Promote the already existing open tendering system for the provision of raw material supply for forest based industries.

B. Future Program of Action

Preliminary Industrial Forest Survey (Both Plantation and Natural Forest)

The present information regarding the availability of raw material for the wood-based industries is unsatisfactory and therefore, investment should not be started before the forests have been inventoried and management plans for each development area developed.

Objectives:

- Assess the timber potential of the regional forest priority areas in order to study the capacity of the forests to supply forest industries.
- Estimate the potential of each area and prioritize these forests according to their potentials.
- Identify the type of saw mills required.

Strategies:-

- Conduct on the job training (short term) to up-grade the skill of workers.
- Organize an inventory crew in collaboration with the MoA at the Head Office.

Actions:-

- Prioritize among the regional forest priority areas.
- Conduct inventory.

(i) Development and Rehabilitation of Industrial Plantations

Objectives:-

- To increase the supply of industrial wood and meet the demand of wood processing industries.
- To promote industrial plantation development through increased participation of the private sector.

Strategy:-

- Increase the supply of industrial wood to a level that correspond to the demand of the wood processing industries;
- Survey potential areas from the regional forest priority areas for the establishment of industrial plantation and leasing land to private investors.
- Facilitate land acquisition to private individuals (investors).
- Provide technical support to plantation establishment.

Actions:-

- Rehabilitate the industrial plantation already established to improve the quantity and quality for wood based industries.
- Establish industrial forest plantations within and around the RFPAs with potential for the expansion of industrial forests.

(ii) Restructuring and Rehabilitation Study of the Forest Industries

Objectives

- Assess and evaluate the present state of the forest based industries in order to determine the assistance and investment needed to up-grade the industries.
- Investigate the possibility of integrated ownership of the industrial forests and the forest industries.

Strategies:-

- Develop project areas whereby integrated development and utilization activities could be implemented, through which they can generate their own revenue and establish commercial industrial forest plantation.
- Develop forest industries so that they can utilize all the wood available from improved management of the forests and from the proposed industrial plantations development program.
- Renovate and expand wood based industries to maximize their contribution to the regional economy.

Actions:-

- Integrate forest development with forest based industries and develop an enterprise in selected model areas. This entails the integration of forest development activities with the production of wood products.
- Encourage the establishment of secondary wood processing industries with a view towards achieving greater utilization of the resources.
- Prepare proposal for the rehabilitation and integration of some of the selected forest based industries and forests.
- Assess the viability of integration of forest and forest industries.

C. Project Profiles

(i) Rehabilitation Study for the Wood-based Industries in Oromiya region.

Project Title

Rehabilitation Study for the Wood-based Industries in Oromiya region.

Duration

One year

Implementing Agency

Bureau of Agriculture of Oromiya

Background and Justification

The forest industries which mainly rely on the forest resources of Oromiya region are diversified and contain two plywood factories, two particle board factories, one fiber board factory, six mobile sawmills and twenty four stationary sawmills. However, the number is not known, there are also many joinery and furniture units which mainly use illegal sources of raw material. Most of these wood-based industries are worn-out with low operating efficiency, high wastage and financial constraints for up-grading and rehabilitation. The performance of most industries is low and work below capacity. Most of the industries use rudimentary and inefficient technology. They are suited only to bigger diameter logs and are equipped with old and poorly maintained machinery with frequent breakdowns. There has been no investment in the sector. Unless action is taken to renovate this, they will not be capable of consuming the increasing volume

from the improved management of the natural forests. This requires the assessment of the industries which require rehabilitation.

Objectives:

- Assessment of the viability of the forest industries with respect to:-
 - availability of raw materials both current and projected.
 - technical conditions physical conditions and performance of the forest industries.
- Formulate rehabilitation proposal including rehabilitation cost.

Activities

- Determination of the assistance and investment needed to renovate wood-based industries.
- Estimate present profitability.
- Rehabilitation plan and investment requirement for rehabilitation.
- Identification of the possible industrial forest development areas among the existing regional forest priority areas.
- Develop rehabilitation plan and investment requirement for rehabilitation.

Expected Outputs

- Preliminary implementation plan for the integration program and the strategy and resources required to implement the program.
- In phase I of the study, the required investment for rehabilitation will be finalized.
- In phase II of the study, detailed rehabilitation plan for those selected for rehabilitation will be prepared.

The decision would be based on the availability of wood raw material, the estimated cost for rehabilitation and the economic profitability of the industries.

Estimated Cost:-

Two local senior experts in forestry and forest based industries supported by an international consultant shall be engaged in the study. The estimated costs would be:

- International Consultant 840,000 Birr
- Two senior experts 120,000 Birr
- Transport cost 110,000 Birr
- Contingency 107,000 Birr
- Total **1,177,000** Birr

Benefits:-

Both the development sector and the wood-based industries benefit through integrated development and management of industrial forest and forest industries.

Risks:-

Unless land is secured for the establishment industrial plantation, the future raw material supply will be at risk.

(ii) Study project on the Establishment of forest based industries in Oromiya region

Project Title

Study project on the Establishment of forest based industries in Oromiya region.

Duration

One year

Implementing Agency

Bureau of Agriculture of Oromiya

Background and Justification

There is no reliable information of the forest area, raw material resources available or annual allowable cut. The information available on growth rate and the utilization potential of the remaining high forests and plantation forests is not reliable and consistent. This limits the capacity to plan and implement the sustained supply of raw material to the wood-based industries. It is therefore, essential to assess the potential of the industrial plantation forests and the remaining high forests with timber potential to plan the sustained utilization of the remaining resources. The commercial forest area should be delineated and demarcated. No forest utilization should be allowed without a valid management plan approved by the Bureau of Agriculture of Oromiya region. The study project will be carried out and implemented in conjunction with the program proposed in the Forest Management part of the regional program of assessment, rehabilitation and expansion of plantations.

Objectives:

- Study the capacity of the forests to supply forest industries,
- Conduct inventory of the forest and prioritize the forest areas according to their potential,
- Develop and implement utilization plan,
- Carry out a pre-feasibility study to select location for new forest industry units.

Activities

- Review previous studies made in the region regarding forest area and stock.
- Assess the availability of raw material for the wood based industries.
- Assess the availability of land for the expansion of industrial plantation.
- Estimate the growing stock and determine the annual allowable cut.
- Identify best location for the installation of the industry.
- Assessment of the possible areas among the RFPA's for the establishment of mobile sawmills and the selection of the most suitable areas for the establishment and implementation.

Expected Outputs

Industrial development plan including areas to be developed.

Estimated Cost:-

- International consultant 700,000 Birr
- Local Experts (2) 100,000 Birr
- Transport cost 120,000 Birr
- Contingency 92,000 Birr

- Total Cost **1,012,000** Birr

Benefits:-

A well balanced industrial development program.

Risks:-

No risk is involved.

(iii) Pre-feasibility study to establish an integrated forest development and wood-based industries.

Project Title

Pre-feasibility study to establish an integrated forest development and wood-based industries

Duration

One year

Implementing Agency

Bureau of Agriculture of Oromiya

Background and Justification

Currently, the administration and management of industrial forest development and wood processing plants is mutually separate except in Munessa-Shashemene Forest Development and Utilization Project and Tiro- Boter Becho where the possible complementary of the activities has been exploited to some extent.

Forest development areas have not been planned in consideration of the harvesting and no effort has been made to plan the area harvested to match the reforestation. The intention of the integrated management of forests and forest industries is to develop an autonomous and self-supporting units whereby each unit is responsible for silviculture, logging, transport, industrial production and marketing. The organizations thus created will operate with a high degree of autonomy including the right to utilize its resources and revenues for investment.

Objectives:-

- The study is aimed at assessing the potential of the regional forest priority areas for the establishment of forest based industries.
- To develop an industrial forest
- Assess the potential of each forest priority area and prioritize the areas according to their potential.

Activities

- Assess the available raw material
- Assess the land available for the expansion of industrial plantation
- Identify forest areas which are profitable for development into an enterprise.

Expected Outputs:-

Study document for the integration of selected forests and forest industries.

Estimated Cost:-

- International consultant (2) 1,400,000 Birr
- Senior Forest Experts (2) 100,000 Birr
- Experts in Forest Industries (2) 100,000 Birr
- Contingency 160,000 Birr
- Total Cost **1,762,904** Birr

Benefits:-

Both the development sector and the wood-based industries benefit through integrated development and management of industrial forest and forest industries.

Risks:-

Unless land is secured for industrial plantation establishment, the future raw material supply will be at risk.

Private Wood-Based Industries engaged in Oromiya Region

No.	Name of Sawmill	Location	Previous Area of Production
1	Asfaw Getahun	Illubabor	Gergedda
2	Seyoum Biadgilign	Wollega	Gergo-Watto
3	General Wood Work	Wellega	Chato
4	Abrham Zeleke	Gimma	Babiya Folla
5	Almaz Goshu	Gimma	Belete Gera
6	Gino Guarnair	Illubabor	Sigmo Geba
7	Hailuna Siraw	Illubabor	Sigmo Geba
8	Yohanis Papatike	Adaba	Bale
9	Militia Govani	Illubabor	Sylum wangus
10	Militia Salvatori	Illubabor	Belete Gera

Forest Industries of the Ministry of Construction Operating in Oromiya

No	Name of Industry	Location	Annual Consum. of logs in m ³
1	Wanza (Jimma)	Jimma	3574
2	Ethio-Enterprise	Jimma	-
3	Jimma Saw mills	Jimma	4951
4	Wanza (Awasa)	Awassa	-

Wood Based Industries Owned by Sawmills and Joinery production and Marketing Enterprise

No.	Name of Sawmill	Location
1	Hegere Mariam	Borena
2	Zenbaba Woha	Borena
3	Wadera	Borena
4	Avalo	Borena
5	Ambo	West Shewa
6	Illubabor Becho	Illubabor
7	Gilgel Gibe	Jimma
8	Veneer machine	Jimma
9	Din Din	Hararghe
10	Aetero	Arsi
11	Gefere	West Wollega
12	Pangalos (3)	Jimma
13	Dello Mena	Bale
14	Gigessa	Bale
15	Boter Becho	Jimma

**Actual Production of Logs for Some of
the Wood Based Industries in Oromiya Region**

Name of Sawmill	Year of Production (M ³ of logs)			
	1993/94	1994/95	1995/96	1996/97
<i>Ambo</i>	1612	1102	770	
<i>Gefere</i>	1123	663	506	
<i>Asfaw Getahun</i>	1930	-	-	
<i>Illubabor Becho</i>	1186	1100	594	
<i>Militia Salvatory</i>	793	438	-	
<i>Jirro Guarner</i>	882	417	-	
<i>Hailu & Siraw</i>	810	180	-	
<i>Milita Jovani</i>	1291	-	-	
<i>Ethio-work No. 3</i>	681	681	-	
<i>Boter Becho</i>	781	587	594	
<i>Gilgel Gibe</i>	2182	773	714	
<i>Veneer Machine</i>	225	533	-	
<i>Ethio-Enterprise</i>	3413	2000	2001	
<i>Jimma</i>	1363	670	670	
<i>Wanza</i>	2921	-	687	
<i>Almaz Goshu</i>	930	320	-	
<i>Hagere Mariam</i>	2003	735	470	
<i>Zenbaba Wuha</i>	1700	991	646	
<i>Wadera</i>	3282	1361	926	
<i>Abalo</i>	1950	1950	102	
<i>Dello mena</i>	3251	1430	1349	
<i>Jiggessa</i>	1634	-	-	
<i>Arabajuju</i>	1794	81	-	-
<i>Din Din</i>	2013	1042	-	-

Industrial and Construction Wood Production In Oromiya

Product type	Unit	1990	1991	1992	1993	1994
Sawnwood	M ³	69,980	39,800	68,000	44,820	4,000
Pole	M ³	7,107	4,653	7,096	6,979	5,816
Construction Pole	M ³	24,931	14,871	24,668	24,264	20,264

Current and Projected demand for Industrial and Construction wood in m3
(Oromiya Region).

Year	Industrial & Construction wood demand in million
1998	2.7
1999	2.7
2000	2.8
2001	2.9
2002	3.0
2003	3.1
2004	3.2
2005	3.3
2006	3.4
2007	3.5
2008	3.6
2009	3.8
2010	3.9
2011	4.0
2012	4.1
2013	4.3
2014	4.4
2015	4.5
2016	4.7
2017	4.8

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CHAPTER 7 FUEL-WOOD PROGRAM: Future Programme of Action

A. Strategies and Action Programmes

(i) Direct Strategies

Increase the production of fuelwood

- Farm Forestry
- Community Forestry
- Peri-urban fuelwood development
- Industrial Plantation
- Woodland Management
- Biogas and Briguetting

(ii) Indirect Strategies

- Intensification of crop production in areas of agricultural expansion and deforestation.
- Intensification of crop production in the shifting cultivation and agro-pastoral landuse systems.

(iii) Reducing the Demand for Woody Biomass

- Increasing efficiency in use
- Alternative Energy Sources
- Demonstrate New Promising Technologies
- Create Incentives for Industrial Energy Efficiency Improvement.

B. General objectives of the programme

- To ensure a reliable supply of energy at affordable price
- To stream-line and remove bottle-necks encountered in the development and utilization of energy resources;
- To increase energy utilization efficiency and reduce energy waste;
- To give priority to the development of indigenous energy resources with a goal of attaining self sufficiency;
- To provide appropriate technologies and alternative energy sources to different sectors;
- To ensure community participation, especially the participation women, in all aspects of energy resources development and utilization.

C. General Considerations

Fuel security depends on developing sources of energy to establish and sustain a balance between supply and demand for the Region's growing population and the energy requirements of its developing economic sector. In most parts of the Region the demand for energy is being met in way, most noticeably by the depletion of the forest resources but also through the burning of dung and agri-residues which in the long - term reduces the fertility of land. There are also demands for energy which are not being met, notably unsatisfied demands for electricity.

An optimum strategy to meet the development objectives of the Region will incorporate several key features:

- It will give priority to supplying energy from indigenous and especially from renewable resources;
- It will seek to mobilize private sectors human and financial resources;
- It will promote practical community participation in the planning and implementation of initiatives pertaining to energy supply development and demand management;
- It will include a mixture of short, medium and long-term initiatives in which there is logical, coordinated progress with programmes and a projects begun in the short term paving the way for subsequent interventions.

D. Breakdown of Strategies

(i) Short-term

The strategy for energy security must start by immediately addressing priority needs. These needs include establishing balance between energy supply and demand in areas where inadequate supply is causing hardship (i.e time required to gather fuel or degradation of the environment). The main energy problems in specific areas is an inadequate supply of wood to meet domestic needs for cooking. The downward spiral of depletion must be halted as a priority, because it becomes increasingly costly to reverse the longer it is allowed to continue.

To improve fuelwood supply, measures must be taken in the short-term to incorporate more trees within integrated farming systems. More community plantations should be established, especially on agricultural marginal lands. This by no means a new strategy. Farmers have already started to establish their own woodlot which should be strengthened. Tree planting is not only a short-term strategy. It will need to continue and increase into the medium and longer term. Fuelwood supply will not immediately increase, as the trees will take at least 5-6 years to grow before they can be harvested.

Interventions to reduce energy demand by improving the efficiency in end-use are also envisaged as a strategic element for short term application, because they can be implemented rapidly, at low cost and with significant results.

(ii) Medium-term

In the medium term, the predominant demand for household energy will continue to be for cooking. The tendency in bigger towns is to switch cooking fuels from fuelwood to charcoal, to kerosene, to liquefied petroleum gas (LPG) or electricity. The cost of using each of these sources of energy, including the cost of the corresponding stove, typically increases (although kerosene is priced below cost and is cheaper than charcoal in many places). However, other characteristics, especially convenience and cleanliness, make electricity more attractive for those who can afford it. Consequently, with an anticipated growth in incomes in the medium-term (and beyond), household demand for electricity is expected to grow most rapidly. Economic development will also mean that commercial and industrial demand for energy, which are primarily for electricity and diesel, will also grow. Consequently, the medium-term strategy must look to the continuous improvement of the electricity supply system.

(iii) Long-term

In the long-term, the hydro-power resources of the region and the country as a whole will be harnessed with the development of major facilities in most river basins. The long-term economic development of the Region, and of the country as a whole, require foreign exchange earnings. Hydro-power, as one of the country's major resources, can and indeed must eventually make a significant contribution to foreign exchange earnings. In 20-30 years and beyond, many more places will have electricity available.

Even in the long-term, the predominant source of energy for people in the Region will continue to be wood. Practices by which areas can meet their own local needs in a sustainable manner should be well established in the long-term.

E. Specific actions and Strategies

(i) Establishment of Urban and Peri-Urban Fuel-wood Plantations

Issues

One of the most important issue in the future of the Region as well as the whole country is the supply of household fuel. The increasing scarcity and cost of household fuels, particularly firewood, threaten the ability of country even to maintain the already existing low income and the poor quality of the life of the people. The ever increasing need for biomass fuels especially fuelwood which is driven by high population growth has led to mass deforestation and soil erosion which now threaten agricultural productivity.

Given the fact that supply of modern fuel such as electricity and kerosene are restricted due to limited investment in electricity generating plants and foreign currency requirement to import fossil fuels, the region/country will have to continue to rely on fuelwood as the main source of energy for the majority of its population. In this respect the intensification of fuelwood plantation programmes should be among the priority activities of the region.

Actions

- Allow investors and individuals to participate in large / small scale fuelwood plantation establishment.
- Allocate marginal land for fuelwood plantation development, the land should be free from any form of encroachment from the local people.
- Organize the forestry sector in offering adequate extension services, technical support.
- Organize the forestry sector to offer or advise in planning, monitoring and evaluation of future fuelwood plantation projects.
- Carry out proper socio-economic and environmental impacts of the proposed fuelwood projects based on with and without the project principles.
- The Region's forest and land ownership policy needs to be officially announced to obtain full participation from investors and private tree growers.
- Prepare a management plan for large scale fuelwood plantations.
- Set up compensation measures for those people who might lose their land and other property for the purpose of fuelwood tree planting programme.
- Establish nurseries and produce healthy and vigorous seedlings.
- Organize project offices with staff, equipment, transport, office facilities, etc., depending on the need.
- Set up technical guidelines on nursery, management, plantation establishment, silvicultural treatments.

(ii) Tree Planting by Farming Communities/Agro Forestry

Objectives of farm forestry

The long-term objectives of farm forestry programme are:

- to meet the basic needs of the people for fuelwood, construction wood, fodder and other major and minor forest products, on a sustained basis;
- to contribute to increased food production through reduced land degradation and increased soil fertility through an effective interaction between trees and food crops;
- to contribute to increased farm household income through the sale of surplus fuelwood and fodder;
- to reduce the fuelwood collection and fetching burden of women, thus freeing women's energies for other development activities;
- In the short and the medium term the objectives of farm forestry are:
- to promote the participation of people in the conservation, management and development of existing forests and woodlands;
- to promote the participation of people in planting and management of trees on an individual and/or community basis;
- to develop the legal framework necessary for enhancing the contribution of individuals, user groups, community and institutions in the development, management and conservation of forest resources.

Farm Forestry Strategies/Technologies

Farm forestry development strategies comprises a mix of technologies. The strategy is based on promoting, improving and expanding these technologies that are likely to prove successful, and on increasing the technology mix as the conditions for introducing other technologies improve. Hence the following development strategies are:

Promotion and Expansion of Homestead Tree Planting and Management

Homestead tree planting may be carried out in rows around homestead, around village settlements, or as group planting within the homestead. The form of homestead tree planting will depend on the needs and preference of households or the community. Furthermore, species choice, spacing between trees and planting configuration will have to take into account the preference of the participants. Species for homestead tree planting should be selected on the basis of the needs and interests of the participants to meet their fuelwood, small pole and fodder requirements.

Woodlot

Before the nationalization of rural lands, there were some initiatives to establish farm woodlots. These varied in size from a few square meters in the rural areas, to large woodlots in the peri-urban areas. In the later case, woodlots were established for the production of fuelwood and small poles for which there was a flourishing market. The shortage of land has been and will continue to be a limiting factor to woodlot establishment.

Field trees

The integration of trees in farming systems could take the form of increasing the number of scattered trees left on-farm or planting seedlings. The primary purpose would be to enhance soil fertility, and provide some fuelwood, fencing material, and fodder in the form of pods and/or foliage.

Promotion and Expansion of the Use of Live Fences/Farm Boundary Planting

Farm boundary/live fence tree planting including protection against damage by animals is a pre-condition for the integration of trees on farms. Trees should be planted in one or two rows along the farm boundary. Species for farm boundary planting or live fences should preferably be those that are easily established by

cuttings. These may include *Euphorbia sp.*, *Adathodia schimperiana*, *Commiphora Sp.*, *Dovalis Cafra*, *Erythrina abyssinica*, *Agava Sisalina*, *Ziziphus spp.*

Promotion of tree planting along Roadside and paths

There are often areas along roads and paths that could be set aside for tree planting, which could provide shade, wood, fodder, etc., if properly managed. Ownership and access to land (and any related tree products) along roadside and paths would have to be made absolutely clear early in the design phase.

When species for such planting are selected, their spacing, size at maturity, the extent of their root systems and their management should be taken in to account in relation to the adjacent land use, including drainage ways. The protection of roadside trees is very difficult due to their exposure to trampling, browsing and grazing animals using the roads and paths. Thus, trees with rapid establishment and unpalatability characteristics should be selected.

Actions to be taken

- Determine the forest ownership/land tenure rights of farmers or of those who will be involved in tree planting in rural Ethiopia.
- Encourage private individual farmers, and farming communities to plant trees both for their own use and profit by making them aware of the potential benefits of tree farming.
- Provide credit facilities, technical advice, seed, and other assistance to ensure the full motivation of the farming communities towards tree planting.
- Determine the set up of free marketing systems and organizations for effective marketing of fuelwood, poles and other forest products.
- Design a system for recording and mapping the existing and potential areas for future tree planting schemes by the farming communities.
- Encourage the farming tree growers to also plant tree species which have multi-purpose end uses, e.g. soil conservation, soil enrichment and fodder.
- Introduce a grant scheme who may have a desire to plant trees on marginal lands for agriculture or grazing.
- Provide free seedlings for farmers who may agree to plant trees and offer the required tending after planting.
- Design a system to evaluate the success of tree planting by farmers and reward them according to their merit.

Note: For possible project profiles in Agro-forestry refer to the Agro-forestry sectoral study.

(iii) To Increase the Participation of Women in Forest Development

The role of women in woodfuel production and utilization is very high for two very important reasons: One is that women are exposed to woodfuel problems and are believed to appreciate the wood fuel price more than male household members. The second reason is that women are directly involved in cooking and could be more responsive in management and conservation programmes.

Actions to be Taken

- Encourage women to enroll in the forestry training institutions, and also involve them in extension services to secure the participation of women in forestry development.
- Define the role of women in forest conservation and development in the Nation Forest Policy.
- Raise the awareness of the local women about the role they can play in woodfuel energy production, energy conservation and efficiency in energy utilization.

- Give access to forest land resources and organize credit facilities to women who will be involved in tree planting for their own use and profit making.
- Involve women in local research on the adoption of new stoves, initial technology design, means of food preparation for reducing indoor air pollution, socio-cultural studies and other forestry research areas.
- Initiate science and technology programmes in order to develop alternative domestic and other energy resources.
- Organize community and high level training and extension services for women in the area of forest conservation, development and efficient utilization of woody biomass.
- Develop efficient stoves in woodfuel saving and transport technologies to improve energy efficiency, which is the burden of women and needs to be integrated in the overall household energy planning policy.
- Involve women professionals in forest development programmes such as planning, implementation, evaluation and decision-making.

(iv) To Develop Alternative Energy Sources

Action to be Taken

- Develop a national energy policy to develop and utilize the energy potentials of the Region.
- Develop the institutional set-up of the energy sector with adequate man power, machinery, equipment and laboratory facilities.
- Initiate research and development of new cooking fuels and improvement of energy conversion technologies.
- Extend the availability of modern fuel such as, electricity, kerosene and LPG to urban areas of the Region.
- Encourage the development of agri-residue briquetting and biogas in rural areas and find ways and means to subsidize capital costs for the development of the devices.
- Develop the utilization of lignite and natural gas for household energy use.
- Assess potential areas for peat exploitation and if available, train the local community on the exploitation techniques and utilization.

(v) To Initiate Effective Policies for Woodfuel and Energy Development

Actions to be Taken

- Review & finalize the existing draft forest policy in order to give consideration for the woodfuel and energy problems and show their impacts on the forest resources.
- Devise a land ownership or tenure policy which would encourage the public to participate in forest development and conservation.
- Revise the existing credit policies of Banks for attracting investors and individuals to invest on forest development.
- Make sure that future policies to be issued are addressing the long term problems of the forestry sector and have consistency during implementation.
- Devise a system to control the private woodfuel market prices for protecting the consumers from being over charged.
- Realize the establishment of an appropriate regulatory body to ensure proper marketing management.

(vi) To Formulate Appropriate Household Energy Policies

Actions to be Taken

- Increasing the supply of woody biomass through formulation of a favorable forest management programme and reforestation projects, application of proper land-use practices, promotion of incentives for individual producers and setting of clear land ownership rights may contribute in the augmentation of household woodfuel supply. Also:
 - establishment of appropriate regulatory body to ensure proper market management;
 - proper utilization of poorly managed biomass resources and introduction of conservation practices in the conversion processes; and
 - conversion of unutilized crop residues to briquettes.
- Increasing the supply of alternative commercial energy sources like:-
 - increase in the supply of kerosene and kerosene stoves as short term measures;
 - expanding the supply of LPG and increase in its applications and bottles;
 - further promotion of the communal electric injera baking establishment to enable poorer households get access to electricity for injera baking; and
 - creation of credit facilities to the appliance market such as kerosene stoves, electric stoves, electric mitads, gas stoves and gas bottles.
- Introduction of appropriate household energy pricing policies:-
 - woodfuel pricing policies in favor of increased woodfuel supply, conservation practices and in creating the access of low income households to be able to purchase woodfuel;
 - petroleum product pricing like the pricing of kerosene in favor of the poor to use it as a back-up fuel;
 - pricing of gas and electricity will also have to be recommended with three objectives in mind- being efficient pricing, promoting conservation in using these fuels and facilitating of transition of a large proportion of the urban population towards using gas and electricity; and
 - introduction of an integrated pricing framework that accounts for the effect of pricing of one household fuel on the demand and price of other fuels should be encouraged.
- Application of demand management and conservation policies:-
 - implementation of the traditional stove programme like wood burning stoves, charcoal stoves, briquette stoves, and biomass injera baking mitads;
 - further R&D in future stove design and development specially for rural areas;
 - establishment of an independent body that initiates, promotes and follows up the production and dissemination of efficient stoves;
 - further improvement of commercial fuel using stoves like the electric mitad and kerosene stoves;
 - raising public awareness to ensure the adaptation of energy conservation programmes; and
 - giving financial and material incentives like credit facilities to encourage households to apply conservation measures.

F. Project Profiles

(i) Project Profile 1

Title of project

Promotion of the establishment of private plantations.

Location

All zones of Oromia Region.

Duration

2 years.

Implementing Agency

To be identified.

Executing Agency

Ministry of Agriculture.

Donor

To be identified.

Problems to be addressed

The production of wood is commercial viable activity. Still private investment in wood plantation in the region is very limited. The proposed project will address this problem by studying the reasons for this lack of interest and propose ways to overcome these, Further the project will prepare detailed project proposals for the establishment of financial feasible wood plantations (including area, location, investment required, financial returns, required permissions and clearances).

Direct Target Beneficiaries

Potential private investors in fuelwood plantation in the Region.

Development objective of project

To reduce the demand -sustainable gap for fuelwood and therewith, reduce the rate of deforestation.

Immediate objective of project

To reduce the threshold for private investors to invest in fuelwood plantation in the region by providing detailed project proposal for possible financially viable plantation in the region. These proposals will substantially reduce the pre-project cost for private investors and will make them aware of the existing possibilities.

Outputs of the Project

- One report on the constraints for private investors to invest in fuelwood plantations in the region. The report will include technical, economical, social, organizational, infrastructure and managerial constraints. Further the report will contain recommendations to overcome these constraints.
- One report on study in possible sites in the region for the establishment of fuelwood plantations by private investors. This report will not only contain the technical details but also details such as ownership, possibility for sale or lease, applicable legislation, required permit etc.
- At least 10 detailed project outlines for the establishment of fuelwood plantations in the region giving priority to highly deficit zones.

Summary of Activities

1. Conducting of detailed studies on constraints and preparation of reports.
2. Studying potential sites for the establishment of fuelwood plantations and preparation of reports.
3. Selection of most promising sites and preparation of reports.
4. Organization and conducting of an investment forum on investment in fuelwood plantation, possibly in combination with other investment forum.

Additional Information

The project would be successful in the 10 project proposals prepared would lead to private investment in fuelwood plantation. The average size of the proposed plantation is expects to be 100 hectares. The total private investment required to establish the plantation would be 700,000 US \$ or 4.2 million Birr.

Estimated Cost

1,350,000 Birr.	
International forestry expert, 6 months	(432,000 Birr)
3 local foresters, 72 months	(108,000 Birr)
Drivers 48 months	(14,400 Birr)
DSA local 1000 days	(32,000 Birr)
2 4WD cars (500,000 Birr), fuel & maintaining	(100,000 Birr)
Investment forum	(120,000 Birr)

(ii) Project Profile 2

Title of the project

Demonstration of the biogas technology in the commercial sector.

Location

To be identified.

Duration

3 years.

Estimated cost

1,000,000 Birr.

Donor

To be identified.

Implementing Agency.

Ethiopian Energy Studies & Research Center in association with MOA Rural Technology.

Executing Agency

Ministry of Mines and Energy.

Problems to be Addressed.

The majority of the Region zones are confronted with a severe fuelwood crisis. The annual use is much higher than the annual incremental yields. The result of this is wide spread deforestation and further land degradation. To produce more wood in order to close the fuelwood demand supply gap is practically not possible. Therefore, alternative sources of energy need to be used. Dung is one of these alternatives. At present about 11% of all cattle dung produced is used for energy. It is expected that because of improvements in energy efficiency and fuel switching not more dung and fuelwood will be needed even when the population increases. This shows that there will be an increase in dung availability to convert it to biogas production.

Direct target Beneficiaries.

The owners and operations of the establishment.

Development objective of project.

To reduce the demand sustainable supply gap for fuelwood.

Immediate objective of project.

To show that biogas is a practical and financial viable renewable energy option.

Outputs of the Project

1. Demonstrated technical, economical and social viability of biogas plants in the commercial sector.
2. Trained people in biogas technology
3. Private sector aware of the potential of introducing biogas.

Summary of activities

1. Study on factors responsible for success or failure of biogas projects and preparation of reports.
2. Identification of potential sectors in which biogas plants could be installed.
3. Promotion of the biogas technology idea in the most promising sectors.
4. Selection of sites to install the biogas plants.
5. Installation, assistance, troubleshooting and monitoring.

Organization of the Project

The EESRC has a vast experience in introducing new technologies involving the private sector. They have successfully introduced the Lakech and Mirt stoves by involving and interesting the private sector in the manufacturing. The reported failures of biogas plants in the past are mainly with plants installed at farm level. It appears that the chance of success is much greater with biogas plants at the commercial sector as this sector experience directly the financial benefits this and normally employ someone to operate and feed the system.

Additional information

A 16 m³ biogas plant with an initial investment of 8,000 Birr can save about 20 tones of fuelwood a year, which is roughly equivalent to 10,000 Birr/year such project has thus a very short pay back time. Next to the financial benefit the owner stresses the advantage of the excellent regulatory characteristics if the biogas flame, the smoke free combustion and ease of operation.

(iii) Project Profile 3

Title

Support to the improved stove dissemination programme of the Ministry of Mines and Energy.

Location

Whole Region.

Duration

3 years.

Estimated cost.

2,300,000 Birr.

10 Professional staff full-time employed	(360,000 Birr)
5 Drivers full time employed	(63,000 Birr)
5 4WD cars	(1,000,000 Birr)
Fuel & Maintenance	(700,000 Birr)
Perdiem each 150 days year	(60,000 Birr)
Contingency	(65,000 Birr)

Donor

To be identified.

Implementing Agency.

- Ethiopian Energy Study and Research Center.
- Zonal Rural Technology Promotion Center
- Other to be identified.

Executing Agency.

Ministry of Mines & Energy.

Problems to be Addressed

In most zones of the region more fuelwood is consumed than produced. The result is deforestation and land degradation. To reduce the rate of deforestation the production of fuel has to increase and the use of wood should be minimized where possible. Due to population growth the demand is expected to increase. To temper this effect there is a need to accelerate the dissemination of improved cooking stoves both in rural and urban areas..

Direct target Beneficiaries

- Potential manufactures of improves household stoves.
- Rural and urban population who will consume less wood and charcoal and therewith save money and time.

Development Objective of Project

To reduce the demand- sustainable supply gap of fuelwood and reduce the rate of deforestation.

Immediate Objective of Project

To disseminate 75,000 improved Injera stoves (70% rural & 30% urban areas) and 250,000 improves charcoal stoves (90% rural 10% urban) before the end of 2001.

Outputs of the Project

1. 75,000 improved Injera stoves disseminated.
2. 250,000 improved charcoal stoves disseminated.
3. 125 improved Injera stove manufactures trained.
4. 250 improved charcoal stove manufactures trained.

Summary of Activities.

1. recruitment and training of professional experts
2. field survey and training of manufactures
3. evaluation.

Organization of the Project

The implementing agencies are recruited by the executing agency to carry out the project.

Additional Information

The saving with the improved Injera stove are estimated at 3000 MJ/stove/ year (compared traditional Injera mitad) while the savings with the improved charcoal stove are 2000 MJ /stove/ year (compared to traditional charcoal stove)

This results in a total saving of 675 million MJ on fuelwood or 42 thousand tones of fuelwood and 1500 million MJ charcoal or 52 thousand tones of charcoal which is equivalent to 260 thousand tones of fuelwood. The total saving is about 302 thousand tones of fuelwood or 50,000 M³ of wood. With an average standing stock of say 50 m³/ha this comes to be around 10,000 hectares of forest or when supplied from plantation with an IY of 14 m³/hector this will be 36,000 ha.

(iv) Project Profile 4

Title of project

Dissemination of kerosene wick stove

Location

Whole Region

Duration

3 years.

Estimated cost

11,300,000 Birr.	
revolving fund set-up to purchase initial 100,000 stoves	(9 million Birr)
4 professional staff full time employed for 3 years	(144,000 Birr)
4 drives full time employed for 3 years	(50,400 Birr)
2 4WD cars (500,000 Birr), 2 trucks	(600,000 Birr)
maintenance & fuel	(900,000 Birr)
DSA	(99,000 Birr)
Contingency	(80,000 Birr)

Donor

To be identified.

Implementing Agency

ODA

Others to be identified.

Executing Agency

Ministry of Mines and Energy.

Problem to be addressed

Charcoal demand for boiling and cooking operation consumes a large amount of fuelwood. For each tone of charcoal about 5 tones of fuelwood is required. In the region more fuelwood is consumed than sustainable produced. The result is deforestation. To reduce the speed of deforestation the consumption of wood has to be reduced. One possibility is to replace charcoal by kerosene. To achieve made available to both rural and urban people.

Direct target Beneficiaries

Urban and Rural population who will save money on cooking.

Development objective of project

To reduce the demand sustainable supply gap for fuelwood and there with reduce the rate of deforestation.

Immediate objective of project

To disseminate 200,000 kerosene stoves 980% in rural and 10% in urban areas.)

Outputs of the Project

1. 200,000 kerosene stoves disseminated.

Summary of Activities

1. formally setting up the bank arrangement
2. import of kerosene stoves
3. dissemination of the stoves
4. monitoring and evaluation

Organization of the project

The NGO's will be contracted to implement the project.

Additional Information

Each stove will replace 130 kg of charcoal each year. If all stoves are disseminated the total replacement is 26 thousand tones of charcoal each year. This is equivalent to 130 thousand tones or 216,667 m³ of fuelwood with 14 m³ IY this is about 15,500 ha plantation.

Prerequisite

This project would only be possible when it is confirmed that the required kerosene can be imported. This depends on the expected export earnings, the percentage of the region is prepared to spend on petroleum products imports and the expected oil price. Only if the assumptions made are validated imports of kerosene to replace charcoal can be considered.

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Appendix 2b: Regional Energy Consumption in the Household Sector by End-uses and Rural/Urban Category in 1984 (TJ).

<i>Settlement/Energy Source</i>	<i>Mitad Baniking</i>	<i>Other Cooking</i>	<i>Lighting</i>	<i>Ironing</i>	<i>Other Uses</i>	<i>Total</i>
Rural Settlements	214436	160972	61626	17	-	437051
Percentage Total	49	37	14	-	-	100
Woody Biomass	155644	141282	61568	15	-	358510
Other Biomass	58792	19624	-	-	-	78416
Commercial Fuels	-	65	59	1	-	125
Oil Products	-	65	59	1	-	125
Electricity	-	-	-	-	-	-
Urban Settlement	18255	15513	1678	248	36	35730
Percentage Total	51	43	5	0.7	0.1	100
Woody Biomass	14659	13194	941	-	-	29005
Other Biomass	3512	1281	-	-	-	4793
Commercial Fuels	82	1039	733	39	36	1930
Oil Products	-	1034	139	16	-	1189
Electricity	82	5	594	23	36	741
Total	232691	176485	63304	265	36	422781
Percentage Share	49	37	13	0.06	0.007	100

Source: CESEN/ENEC, Main Report, 1986. P. 37

Appendix 2b Regional Energy Consumption in domestic uses by fuel and end-use

No	fuel, Settlement Type	End-use							Total	Fuel Share %
		Mitad baking	Other Cooking	Ironing	Direct Heat	Lightning	Other Use			
1	Rural settlement									
	Woody biomass	1195.49	1412.23	0.620.53	279.81	347.66	0	3235.81	79.93	
	agriresidues	183.9	75.7	0.06	8.3	7.94	0	276.38	6.83	
	cow dung	318.44	183.48	0.08	13.77	0.01	0	515.75	12.74	
	charcoal	0	0.67	0.02	0.18	0	0	0.94	0.02	
	oil products	0	0.86	0	0	18.58	0	19.46	0.48	
	electricity	0	0	1.31	0	0.09	0	0.09	0	
	Total	1697.82	1672.94		302.07	374.28	0	4048.42	100	
2	Small urban settlement									
	woody biomass	776	918.46	1.91	37.3	38.08	0	1771.8	87.39	
	agriresidues	15.23	4.81	0	0	0	0	20.06	0.99	
	cowdung	86.53	11.84	0	0.08	0.08	0	98.54	4.86	
	charcoal	0	69.73	2.27	10.98	0	0	82.98	4.09	
	oil products	0	2.19	0	0	47.66	0.21	50.06	2.47	
	electricity	0	0	0.02	0	3.03	0.06	3.11	0.16	
	other fuels	0	0	0	0	0.63	0.25	0.89	0.04	
	Ttoal	877.8	1007.04	4.25	48.36	89.48	0.52	2027.43	100	
3	Medium to large urban settlements									
	woody biomass	686.7	404	1	9.37	1.09	0.58	1103.01	69.59	
	agriresidues	61.22	16.14	0.19	0.18	0.23	0	77.96	4.92	
	cow dung	0	9.09	0.02	0.53	0.02	0.05	54.21	3.42	
	charcoal	0	217.18	3.14	12.03	0.01	0	232.36	14.66	
	oil products	0	79.3	2.14	0.03	10.15	1.02	92.64	5.85	
	electricity	0	0.19	0.41	0.13	16.29	3.33	24.34	1.54	
	other fuels	769.69	0	0	0	0.4	0	0.4	0.02	
	Total		725.91	6.9	22.27	28.19	4.98	1584.93	100	

Appendix 3 Estimates of the Area, Growth Stock, and Incremental Yields

<i>Forest Resource</i>	<i>Area million ha</i>	<i>Growth Stock m³s./ha</i>	<i>Annual Incremental Yields</i>	
			<i>Per Unit Area m³s./ha/a</i>	<i>Total million m³s</i>
Natural High Forest	2.3			0.3
Slightly Disturbed	0.7	90-120	5.7	
Heavily Disturbed	1.6	30-100	3.4	
Woodland	5.0	10-50	1.2	6.4
Bushland	20.0	5-30	0.2	4.0
Plantations	0.2		9.6-14.4 ²	1.6
Farm Forestry	n.a	n.z	n.a	2.1

Source: SFCDD Management Plan Inventories and EFAP mission estimates.

CHAPTER 8 ACTION PROGRAMMES FOR CONSERVING ECOSYSTEMS

Chapter eight of this document has outlined the problems of conserving ecosystems in Oromia and this chapter shall indicate the actions required to remove or alleviate these problems.

A. Objectives

B. Strategy, Action, and Investment

(i) Control Population Growth

As uncontrolled population growth against the finite natural resources like the ecosystem is harmful, the region has to implement the population policy of the country for the safety of both the human population and the ecosystems. In this process a realistic and pragmatic population planning should be put in place to ensure that the level of population growth rate in the region matches as closely as possible the support base available.

(ii) Mitigate rural poverty

In a situation of poverty where the human population is dependent on mother nature for livelihood, the endeavour of ecosystems conservation becomes a nightmare. Hence, it is mandatory to improve rural living conditions through family planning efforts, better farming systems and better education to change the style of life in the rural Oromia where 90% of the population lives.

(iii) Improve Farming Systems

Oromos are both croppers and livestock keepers depending upon the nature of the climate they happen to occupy. The cropping and the livestock keeping are both old and strongly competing with the shrinking ecosystems. Improved agricultural practices must be strongly implemented to enable farmers to produce more on less space so that shifting agriculture halted and ecosystems saved. Hence, raise the productive capacity of agricultural lands and methods to reduce the clearance of natural forests for new agricultural land, and increase fertiliser use.

(iv) Develop Participatory Ecosystems Management

It is highly essential that local communities living within or near managed ecosystems, such as National Parks and Wildlife Sanctuaries, be involved in the management and benefit sharing of the areas. The following actions are recommended to effect this idea.

(v) Compensate for loss of access to the ecosystems

Compensation schemes tend to be oriented around people living near protected ecosystems. They are directed towards those who might otherwise depend on the ecosystem as a source of livelihood. Compensation is usually in the form of cash payments or donations. It is also provided as goods or services, including basic social services such as school buildings, equipment purchases, construction and support of health clinics, family planning and sanitation programmes. Compensation is usually provided gratis, in exchange for agreements by local people to relinquish their rights of access to land set aside for an ecosystem and /or to co-operate with the objectives of an ecosystem conservation project.

b) Assist local communities to obtain revenue from protected ecosystems

Income generating activities should focus on people living around protected ecosystems. Employment opportunities include jobs as wardens, guides, scouts, manual labourers, administrative staff in the tourist industry. Enterprises are often developed based on wildlife products (e.g. tanning activities, civet-cat keeping, bee-keeping or game ranching) or on the tourist industry market (e.g. handicrafts or farm produce). Revenue-Sharing activities involve the distribution of both cash and non-cash income derived from tourist entrance fees, sport hunting and game cropping.

c) Provide Substitutes

Where access to wildlife resources (e.g. meat, forest products and land) has been denied, the strategy is often to provide substitutes for the losses. In order to remove pressure on the ecosystem, this strategy also aims to substitute more 'modern' methods for traditional methods of resource **management which are no longer viable** under increasing population densities. It is based on the principle that local people should not have to suffer a lower standard of living for the global benefit of preserving ecosystem. In order to alleviate the pressure on the ecosystems, various alternative resource management methods should be strongly supported and developed. These actions among others, should include:

Promotion of new crop varieties and cultivation methods; erosion control and soil conservation measures such as contour ridging and ploughing; energy-saving devices such as improved cooking stoves; irrigation works; tree seedling production for fuelwood, domestic timber and agroforestry; and provision of new water sources for humans and livestock.

d) Consult local communities over management decisions affecting them.

e) Provide controlled use rights to some of the resources In the ecosystems, provided conservation objectives are not seriously compromised.

(v) Allocate adequate fund to ecosystem conservation issues from regional government offer and look for more foreign aid towards the same purpose.

(vi) Build capacity through training in ecosystems conservation.

(vii) Promote awareness or ecosystems conservation. Educational programmes should be developed for popularising ecosystem conservation issues both with the public and government administration. Encourage establishment of more clubs and societies with conservation-oriented objectives.

(vii) Increase and improve the ecosystems conservation data base.

(viii) Give the protected areas legal status by getting them gazetted by the federal government.

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10. ANNEXES

Annex 1. ENDEMIC MAMMALS OF BALE MOUNTAINS NATIONAL PARK

Serial No.	Scientific Name	Common English Name
1	A. Blicki	
2	Canis Simensis	
3	Crocidura Baileyi	
4	C. bottegodies	
5	C. glassi	
6	C. herenna	<i>Herenna shrew</i>
7	C. lucina	
8	C. thalia	
9	Dendromus lovati	<i>Striped Climbing mouse</i>
10	Lepus starcki	<i>Strack's hare</i>
11	Lophuromys melanonyx	
12	Megadendromus nikolausi	
13	Mus mahomet	
14	Myotis setti	<i>Scott's mouse-eared bat</i>
15	P. albipes	<i>White-footed highland rat</i>
16	Stenocephalemys albocauda	<i>Narrow-headed highland rat</i>
17	S. griseicauda	
18	Tachyoryctes macrocephalus	<i>Giant molerat</i>
19	Tragelaphus buxtoni	<i>Mountain Nyala</i>

Serial No.	Scientific Name	Common English Name
1	Dendroica abyssinicus	<i>Abyssinian woodpecker</i>
2	Macronyx flavicollis	<i>Abyssinian Long-Claw</i>
3	Parophasma galinieri	<i>Abyssinian catbird</i>
4	Poicephalus flavifrons	<i>Yellow-throated seedeater</i>
5	S. nigriceps	<i>Black-headed siskin</i>
6	Vanellus melanocephalus	<i>Spot-breasted plover</i>
7	Agapornis taranta	<i>Black-winged lovebird</i>
8	Bostrychia carunculata	<i>Wattled Ibis</i>
9	Columba albitorques	<i>White-collared pigeon</i>
10	Corvus crassirostris	<i>Thick-billed raven</i>
11	Cyanochen cyanoptera	<i>Blue-winged goose</i>
12	Lybius undatus	<i>Banded barbeet</i>
13	M. semirufa	<i>White-winged cliff-chat</i>
14	Oriolus monacha	<i>Black-headed forest oriole</i>
15	Parus leuconotus	<i>White-backed Black tit</i>
16	Rallus rougetii	<i>Rouget's rail</i>

Annex 3. WILDLIFE PROTECTED AREAS IN OROMIA

Serial No.	Name of Protected area	Zonal Location	Conservation Category	Surface area in hectares
1	Bale Mountains.	Bale	National Park	247,100
2	Abijatta-Shalla Lakes	East Shewa	national Park	88,700
3	Yabello	Borena	Sanctuary	253,700
4	Dera-Dilfaqar	Arsi	Regional Park	2,500
5	Bale	Bale	Reserve	178,100
6	Awash west	East Shewa	Reserve	178,100
7	Galema-Boruluk	Arsi	Controlled Hunting area (CHA)	Not Available (N. A)
8	Munesa-Kuke	Arsi	CHA	N. A.
9	Aluto	East Shewa	CHA	N. A.
10	Dindin	West Harerge	CHA	N. A.
11	Arba Gugu	W. Harerge	CHA	N. A.
12	Jibat	West Shewa	CHA	N. A.
13	Choman	East Wellega	CHA	N. A.
14	Dedessa	East Wellega	CHA	N. A.
15	Kaka	Arsi	CHA	N. A.

Serial No.	Name of the Forest	Zonal Location	Area in hectares
1	Komtoo-waachaa-Tsigee	E. Walaggaa	077
2	Koonchii	E. Walaggaa	63000
3	Cad-sangil-Daangab	E. Walaggaa	44860
4	Joorgoo-Waatoo	W. Walaggaa	20000
5	Jeergeedaa	W. Walaggaa	137000
6	Garba Dimma	Ilii-abba-Bor	165000
7	Siibo-Tooli-Qoboo	Iluu-abba-Bor	100000
8	Yaayoo	Illuu-abba-Bor	130000
9	Sigmoo-Gabaa	Iluu-abba-Bor	280000
10	Balaxee-Geeraa	Jimma	174000
11	Baabiyyaa-Foolaa	Jimma	74000
12	Abaltii Gibee	Jimma	10000
13	Xiiroo-Botor	Jimma	85000
14	Jiibat	W. Shewa	121000
15	Ciilimoo-Gajii	W. Shewa	22000
16	Geedoo	W. Shewa	10000
17	Mangashaa-Suubaa	W. Shewa	9000
18	Dire-Garbiichaa	E. Shewa	9629
19	Arba-Guuguu	Arsi	47725
20	Ciilaloo-gaalamaa	Arsi	22000
21	Muneesaa-Shashamanee	Arsi /E. Shewa	98000
22	Areeroo-Yabeeloo	Borena	40000
23	Boree	Borena	219100
24	Magaadaa	Borena	21000
25	Nagalee-Daawaa	Borena	17780
26	Anfaaararraa-Wadaraa	Borena	106568
27	Adaba-doodolaa	Bale	73000
28	Kubayuu	Bale	78444
29	Aluushee-baatuu	Bale	40000
30	Manaa-angeetuu	Bale	190000
31	Haaranaa-Kokoosaa	Bale	182000
32	Goroo-balee	Bale	10000

33	Dindiin	W. Harar	19000
34	Jalo-Muktar	W. Harar	21340
35	Jarsoo-Guursuum	E. Harar	52318
36	Garaa-Muula'ataa	E. Harar	7000
37	Dhangagoo-Hawalee	E. Harar	8431
38	Saalee-Noonnoo	Ilubabor	N. A.
39	Butijii-Marka-Jebdum	E. Harar	45188

Source:- **D. Wirtu (May 1994).**

	Common Name	Scientific Name
1	Baboon, anubis	<i>Papio anubis</i>
2	Baaboon, gelada	<i>Papio gelada</i>
3	Baboon, hamadryas	<i>Papio hamadryas</i>
4	Buffalo	<i>Syncerus caffer</i>
5	Bushbuck, common	<i>Tragelaphus scriptus</i>
6	Bushbuck, Menelik's	<i>Tragelaphus scriptus Meneliki</i>
7	Caracal	<i>Felis carcal</i>
8	Cat, Wild	<i>Felis silvestris</i>
9	Colobus, black & white	<i>Colobus guereza</i>
10	Dikdik, Gunther's	<i>Madoqua guentheri</i>
11	Dikdik, Salt's	<i>Madoqua saltiana</i>
12	Duiker, grey	<i>Sylvicapra grimmia</i>
13	Elephant	<i>Loxodonta africana</i>
14	Fox, bat-eared	<i>Otocyon megalotis</i>
15	Gazelle, Grant's	<i>Gazella granti</i>
16	Genet, common	<i>Genetta genetta</i>
17	Genet, rusty-spotted	<i>Genetta rubiginosa</i>
18	Gerenuk	<i>Litocranius walleri</i>
19	Hare, Abyssinian	<i>Lepus habessinicus</i>
20	Hippopotamus	<i>Hippopotamus amphibius</i>
21	Hog, giant forest	<i>Hylocherus meinertzhageni</i>
22	Hyaena, spotted	<i>Crocuta crocuta</i>
23	Jackal, black-backed	<i>Canis mesomelas</i>
24	Jackal, golden	<i>Canis aureus</i>
25	Jackal, side-striped	<i>Canis adustus</i>
26	Klipspringer	<i>Oreotragus oreotragus</i>
27	Kudu, greater	<i>Tragelaphus strepsiceros</i>
28	Kudu, lesser	<i>Tragelaphus imberbis</i>
29	Leopard	<i>Panthera pardus</i>
30	Lion	<i>Panthera leo</i>
31	Mongoose, Egyptian	<i>Herpestes ichneumon</i>
32	Mongoose, slender	<i>Herpestes sanguineus</i>
33	Mongoose, southern dwarf	<i>Helogale parvula</i>

34	Monkey, blue	<i>Cercopithecus mitis</i>
35	Monkey, grivet	<i>Cercopithecus aethiops</i>
36	Monkey, vervet	<i>Cercopithecus pygerythrus</i>
37	Nyala, mountain	<i>Tragelaphus buxtoni</i>
38	Oribi	<i>Ourebia ourebi</i>
39	Oryx	<i>Oryx gazella</i>
40	Ostrich	<i>Struthio camelus</i>
41	Pig, bush	<i>Potamochoerus porcus</i>
42	Porcupine	<i>Hystrix cristataq</i>
43	Ratel	<i>Mellivora capensis</i>
44	Reedbuck, bohor	<i>Redunca redunca</i>
45	Serval	<i>Felis serval</i>
46	Warthog	<i>Phacochoerus aethiopicus</i>
47	Waterbuck, defassa	<i>Kobus ellipsiprymnus</i>
48	Zorilla	<i>Ictonyx striatus</i>

No.	Common Name	Scientific Name
1	Dove, red-eyed	<i>Streptopelia semitorquata</i>
2	Dove, ring-necked	<i>Streptopelia capicola</i>
3	Duck, black	<i>Anas sparsa</i>
4	Duck, fulvous tree	<i>Dendrocygna bicolor</i>
5	Duck, gadwall	<i>Anas strepera</i>
6	Duck, garganey	<i>Anas querquedula</i>
7	Duck, maccoa	<i>Oxyura maccoa</i>
8	Duck, mallard	<i>Anas platyrhynchos</i>
9	Duck, pintail	<i>Anas acuta</i>
10	Duck, red-billed	<i>Anas erythrorhynchos</i>
11	Duck, shoveler	<i>Anas clypeata</i>
12	Duck, tufted	<i>Aythya fuligula</i>
13	Duck, white-backed	<i>Thalassornis leuconotus</i>
14	Duck, white-faced tree	<i>Dendrocygna viduata</i>
15	Duck, yellow-billed	<i>Anas undulata</i>
16	Francolin, Archer's grey-wing	<i>Francolinus levaillantoides</i>
17	Francolin, chestnut-naped	<i>Francolinus castaneicollis</i>
18	Francolin, Clapperton's	<i>Francolinus clappertoni</i>
19	Francolin, coqui	<i>Francolinus coqui</i>
20	Francolin, crested	<i>Francolinus sephaena</i>
21	Francolin, Erckel's	<i>Francolinus erckelii</i>
22	Francolin, grey-wing	<i>Francolinus psilolaemus</i>
23	Francolin, scaly	<i>Francolinus squamatus</i>
24	Goose, Egyptian	<i>Alopochen aegytiacus</i>
25	Goose, knob-billed	<i>Sarkidiornis melanota</i>
26	Goose, spur-winged	<i>Plectropterus gambensis</i>
27	Guinea fowl, tufted	<i>Numida meleagris</i>
28	Partridge, sand	<i>Ammoperdi heyi</i>
29	Partridge, stone	<i>Ptilopachus petrosus</i>
30	Pigeon, speckled	<i>Columba guinea</i>
31	Pochard	<i>Aythya ferina</i>
32	Pochard, African	<i>Netta erythrophthalma</i>
33	Pochard, white-eyed	<i>Aythya ferina</i>

34	Quail, blue	<i>Coturnis chinensis</i>
35	Quail, European	<i>Coturnis coturnix</i>
36	Quail, harlequin	<i>Conturnix delegorguei</i>
37	Sandgrouse, black-faced	<i>Pterocles decoratus</i>
38	Sandgrouse, chestnut-bellied	<i>Pterocles exustus</i>
39	Sandgrouse, four-banded	<i>Pterocles quadricinctus</i>
40	Sandgrouse, Lichtenstein's	<i>Pterocles lichtensteini</i>
41	Sandgrouse, spotted	<i>Pterocles senegallus</i>
42	Sandgrouse, yellow-throated	<i>Pterocles gutturalis</i>
43	Snipe, common	<i>Gallinago gallinago</i>
44	Snipe, great	<i>Gallinago media</i>
45	Spurfowl, yellow-neck	<i>Francolinus leucoscepus</i>
46	Teal, common	<i>Anas crecca</i>
47	Teal, Hottentot	<i>Anas hottentota</i>
48	Wigeon	<i>Anas penelope</i>
49	Wigeon, cape	<i>Anas capensis</i>

S.No	Common Name	Scientific Name
1	Baboon, anubis	<i>Papio anubis</i>
2	Baboon, hamadryas	<i>Papio hamadryas</i>
3	Cat, wild	<i>Felis silverstris</i>
4	Colobus, black & white	<i>Colobus guereza</i>
5	Dikdik, Gunther's	<i>Madoqua guentheri</i>
6	Dikdik, Salt's	<i>Madoqua saltiana</i>
7	Duiker, grey	<i>Sylvicapra grimmia</i>
8	Fox, bat-eared	<i>Otocycon megalotis</i>
9	Genet, common	<i>Genetta genetta</i>
10	Genet, rusty-spotted	<i>Genetta rubiginosa</i>
11	Hare, Abyssinian	<i>Lepus habessinicus</i>
12	Hyaena, spotted	<i>Crocuta crocuta</i>
13	Jackal, black-backed	<i>Canis mesomelas</i>
14	Jackal, golden	<i>Canis aureus</i>
15	Jackal, side-striped	<i>Canis adustus</i>
16	Lion	<i>Panthera leo</i>
17	Mongoose, Egyptian	<i>Herpestes ichneumon</i>
18	Mongoose, slender	<i>Herpestes sanguineus</i>
19	Mongoose, southern dwarf	<i>Helogale parvula</i>
20	Monkey, grivet	<i>Cercopithecus aethiops</i>
21	Monkey, vervet	<i>Cercopithecus pygerythrus</i>
22	Pig, bush	<i>Potamochoerus porcus</i>
23	Procupine	<i>Hystrix cristata</i>
24	Ratel	<i>Mellivora capensis</i>
25	Warthog	<i>Phacochoerus aethiopicus</i>
26	Zorilla	<i>Ictonyx striatus</i>

Annex 8. LIVE-SALEABLE BIRDS OF OROMIA

No.	Common Name	Scientific Name
1	Avocet	<i>Recurvirosta avosetta</i>
2	Barbet, black-billed	<i>Lybius guifsobalito</i>
3	Barbet, double-toothed	<i>Lybius bidentatus</i>
4	Bee-eater, blue-breasted	<i>Merpos lafresnayii</i>
5	Bee-eater, carmine	<i>Merpos nubicus</i>
6	Bee-eater, European	<i>Merpos apiaster</i>
7	Bee-eater, white-throated	<i>Merpos albicollis</i>
8	Bishop, black-winged	<i>Euplectes hordeacea</i>
9	Bishop, West Nile red	<i>Euplectes franciscana</i>
10	Bishop, yellow	<i>Euplectes capensis</i>
11	Bishop, yellow-crowned	<i>Euplectes afer</i>
12	Bulbul, white-vented	<i>Pyconotus barabatus</i>
13	Cordon-bleu, red-cheeked	<i>Uraeginthus bengalus</i>
14	Cukoo, emerald	<i>Chrysococcyx cupreus</i>
15	Cukoo, didric	<i>Chrysococcyx caprius</i>
16	Cukoo, klass'	<i>Chrysococcyx klass</i>
17	Cut, throat	<i>Amadina fasciata</i>
18	Dove, black-billed wood	<i>Turtur abyssinicus</i>
19	Dove, blue-spotted wood	<i>Turtur afer</i>
20	Dove, emerald-spotted wood	<i>Tutur chaloospiles</i>
21	Dove, laughing	<i>Streptopelia Senegalensis</i>
22	Dove, lemon	<i>Apolopelia larvata</i>
23	Dove, mourning	<i>Streptopelia Oescapiens</i>
24	Dove, namaqua	<i>Oena capensis</i>
25	Dove, pink-breasted	<i>Streptopelia lugens</i>
26	Dove, pink-headed	<i>Streptopelia roseogrisea</i>
27	Dove, red-eyed	<i>Streptopelia Semitorquata</i>
28	Dove, ring-necked	<i>Streptopelia capicola</i>
29	Dove, tambourine	<i>Turtur typanistria</i>
30	Dove, turtle	<i>Streptopelia turtur</i>
31	Dove, vinaceous	<i>Streptopelia vinacea</i>
32	Duck, African black	<i>Anas sparsa</i>
33	Duck, fulvous tree	<i>Dendrocygna bicolor</i>

34	Duck, maccoa	<i>Oxyura maccoa</i>
35	Duck, red-billed	<i>Anas erythrorhynchos</i>
36	Duck, tufted	<i>Aythya fuligula</i>
37	Duck, white-backed	<i>Thalassaornis leuconotus</i>
38	Duck, white-faced tree	<i>Oeldrocygna viduata</i>
39	Duck, yellow-billed	<i>Anas undulata</i>
40	Firefinch, red-billed	<i>Logonosticta senegalus</i>
41	Fly catcher, paradise	<i>Terpsiphone viridis</i>
42	Francolin, chestnut-naped	<i>Francolinus castaneicollis</i>
43	Francolin, Clapperton's	<i>Francolinus clappertoni</i>
44	Francolin, coqui	<i>Francolinus coqui</i>
45	Francolin, crested	<i>Francolinus sephaena</i>
46	Francolin, Erckel's	<i>Francolinus erckelii</i>
47	Francolin, scaly	<i>Francolinus squamatus</i>
48	Fadwall	<i>Anas strepara</i>
49	Garganey	<i>Anas querquedula</i>
50	Grey-wing,	<i>Francolinus psildaemus</i>
51	Grey-wing, Archer's	<i>Francolinus levaillantoides</i>
52	Go-away-bird, bare-faced	<i>Corythaixoides personata</i>
53	Goose, Egyptian	<i>Alorochen aegyptiaca</i>
54	Goose, knob-billed	<i>Sarkidiornis melanota</i>
55	Goose, spur-winged	<i>Plectropterus gamebensis</i>
56	Grenardier, purple	<i>Uraeginthus ianthionogaster</i>
57	Guineafowl, tufted	<i>Numida meleagris</i>
58	Guineafowl, vulturine	<i>Acryllium vulturine</i>
59	Hoopoe, African	<i>Upupa eyeps</i>
60	Hornbill, red-billed	<i>Tockus erythrorhynchus</i>
61	Hornbill, silvery-cheeked	<i>Eycanistes brevis</i>
62	Hornbill, von der Decken's	<i>Tockus deckeni</i>
63	Ibis, sacred	<i>Plegadis falcinellus</i>
64	Jacana, African	<i>Actophilornis africana</i>
65	Kingfisher, giant	<i>Ceryle maxima</i>
66	Kingfisher, grey-headed	<i>Halcyon laucocephala</i>
67	Kingfisher, malachite	<i>Aloedo cristata</i>
68	Kingfisher, pied	<i>Ceryle rudis</i>

69	Kingfisher, woodland	<i>Halcyon senegalensis</i>
70	Mallard	<i>Anas platyrhynchos</i>
71	Mannikin, bronze	<i>Lonchura culcullata</i>
72	Mouse-bird, blue-naped	<i>Colius macrourus</i>
73	Oriole, black-headed	<i>Oriolus larvatus</i>
74	Parrot, orange-bellied	<i>Tauraco leucotis</i>
75	Partridge, sand	<i>Anoperis heyi</i>
76	Partridge, stone	<i>Ptilopachus petrosus</i>
77	Pigeon, Bruce's green	<i>Treron waalia</i>
78	Pigeon, green	<i>Treron australis</i>
79	Pigeon, olive	<i>Columba arguatrix</i>
80	Pigeon, rock	<i>Columba livia</i>
81	Pigeon, Speckled	<i>Columba guinea</i>
82	Pintail	<i>Anas acuta</i>
83	Plover, spur-winged	<i>Vanellus spinosus</i>
84	Pochard	<i>Aythya ferina</i>
85	Pochard, African	<i>Netta erythrophthalma</i>
86	Pochard, white-eyed	<i>Aythya nyroca</i>
87	Quail, blue	<i>Coturnix chinensis</i>
88	Quail, European	<i>Coturnix coturnix</i>
89	Quail, harlequin	<i>Coturnix delegorguei</i>
90	Roller, Abyssinian	<i>Coracias abyssinica</i>
91	Roller, Lilac-breasted	<i>Coracias caudta</i>
92	Sandgrouse, black-faced	<i>Pterocles decoratus</i>
93	Sandgrouse, chestnut-bellied	<i>Pterocles exustus</i>
94	Sandgrouse, four-banded	<i>Pterocles quadricinctus</i>
95	Sandgrouse, Lichtenstein's	<i>Pterocles lichtensteinii</i>
96	Sandgrouse, spotted	<i>Pterocles senegalus</i>
97	Sandgrouse, yellow-throated	<i>Pterocles gutturalis</i>
98	Shoveler	<i>Anas clypeata</i>
99	Shoveler, cape	<i>Anas smithii</i>
100	Shrike, grey-backed fiscal	<i>Lanius excubitorius</i>
101	Shrike, fiscal	<i>Lanius collaris</i>
102	Sparrow, grey-headed	<i>Passer griseus</i>
103	Sparrow, Swainson's	<i>Passer swainsonii</i>

104	Sparrow-weaver, stripe-breasted	<i>Plocepasser mahali</i>
105	Spurfowl, yellow-necked	<i>Francolinus leucoscepus</i>
106	Starling, blue-eared glossy	<i>Lamprotonis chalybaeus</i>
107	Starling, Ruppell's long-tailed	<i>Lamprotpnis purpuropterus</i>
108	Starling, superb	<i>Spero superbus</i>
109	Starling, violet-backed	<i>Cinnyricinclus leogester</i>
110	Starling, wattled	<i>Creatophora cinerea</i>
111	Stilt, black-winged	<i>Hinantopus hinantopus</i>
112	Sunbird, beautiful	<i>Nectarinia pulchella</i>
113	Sunbird, scarlet-chested	<i>Nectarinia senegalensis</i>
114	Sunbird, Tacazze	<i>Nectarinia tacazze</i>
115	Sunbird, variable	<i>Nectarinia venusta</i>
116	Teal, common	<i>Anas crecca</i>
117	Teal, hottentot	<i>Anas hottentota</i>
118	Turaco, white-cheeked	<i>Tauraco leucotis</i>
119	Waxbill	<i>Estrida astrild</i>
120	Waxbill, crimson-rumped	<i>Estrida rhodopyga</i>
121	Waxbill, yellow-billed	<i>Estrida melanotis</i>
122	Weaver, Baglafaecht	<i>Ploceus baglafaecht</i>
123	Weaver, black-headed	<i>Ploceus cucullatus</i>
124	Weaver, Ruppell's	<i>Ploceus galbula</i>
125	Weaver, masked	<i>Ploceus intermedius</i>
126	White-eye, white-breasted	<i>Zosterops abyssinica</i>
127	Widow-bird, fan-tailed	<i>Euplectes axillaris</i>
128	Widow-bird, yellow shouldered	<i>Euplectes macrourus</i>
129	Wigeon	<i>Anas penelope</i>
130	Wigeon, cape	<i>Anas capeisis</i>
131	Woodpecker, grey	<i>Mesopicos goertae</i>
132	Woodpecker, Nubian	<i>Campethera nubica</i>

1 . Project title – Ecosystems conservation in Oromia

2 . Background - The action programmes for the conservation of ecosystems in Oromia listed under chapter 8 may fall under two categories, namely, the ones that require the concerted efforts of different ministries and bureaux such as the control of population growth , mitigation of rural poverty, improvement of farming systems and the ones that directly come under the mandate of the Agricultural Bureau of Oromia such as survey of under-represented ecosystems, development of participatory ecosystems management , allocation of funds, capacity building, promotion of awareness, improvement of database, planning for the conservation areas and the legalization of protected areas.

The focus of this project profile is on the cost implication of those activities that are the responsibilities of the Agricultural Bureau of Oromia .

3 . Project objectives - Efforts to conserve ecosystems in Oromia, though incomplete and not very successful as elsewhere in this country, has been going on for several years. This effort that pursued the principle of keeping out human interests except tourism out of the principal protected area categories (national parks and wildlife sanctuaries) was not very successful as one witnesses the magnitude of human occupancy and activities in the national parks and sanctuaries. In addition to the faulty principle of developing the principal protected areas by excluding the human interests except tourism, the focus on conservation since the early 1960's when the idea of establishing national parks and other categories of protected areas emerged in this country to the present has been on the areas that possessed mega faunas of touristic values.

Conservation efforts in Oromia and elsewhere at global level which are not holistic and participatory have not been very successful.

Hence, objectives for ecosystems conservation in Oromia should be to conserve Oromia's biodiversity both inside and outside protected areas in a holistic fashion based on the principle of active participation of the communities that co-exist affecting and being affected by the ecosystems.

4. Duration of the project – The project with its components to make it comprehensive should be for a period of five years beginning from 1999 and carried out simultaneously where the condition permits.

5. Project Activities- During the project life a series of activities shall be carried out simultaneously when the opportunity allows.

There are some areas in Oromia that require surveys to establish protected areas. The short grasslands of Borana where the endemic larks occur, the upper Wabi-Shebelle gorge where the Gelada Baboon inhabits at Indeltu as its southern distribution limit and the broad –leafed forests of south west Oromia are among areas worthy to carry out surveys.

There are some protected areas in Oromia that have management plans which are shelved and outdated. These are the management plans of Awash National park, the Bale Mts National park and the Sankalle Swayne’s Hartebeestes sanctuary. The Yabello Wildlife Sanctuary and the Babille Elephants Sanctuary had never have any management plans.

Hence , it is required to draw up management plans for the aforesaid protected areas in order to properly conserve them.

In order to introduce active participatory resource management in areas where protected areas are, Socio –economic surveys should be carried out. This is to understand the impacts of communities on the natural resources and vice –versa.

This activity shall assist the Bureau to identify the necessary measures to implement joint management of the resources with the local communities.

The infrastructure of the existing protected areas are either not adequate or absent . There is no one protected area that has all –weather road, for example . The residential buildings are never adequate. Touristic facilities such as education centres, camping sites, picnic sites and nature trails are either absent or rudimentary. As a result of this the project is expected to upgrade the infrastructure of the existing protected areas.

The other sphere of activity is the establishment of a database which is deficient at present but very important.

Promotion of ecosystems conservation awareness among the people of the region is an activity that requires serious attention. In the absence of the support of the community , the protection of a free ranging resource such as the wildlife is never attainable. This planned awareness creation should be not only through teaching but must be also exhibited through materializing the benefit sharing philosophy which mostly remains on paper.

The Oromia Bureau of Agriculture at present has some five people who have wildlife management training at post - graduate and diploma levels. This is very far from enough both in quality and quantity. Hence , the project shall attempt to alleviate this problem by providing training to the staff of the Bureau during its life.

The need to strengthen the material resources of protected areas through purchases of machineries and equipment is another activity that the project attends to . The protected areas in Oromia, like elsewhere in the country, are poorly equipped with essential materials such as earth moving machineries, trucks, vehicles, electronic materials and camping gears.

The cost implication for the project activities discussed above is given in the table below

Serial No	Activities	Costs in Birr ('000)
1	Surveying of under --- represented ecosystems	400
2	Preparation of management plans for the principal conservation areas	600
3	Socio – economic surveys to identify the impacts of protected areas on the communities and the mechanisms to develop participatory resource conservation	800
4	Upgrading of the infrastructure of existing protected areas	10,000
5	Establishment of database	500
6	Promotion of awareness	300
7	Training of staff in the fields of ecosystems management	1,000
8	Purchase of machineries and equipment	2,000
	Total in birr	15,600

CHAPTER 9 INSTITUTION: ACTION PROGRAM

A. Objectives

B. Organisation and Management

(i) Primary Orientation and Training

In programmes like OFAP, where full participation of beneficiaries is to be involved all the way from planning and resource mobilisation to execution and monitoring and evaluation, popular education on the various aspects is indispensable to the target groups and all supportive and active parties. Hence a series of continual workshops, seminars and continuous training is necessary on different issues, as follows:

Workshops on principles of Forestry and Environment Protection to regional officials and line executives at different times for different levels - participation, democracy etc. Workshops on Forest management and organization to target groups and the various actors, culminating in election of Wereda Board Directors and Kebele officers, Workshops of orientation to board directors and officers at all levels on OFAP planning and execution such as: budget preparation, accounting, dual control and signature, reporting, monitoring and evaluation, project steering etc.

Mass orientation to beneficiary gathering and crowds on natural resource conservation, forest plantation, protection problems of over population and its control, observation of the rights of women etc. After all it is from this source that the biggest work force will be provided.

Establishment of a vocational training centre at a regional level.

The workshops, seminars, training programmes and collective conferences should not only enlighten and enable OFAP execution but also:

1. Raises local confidence in self support

2. Helps mobilise local human, material, and indigenous know-how.
3. Facilitates co-ordination with government structures of rural development, parastatal organisations and donor agencies, formal and informal peasant organisations and groupings.
4. Contributes to sustainability of OFAP

(ii) Organisation

Whereas co-ordination of programme for the 180 weredas is necessary, a regional and zonal offices have not been recommended as co-ordination work at those levels with the donor agencies, the government centres, the national EFAP co-ordinating office established at the federal level and the general coordination of OFAP can be entrusted with the Forestry Department of the BoA or a Bureau of Environment Protection, if one is established at the regional level and its teams operating at the zones.

2. The Wereda Office

At this level, we have a general conference of beneficiary representatives, above a board of directors, who would meet once a year, to make deliberations on major strategy and policy issues. All board members of the wereda co-ordination, all Kebele Co-ordinators of OFAP, Women and Youth representatives of all kebeles in the wereda can attend this conference. The conference will be chaired by Chairman of the Board of Directors of the wereda.

C. Institution Building Project (IBP)

(i) Description of Project

Objective

Enable the people of Oromia region, attain better living conditions through improved forestry output and environmental conservation.

Purpose (short-term objectives)

Assist the population organise wereda OFAP offices to facilitate implementation of the various forestry programs in the OFAP study.

Primary Activities

- Agreement is concluded between all stakeholders
- 55 Leading state, government officials, rural development organisations heads, department heads, sector bureau heads and team leaders are given a workshop on the study of OFAP, and the programmes proposed or ignored, to arrive at resolutions on each issue.
- At zonal level Chairmen of Weredas and PAs will be given orientation seminars, will pass resolutions on institutional issues, prioritise forestry development sites.
- Chairmen of PAs, cooperatives, WAs and YAs are given orientation seminars, prioritize forestry sites, chart out mobilization and coordination work, elect wereda board members, approve Articles of Association and set future dates of general conference
- Offices designated by the state are taken over by wereda coordination office.
- Staff is recruited at all levels as per boxes of chart of organization above.
- Office, transport and utilisation equipment are provided by donors.
- Conduct Kebele orientation programmes and get officers elected.

Assumptions

The project assumes that:

- Regional interest in OFAP will continue unabated
- Qualified co-ordinators are provided by the region or central government.
- Provision of equipment and means is made on time by the donor

(ii) Budget

OFAP Consolidated Wereda Project - (OCWP) Br 16,836,600

The study has recommended a 20-year budget for the proposed wereda-level OFAP Project, and includes Wereda staff salaries, Kebele incentives - taking an average of 20 kebeles pr wereda, their official travel. Other items include remuneration and per diem and transportation of international and local consultants including UNVS. The project budget includes consumable and fixed equipment. See appendix.

Human Resource Development Project (HRDP-1)

Training of Forestry Development Agents - Br 2, 548,800.00

This study is of the opinion that agricultural development agents can handle a forestry package only for agro-forestry, as this has to go hand in hand with other mixed agriculture. However, with respect to state, communal and private forestry their site, purpose and activity are all different and therefore, require their own development agents. Hence, a production of 36 agents every six months has been envisaged for 20 years (i.e. until every wereda has eight forestry DAs), at the following costs. The cost has been determined at Br. 1,770.00 per trainee, in line with the training cost planned currently by the Botter-Becho training centre.

Human Resource Development Project (HRDP -2)

Fellowship and Group Training Project - Br 75,600,000.00

The table in the appendix shows the expenses in US\$ for one year. The project will be on going upto the end of the next 20 years, bringing the total to \$10,800,000.00 or Br 75,600,000.00

Information Development Project (IDP-1)

Establishment of communication network and joining the Information Highway - Br 37,800,000.00

An establishment of an information and communication network for every wereda, hooking it to the Information Superhighway has been envisaged at a cost of US\$30,000.00. or Br 210,000.00 per wereda. The project will cover 10 weredas every year and will be over in 18 years' time, hence, involving the cost of $\text{Br } 210,000 * 10 * 18 = 37,800,000.00$ for the whole project.

Information Development Project (IDP-2)

Establishment of a Quarterly Forestry Bulletin at the Forestry Department - Br 1,210,000.00

This includes equipment and salary of a Publications Officer, a secretary and a messenger, for the next 20 years, and the cost of establishment of an Information Network. The Department would follow-up regional, national and international research outcome, print and distribute them and do the same with respect to feedback from weredas and other users. The department joins the Information Highway and is responsible for the follow-up and printing and distribution of every relevant item, back and forth. The Department Establishes Monthly Research Outcome and Feedback forms at Forestry Department.

Appendix A

Consolidated Wereda OFAP project Budget Extended for 20 years

(Br)

Personnel

Co-ordinator's office	No.	Salary/ Month/ person	Total 20 years	1st yr.
Wereda co-ordinator	1	1500	360000	18000
Dupty co ordinator	1	1300	312000	15600
Secretary	1	500	120000	6000
Office Messenger	2	200	96000	4800
Drivers	5	300	360000	18000
Guards	4	200	192000	9600
Cleaners	2	150	72000	3600
Gardener	1	200	48000	2400
Research officer	1	1500	360000	18000
Research Assistant	1	1200	288000	14400
PDA's Coordinator	1	1200	288000	14400
Ass. PDA coordinator	1	1000	240000	12000
Lodal Resource Mobilization Head	1	1000	240000	12000
Peasant Orientation and Agenda clerks	4	500	480000	24000
Forestry Exepert	1	1000	240000	12000
Wildlife Expert	1	1000	240000	12000
Training officer	1	1200	288000	14400
O.J.T. co-ordination clerk	1	500	120000	6000
Orientation and Publication clerk	1	500	120000	6000
Dam,Irrigation and water Allocation Head	1	1300	312000	15600
Civil Engineer	1	1200	288000	14400
Personnel Officer	1	800	192000	9600
Acts .clerk	1	500	120000	6000
Supply and Procurement Clerk	1	500	120000	6000
Cashier	2	800	348000	19200
Typist	1	300	72000	3600
Board of Director's Office				
Secretary	1	500	120000	6000
Audit and Inspection Head	1	1300	312000	15600
Auditors	4	800	768000	38400
Head, Monitoring and Evaluation	1	1300	312000	15600
M and F Officers	2	1000	480000	24000
Driver	1	300	72000	3600
Total Wereda Office	64	32850	8016000	400800
KEBELE OPERATIIVES	No.	Salary/Month/Person	Total/20 Years	Year1
Kebele Co-ordinators	20	100	480000	24000
D/Co-ordinators	20	50	240000	12000
M&E Officers	20	50	240000	12000
Resource Mobilstation Officers	20	50	240000	12000

Bookkeepers	20	50	240000	12000
Forestry Management officers	20	50	240000	12000
Training and orientation Officers	20	50	24000	12000
Subworeda Officers	20	50	24000	12000
Cashiers	20	50	24000	12000
Sub total	200	500	240000	120000
Grand Total for Whole Woreda	264	167600	10416000	520800

1. The figures include all kebeles of one woreda assuming an average of 20 kebeles per woreda. Thus nine Board members and one coordinator etc. are taken for each kebele . Hence the total for othe region can be obtaineec by multiplying by 180.
2. Amount is only incentive payable at woreda working office based on days of attendance as per expert's report.

Whereas it has been tried to depict the direction of an adequate institutional setup for forestry action programmes from the point of view of policies, objectives and legislation, and also management and organization, the training, research and extension aspects have also been assessedand recommendations proposed, in this phase of the study.

Inorder to be able to analyze current situation, and arrive at the conclusions provided, the EFAP and several other sutdies have been consulted and field trips made to both Eastern and Western Oromia. The appendisized questionnaire had been developed and utilized along with our observation in the field to unearth facts and figures for our detailed analysis and diagnosis in the different sections touched upon above. Recommendation for immediate rectification of constraints have been earmarked. The next phase will develop a programme and projects for institution Building, as part of the Oromia Forestry Action Programme (OFAP). Whereas other technical disciplines in OFAP, might have programs running upto twenty years, and perhaps more due to the nature of field, Institution Building being the infrastructure of it all, has to be set earlier than most activities and therefore concentrates on the five-year programme

2) PerDiem

Official Travel	No	Average Perdiem	No. of days	Total 20 years	year 1
Development Agents	200	20	100	8000000	400000
Woreda Staff	30	20	10	30000	6000
Kebele Officers	30	10	20	3000	6000
Consultative Donferences	100	10	1	5000	1000
Board Directors	8	10	12	4800	960
Sub total				84800	16960

1: Consultancy	No	Br(Month) Consultan t	Total/20 years	Year 1
11:01 Consultant fees	10	7000	700000	140000
11:02 NPP	10	2100	714000	252000
11:03 UNV personel (Salary)	1	4200	200000	50000
Sub total	21	13300	1614000	442000
12:00 Official Travel (perdiem at \$30/day/person				
12:01 Consultants \$30/day for 30 days	10	6300	315000	63000
12:02 NPP \$30 day/day for 30 dday	10	6300	182700	63000
12:03UNV \$30/day/for 30 days	1	6300	31500	6300
Sub total	21	18900	529200	132300

13:00 Transportation				
13:01 Consultants at 200 for two round trips	10		70000	14000
13:02 NPP	10		4600	14000
13:03 UNP Local TRavel	1		7000	1400
13:04 UNV International Travel	1		105000	21000
Sub total			222600	50400
4. Consumable and equipment (Br)				
Stationery	700000	7000		
General Supplies (cleaning Uniforms, other utilities	140000	7000		
Vehicle Fuel	140000	7000		
Others	140000	7000		
Sub Total	1120000	28000		
Fixed Equipment				
Furniture of Fixture	238000	210000		
Vehicle(4X4),Five	756000	700000		
Computers and Printers(5)	707000	700000		
Typewriters(10)	14000	14000		
Office building (25)	735000	700000		
General reserve	700000	-		
SubTotal	2850000	2450000		
Total-Consumable and Equipment	3970000	498300		

Human Resource Development Project (HRDP-1)

Whereas field studies showed that the existing capacity, equipment and curricula being developed for higher learning of forestry are adequate, human resources development projects have been recommended at other level, as follows:

Training of Forestry Development Agents - Br 2, 548,800.00

This study is of the opinion that agricultural development agents can handle a forestry package only for agro-forestry, as this has to go hand in hand with other mixed agriculture. However, with respect to state, communal and private forestry their site, purpose and activity are all different and therefore, require their own development agents. Hence, a production of 36 agents every wereda has eight forestry Das), at the following costs. The cost has been determined at Br. 1,770.00 per trainee, in line with the training cost planned currently by the Botter-Becho training center, to include courses such as:

<u>Item</u>	<u>Cost(Br.)</u>
Forestry Nursery Development	215.00
Plantation Forestry	215.00
Logging and Transport	224.00
Lumbering	159.00
Saw Mill Operating	93.00 etc.

Hence, the total cost would be $36 \times 177 \times 2 \times 20 = 2,548,800.00$ Br. For 20 years

Human Resource Development Project (HRDP -2)

Fellowship and Group Training Project - Br 75,600,000.00

The table shows the expenses in \$ for one year. The project will be on going up to the end of the next 20 years, bringing the total to \$10,800,000.00 or Br 75,600,000.00

TRAINING (INCLUDING TRAVELS)	No	Amt./Month/Person	Year 1
Fellowship	20	1,500	360,000
Study Tours (Abroad)	20	(\$,5000/Person/Year)	100,000
Study Tours (Within the country)	200	(\$300/Person)	60,000
Group Training			10,000
OJT			10,000
Total			540,000

Information Development Project (IDP-1)

Establishment of communication network and joining the Information Highway - Br 37,800,000.00

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Information Development Project (IDP-2)

Establishment of a Quarterly Forest Bulletin at Forestry Department - Br 1,210,000.00

This includes equipment and salary of a Publications Officer, a Secretary and a messenger, for the next 20 years, and the cost of establishment of an Information network. The Department would follow-up regional national and international research outcome, print and distribute them and do the same with respect to feedback from woredas and other users. The department joins the Information Highway and is responsible for the follow-up and printing and distribution of every relevant item, back and forth. The department Establishes Monthly Research Outcome and feedback forms at Forestry Department